# TEST REPORT

## EN 60950-1
## Information technology equipment – Safety – Part 1: General requirements

| | |
|---|---|
| **Report Number. ..... :** | CTK-2017-01749 |
| **Date of issue ..... :** | 2017-09-25 |
| **Total number of pages..... :** | 41 pages |
| **Applicant's name..... :** | "Neolainas" LTD |
| **Address ..... :** | Žalgirio g. 131, Vilnius, Lithuania, LT-09303 |
| **Test specification:** | |
| **Standard ..... :** | EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013 |
| **Test procedure ..... :** | CE (LVD) |
| **Non-standard test method ..... :** | N/A |
| **Test Report Form No. ..... :** | IEC60950_1F |
| **Test Report Form(s) Originator ..... :** | SGS Fimko Ltd |
| **Master TRF..... :** | Dated 2015-03 |
| **Modified Test Report Form No..... :** | CTK-RF-SC-IEC60950-1F |
| **TRF modified by ..... :** | CTK Co., Ltd. |



**General disclaimer:**

The test results presented in this report relate only to the object tested.
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| | |
|---|---|
| **Test item description .....** | CAR DVR |
| **Trade Mark .....** | NEOLINE |
| **Manufacturer .....** | CNSLink Co., Ltd<br>#3F,11, Banga-ro 16,Bundang-gu,Seongnam-si,Gyeonggi-do |
| **Model/Type reference .....** | G-tech X52, G-tech X53 |
| **Ratings .....** | Input : DC 12 V / 24 V⎓, 0.5 A |

| | | | |
|---|---|---|---|
| **Testing procedure and testing location:** | | | |
| ☒ | **Testing Laboratory**: | CTK Co., Ltd. | |
| **Testing location/ address .....:** | | (Ho-dong) 113, Yejik-ro, Cheoin-gu, Yongin-shi<br>Gyeonggi-do KOREA, REPUBLIC OF | |
| ☐ | **Associated Testing Laboratory:** | | |
| **Testing location/ address .....:** | | N/A | |
| **Tested by (name, function, signature).....:** | | JungKyu Yang,<br>Project handler |  |
| **Approved by (name, function, signature)...:** | | KwangWon Lee,<br>Reviewer |  |
| ☐ | **Testing procedure: TMP/CTF Stage 1:** | | |
| **Testing location/ address .....:** | | N/A | |
| **Tested by (name, function, signature).....:** | | N/A | |
| **Approved by (name, function, signature)...:** | | N/A | |
| ☐ | **Testing procedure: WMT/CTF Stage 2:** | | |
| **Testing location/ address .....:** | | N/A | |
| **Tested by (name, function, signature).....:** | | N/A | |
| **Witnessed by (name, function, signature) .:** | | N/A | |
| **Approved by (name, function, signature)...:** | | N/A | |
| ☐ | **Testing procedure: SMT/CTF Stage 3 or 4:** | | |
| **Testing location/ address .....:** | | N/A | |
| **Tested by (name, function, signature).....:** | | N/A | |
| **Witnessed by (name, function, signature) .:** | | N/A | |
| **Approved by (name, function, signature)...:** | | N/A | |
| **Supervised by (name, function, signature) :** | | N/A | |

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

Attachment 1: 21 pages (European group differences (EN 60950-1:2006/A11:2009/A1:2010/A12:2011/A2:2013))

Attachment 2: 4 pages (Photographs)

**Summary of testing:**

| **Tests performed (name of test and test clause):** | **Testing location:** |
|---|---|
| All clause | CTK Co., Ltd.<br>(Ho-dong) 113, Yejik-ro, Cheoin-gu, Yongin-shi Gyeonggi-do KOREA, REPUBLIC OF |

**Summary of compliance with National Differences**

**List of countries addressed:** European group differences

☒ **The product fulfils the requirements of the standard EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013**

**Copy of marking plate**




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| | |
|---|---|
| **Test item particulars..... :** | |
| **Equipment mobility..... :** | [X] movable [] hand-held [] transportable<br>[] 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>[X] other: Class III |
| **Mains supply tolerance (%) or absolute mains supply values ..... :** | N/A |
| **Tested for IT power systems ..... :** | [] Yes [X] No |
| **IT testing, phase-phase voltage (V) ..... :** | N/A |
| **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) ..... :** | N/A |
| **Pollution degree (PD) ..... :** | [] PD 1 [X] PD 2 [] PD 3 |
| **IP protection class ..... :** | IP X0 |
| **Altitude during operation (m) ..... :** | Up to 2 000 m |
| **Altitude of test laboratory (m) ..... :** | 180 m |
| **Mass of equipment (kg) ..... :** | 0.30 kg |
| **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 .....:** | 2017-08-31 |
| **Date(s) of performance of tests.....:** | 2017-09-01 to 2017-09-22 |

**General remarks:**

"(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.**

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

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| | |
|---|---|
| The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided ..... : | ☐ Yes<br>☒ Not applicable |
| **When differences exist; they shall be identified in the General product information section.** | |
| **Name and address of factory (ies) ..... :** | J-TECHNOLOGY Co.,LTD.<br>#293-15 Gongdan-2Dong,Gumi-City,Gyeong-Buk, Korea |

**General product information:**

1. This product is CAR DVR
2. Maximum Specified ambient temperature is 70 °C.
3. The equipment is a Class lll construction.
4. User's manual is provided.
5. The model G-tech X53 are identical to basic model G-tech X52 except for model designation

**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)

| EN 60950-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **1** | **GENERAL** | | P |
| **1.5** | **Components** | | P |
| 1.5.1 | General | | P |
| | Comply with EN 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. Components not certified are used in accordance with their ratings and they comply with applicable parts of EN 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 EN 60950-1. | P |
| 1.5.3 | Thermal controls | No thermal controls | N/A |
| 1.5.4 | Transformers | | 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 |

| EN 60950-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **1.6** | **Power interface** | | P |
| 1.6.1 | AC power distribution systems | Class III equipment | P |
| 1.6.2 | Input current | (see appended table 1.6.2) | P |
| 1.6.3 | Voltage limit of hand-held equipment | Not a hand-held unit. | N/A |
| 1.6.4 | Neutral conductor | Neutral conductor is insulated from earth by basic insulation | N/A |
| **1.7** | **Marking and instructions** | | P |
| 1.7.1 | Power rating and identification markings | (see copy of marking plates) | P |
| 1.7.1.1 | Power rating marking | Power rating marking is located on the outside surface of the equipment. | P |
| | Multiple mains supply connections .....: | No multiple mains | N/A |
| | Rated voltage(s) or voltage range(s) (V) .....: | DC 12 V - 24 V ⎓ | P |
| | Symbol for nature of supply, for d.c. only .....: | DC symbol (⎓) was provided (according to 60417 No. 5031 provided on the mar king label.) | P |
| | Rated frequency or rated frequency range (Hz) ...: | Class III equipment | N/A |
| | Rated current (mA or A) .....: | 0.5 A | P |
| 1.7.1.2 | Identification markings | | P |
| | Manufacturer's name or trade-mark or identification mark .....: | (see copy of marking plates) | P |
| | Model identification or type reference .....: | (see copy of marking plates) | P |
| | Symbol for Class II equipment only .....: | Class III equipment | N/A |
| | Other markings and symbols .....: | No markings and symbols give rise to misunderstanding. (see copy of marking plates) | P |
| 1.7.1.3 | Use of graphical symbols | . | P |
| 1.7.2 | Safety instructions and marking | | N/A |
| 1.7.2.1 | General | | N/A |
| 1.7.2.2 | Disconnect devices | No disconnect device is nece ssary (Class III equipment) | 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 | No operator access area with a tool | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 1.7.2.6 | Ozone | The equipment under test does not produce ozone. | N/A |
| 1.7.3 | Short duty cycles | Continuous operation | N/A |
| 1.7.4 | Supply voltage adjustment ..... : | No voltage adjustment | N/A |
| | Methods and means of adjustment; reference to installation instructions ..... : | | N/A |
| 1.7.5 | Power outlets on the equipment ..... : | No power outlets on the equipment | N/A |
| 1.7.6 | Fuse identification (marking, special fusing characteristics, cross-reference) ..... : | | N/A |
| 1.7.7 | Wiring terminals | | N/A |
| 1.7.7.1 | Protective earthing and bonding terminals ..... : | No protective earthing and bo nding terminals | N/A |
| 1.7.7.2 | Terminals for a.c. mains supply conductors | No terminals for a.c. mains supply conductors | N/A |
| 1.7.7.3 | Terminals for d.c. mains supply conductors | | N/A |
| 1.7.8 | Controls and indicators | | N/A |
| 1.7.8.1 | Identification, location and marking ..... : | | N/A |
| 1.7.8.2 | Colours ..... : | | N/A |
| 1.7.8.3 | Symbols according to IEC 60417 ..... : | | N/A |
| 1.7.8.4 | Markings using figures ..... : | No Markings using figures | N/A |
| 1.7.9 | Isolation of multiple power sources ..... : | No multiple power sources | N/A |
| 1.7.10 | Thermostats and other regulating devices ..... : | No thermostats and other regulating devices | N/A |
| 1.7.11 | Durability | Rubbing the marking by hand for 15s with a piece of cloth soaked with water and petroleum spirit. After this test, the marking is still legible. | P |
| 1.7.12 | Removable parts | No marking on removable parts. | P |
| 1.7.13 | Replaceable batteries ..... : | No replaceable batteries | N/A |
| | Language(s) ..... : | | — |
| 1.7.14 | Equipment for restricted access locations ..... : | | N/A |

| | | |
|---|---|---|
| **2** | **PROTECTION FROM HAZARDS** | N/A |

| | | |
|---|---|---|
| **2.1** | **Protection from electric shock and energy hazards** | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 2.1.1 | Protection in operator access areas | Class III equipment (supplied from SELV circuit) | N/A |
| 2.1.1.1 | Access to energized parts | | N/A |
| | Test by inspection .....: | Supplied by Non-energy hazardous and SELV | N/A |
| | Test with test finger (Figure 2A) .....: | | N/A |
| | Test with test pin (Figure 2B) .....: | | N/A |
| | Test with test probe (Figure 2C) .....: | No TNV | N/A |
| 2.1.1.2 | Battery compartments | No battery compartments | N/A |
| 2.1.1.3 | Access to ELV wiring | | N/A |
| | Working voltage (Vpeak or Vrms); minimum distance through insulation (mm) | | — |
| 2.1.1.4 | Access to hazardous voltage circuit wiring | Class III equipment (supplied from SELV circuit) | N/A |
| 2.1.1.5 | Energy hazards .....: | | N/A |
| 2.1.1.6 | Manual controls | No manual controls | N/A |
| 2.1.1.7 | Discharge of capacitors in equipment | Class III equipment | N/A |
| | Measured voltage (V); time-constant (s).....: | | — |
| 2.1.1.8 | Energy hazards – d.c. 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 .....: | | P |
| 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 | Class III equipment (supplied from SELV circuit) | P |
| 2.2.2 | Voltages under normal conditions (V) .....: | | N/A |
| 2.2.3 | Voltages under fault conditions (V) .....: | | N/A |
| 2.2.4 | Connection of SELV circuits to other circuits .....: | SELV connected to SELV only | P |

| | | | |
|---|---|---|---|
| **2.3** | **TNV circuits** | | N/A |
| 2.3.1 | Limits | No TNV circuit | N/A |
| | Type of TNV circuits.....: | | — |

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| EN 60950-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 2.3.2 | Separation from other circuits and from accessible parts | | N/A |
| 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 | No hazardous voltage in the equipment. | N/A |
| | Insulation employed ..... : | | — |
| 2.3.4 | Connection of TNV circuits to other circuits | No 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 | Class III equipment | 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 or IC current limiter, limits output under normal operating and single fault condition | | N/A |
| | Use of integrated circuit (IC) current limiters | | — |
| | d) Overcurrent protective device limited output | | N/A |
| | Max. output voltage (V), max. output current (A), max. apparent power (VA) ..... : | | — |
| | Current rating of overcurrent protective device (A) : | | — |
| **2.6** | **Provisions for earthing and bonding** | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 2.6.1 | Protective earthing | Class III equipment | N/A |
| 2.6.2 | Functional earthing | | N/A |
| | Use of symbol for functional earthing .....: | | N/A |
| 2.6.3 | Protective earthing and protective bonding conductors | | N/A |
| 2.6.3.1 | General | | N/A |
| 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 |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Instructions when protection relies on building installation | | N/A |
| 2.7.2 | Faults not simulated in 5.3.7 | | N/A |
| 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 |
| **2.8** | **Safety interlocks** | | N/A |
| 2.8.1 | General principles | No safety interlocks | 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 | | N/A |
| 2.9.2 | Humidity conditioning | | N/A |
| | Relative humidity (%), temperature (°C) .....: | | — |
| 2.9.3 | Grade of insulation | Functional Insulation only.. | P |
| 2.9.4 | Separation from hazardous voltages | | N/A |
| | Method(s) used .....: | | — |
| **2.10** | **Clearances, creepage distances and distances through insulation** | | N/A |
| 2.10.1 | General | Class III supplied by SELV | N/A |
| 2.10.1.1 | Frequency .....: | | N/A |
| 2.10.1.2 | Pollution degrees .....: | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 2.10.1.3 | Reduced values for functional insulation | | N/A |
| 2.10.1.4 | Intervening unconnected conductive parts | | N/A |
| 2.10.1.5 | Insulation with varying dimensions | | N/A |
| 2.10.1.6 | Special separation requirements | | N/A |
| 2.10.1.7 | Insulation in circuits generating starting pulses | | N/A |
| 2.10.2 | Determination of working voltage | | N/A |
| 2.10.2.1 | General | | N/A |
| 2.10.2.2 | RMS working voltage | | N/A |
| 2.10.2.3 | Peak working voltage | | N/A |
| 2.10.3 | Clearances | | N/A |
| 2.10.3.1 | General | Functional insulation only | N/A |
| 2.10.3.2 | Mains transient voltages | | N/A |
| | a) AC mains supply .....: | | N/A |
| | b) Earthed d.c. mains supplies .....: | | N/A |
| | c) Unearthed d.c. mains supplies .....: | | 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 .....: | | N/A |
| 2.10.3.7 | Transients from d.c. mains supply .....: | | N/A |
| 2.10.3.8 | Transients from telecommunication networks and cable distribution systems .....: | | N/A |
| 2.10.3.9 | Measurement of transient voltage levels | | 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 |
| 2.10.4 | Creepage distances | | P |
| 2.10.4.1 | General | Functional insulation only | P |
| 2.10.4.2 | Material group and comparative tracking index | | N/A |
| | CTI tests .....: | | — |
| 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 |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 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 | | 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 | | 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 | | N/A |
| | Electric strength test | | — |
| | Routine test | | N/A |
| 2.10.5.14 | Additional insulation in wound components | | 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 | | N/A |
| 2.10.6.1 | Uncoated printed boards | | N/A |
| 2.10.6.2 | Coated printed boards | | N/A |
| 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 |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 2.10.7 | Component external terminations | | N/A |
| 2.10.8 | Tests on coated printed boards and coated components | | 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 | | P |
| 3.1.2 | Protection against mechanical damage | Wireways are smooth and Free from sharp edges | P |
| 3.1.3 | Securing of internal wiring | Internal wirings are secured against excessive strain, loosening of terminals and damage to the conductor insulation | P |
| 3.1.4 | Insulation of conductors | | N/A |
| 3.1.5 | Beads and ceramic insulators | | N/A |
| 3.1.6 | Screws for electrical contact pressure | | N/A |
| 3.1.7 | Insulating materials in electrical connections | | N/A |
| 3.1.8 | Self-tapping and spaced thread screws | | N/A |
| 3.1.9 | Termination of conductors | The conductors are reliably fixed on the PCB | P |
| | 10 N pull test | No damaged | P |
| 3.1.10 | Sleeving on wiring | | N/A |
| **3.2** | **Connection to a mains supply** | | N/A |
| 3.2.1 | Means of connection | not directly connected to the mains | N/A |
| 3.2.1.1 | Connection to an a.c. mains supply | | N/A |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| 3.2.1.2 | Connection to a d.c. mains supply | | N/A |
| 3.2.2 | Multiple supply connections | | N/A |
| 3.2.3 | Permanently connected equipment | No permanently connected equipment | N/A |
| | Number of conductors, diameter of cable and conduits (mm) .....: | | — |
| 3.2.4 | Appliance inlets | | P |
| 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 | | N/A |
| 3.2.6 | Cord anchorages and strain relief | | N/A |
| | Mass of equipment (kg), pull (N) .....: | | — |
| | Longitudinal displacement (mm) .....: | | — |
| 3.2.7 | Protection against mechanical damage | | N/A |
| 3.2.8 | Cord guards | | N/A |
| | Diameter or minor dimension D (mm); test mass (g) .....: | | — |
| | Radius of curvature of cord (mm) .....: | | — |
| 3.2.9 | Supply wiring space | | N/A |
| **3.3** | **Wiring terminals for connection of external conductors** | | N/A |
| 3.3.1 | Wiring terminals | | 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 |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **3.4** | **Disconnection from the mains supply** | | N/A |
| 3.4.1 | General requirement | | N/A |
| 3.4.2 | Disconnect devices | | 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 | No three-phase equipment | N/A |
| 3.4.8 | Switches as disconnect devices | No three-phase equipment | 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 | | N/A |
| 3.5.2 | Types of interconnection circuits .....: | SELV circuit only | P |
| 3.5.3 | ELV circuits as interconnection circuits | No ELV interconnection circuit | N/A |
| 3.5.4 | Data ports for additional equipment | | N/A |
| **4** | **PHYSICAL REQUIREMENTS** | | P |
| **4.1** | **Stability** | | N/A |
| | Angle of 10° | This equipment is not floor standing equipment | N/A |
| | Test force (N) .....: | | N/A |
| **4.2** | **Mechanical strength** | | N/A |
| 4.2.1 | General | SELV circuit only | N/A |
| | Rack-mounted equipment. | | N/A |
| 4.2.2 | Steady force test, 10 N | | N/A |
| 4.2.3 | Steady force test, 30 N | | N/A |
| 4.2.4 | Steady force test, 250 N | | N/A |
| 4.2.5 | Impact test | | N/A |
| | Fall test | | N/A |
| | Swing test | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 4.2.6 | Drop test; height (mm) .....: | | N/A |
| 4.2.7 | Stress relief test | | N/A |
| 4.2.8 | Cathode ray tubes | No cathode ray tubes | N/A |
| | Picture tube separately certified .....: | | N/A |
| 4.2.9 | High pressure lamps | No high pressure lamps | N/A |
| 4.2.10 | Wall or ceiling mounted equipment; force (N) .....: | | N/A |
| **4.3** | **Design and construction** | | P |
| 4.3.1 | Edges and corners | In equipment edge and corner is composed of rounded and smoothed | P |
| 4.3.2 | Handles and manual controls; force (N).....: | | N/A |
| 4.3.3 | Adjustable controls | | N/A |
| 4.3.4 | Securing of parts | | P |
| 4.3.5 | Connection by plugs and sockets | | N/A |
| 4.3.6 | Direct plug-in equipment | | N/A |
| | Torque .....: | | — |
| | Compliance with the relevant mains plug standard .....: | | N/A |
| 4.3.7 | Heating elements in earthed equipment | | N/A |
| 4.3.8 | Batteries | | P |
| | - Overcharging of a rechargeable battery | (see appended table 4.3.8) | P |
| | - Unintentional charging of a non-rechargeable battery | | N/A |
| | - Reverse charging of a rechargeable battery | (see appended table 4.3.8) | P |
| | - Excessive discharging rate for any battery | (see appended table 4.3.8) | P |
| 4.3.9 | Oil and grease | | N/A |
| 4.3.10 | Dust, powders, liquids and gases | | N/A |
| 4.3.11 | Containers for liquids or gases | | N/A |
| 4.3.12 | Flammable liquids .....: | | 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 | | N/A |
| | Measured radiation (pA/kg) .....: | | — |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | Measured high-voltage (kV) .....: | | — |
| | Measured focus voltage (kV) .....: | | — |
| | CRT markings .....: | | — |
| 4.3.13.3 | Effect of ultraviolet (UV) radiation on materials | | N/A |
| | Part, property, retention after test, flammability classification .....: | | N/A |
| 4.3.13.4 | Human exposure to ultraviolet (UV) radiation .....: | | N/A |
| 4.3.13.5 | Lasers (including laser diodes) and LEDs | | N/A |
| 4.3.13.5.1 | Lasers (including laser diodes) | | N/A |
| | Laser class .....: | | — |
| 4.3.13.5.2 | Light emitting diodes (LEDs) | Not using lasers and LEDs | N/A |
| 4.3.13.6 | Other types .....: | | N/A |
| **4.4** | **Protection against hazardous moving parts** | | N/A |
| 4.4.1 | General | | 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 | | P |
| 4.5.2 | Temperature tests | (see appended table 4.5) | P |
| | Normal load condition per Annex L .....: | L.7 | — |
| 4.5.3 | Temperature limits for materials | (see appended table 4.5) | P |
| 4.5.4 | Touch temperature limits | | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 4.5.5 | Resistance to abnormal heat .....: | | N/A |
| **4.6** | **Openings in enclosures** | | P |
| 4.6.1 | Top and side openings | | P |
| | Dimensions (mm) .....: | No openings | — |
| 4.6.2 | Bottoms of fire enclosures | | P |
| | Construction of the bottomm, dimensions (mm) ...: | No openings | — |
| 4.6.3 | Doors or covers in fire enclosures | | N/A |
| 4.6.4 | Openings in transportable equipment | | N/A |
| 4.6.4.1 | Constructional design measures | | N/A |
| | Dimensions (mm) .....: | | — |
| 4.6.4.2 | Evaluation measures for larger openings | | N/A |
| 4.6.4.3 | Use of metallized parts | | N/A |
| 4.6.5 | Adhesives for constructional purposes | | 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 | Supplied by Limited power source and mounted on Min. V-0 | N/A |
| | Method 1, selection and application of components wiring and materials | | N/A |
| | Method 2, application of all of simulated fault condition tests | | N/A |
| 4.7.2 | Conditions for a fire enclosure | | P |
| 4.7.2.1 | Parts requiring a fire enclosure | | P |
| 4.7.2.2 | Parts not requiring a fire enclosure | Circuit supplied by a limited power source complying with 2.5 and with components mounted on materials of Class V-1 or better. | P |
| 4.7.3 | Materials | | P |
| 4.7.3.1 | General | | P |
| 4.7.3.2 | Materials for fire enclosures | | 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 | All materials are mounded on PCB rated Min. V-1. | P |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| 4.7.3.5 | Materials for air filter assemblies | | N/A |
| 4.7.3.6 | Materials used in high-voltage components | | N/A |
| **5** | **ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS** | | P |
| **5.1** | **Touch current and protective conductor current** | | N/A |
| 5.1.1 | General | Class III equipment | N/A |
| 5.1.2 | Configuration of equipment under test (EUT) | | N/A |
| 5.1.2.1 | Single connection to an a.c. mains supply | | N/A |
| 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 | No telecommunication networks | 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 |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | b) EUT whose telecommunication ports have no reference to protective earth | | N/A |
| **5.2** | **Electric strength** | | N/A |
| 5.2.1 | General | Class III equipment | N/A |
| 5.2.2 | Test procedure | | N/A |
| **5.3** | **Abnormal operating and fault conditions** | | P |
| 5.3.1 | Protection against overload and abnormal operation | No hazard in the equipment | N/A |
| 5.3.2 | Motors | No motors | N/A |
| 5.3.3 | Transformers | Class III equipment | N/A |
| 5.3.4 | Functional insulation .....: | Functional insulation complies with the requirements (c) | P |
| 5.3.5 | Electromechanical components | No electromechanical components | N/A |
| 5.3.6 | Audio amplifiers in ITE .....: | | 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 | | P |
| 5.3.9.1 | During the tests | | P |
| 5.3.9.2 | After the tests | | N/A |
| **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 | No TNV circuit | 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 |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 6.2.1 | Separation requirements | No TNV circuit | 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 |
| 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 | | N/A |
| 7.4.3 | Impulse test | | 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 |

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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** | **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 |
| | 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** | No motors | N/A |
| | Position .....: | | — |
| | Manufacturer .....: | | — |
| | Type .....: | | — |
| | Rated values .....: | | — |
| **B.2** | **Test conditions** | | N/A |
| **B.3** | **Maximum temperatures** | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **B.4** | **Running overload test** | | 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** | | N/A |
| **B.9** | **Test for three-phase motors** | | 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 .....: | | — |
| | Manufacturer .....: | | — |
| | Type .....: | | — |
| | Rated values .....: | | — |
| | Method of protection .....: | | — |
| **C.1** | **Overload test** | | N/A |
| **C.2** | **Insulation** | | N/A |
| | Protection from displacement of windings .....: | | 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 |

| EN 60950-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **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 |
| **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 |

| EN 60950-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 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 | CAR DVR | P |
| **M** | **ANNEX M, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1)** | | N/A |
| 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 |

| EN 60950-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| N.2 | IEC 60065 impulse test generator | | N/A |
| **P** | **ANNEX P, NORMATIVE REFERENCES** | | — |
| **Q** | **ANNEX Q, Voltage dependent resistors (VDRs) (see 1.5.9.1)** | | N/A |
| | - Preferred climatic categories .....: | | N/A |
| | - Maximum continuous voltage .....: | | N/A |
| | - Combination pulse current .....: | | N/A |
| | Body of the VDR<br>Test according to IEC60695-11-5.....: | | N/A |
| | Body of the VDR.<br>Flammability class of material ( min V-1).....: | | 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 |
| | | | — |
| **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 |

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| EN 60950-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 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 | | 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 |
| CC.4 | Test program 3.....: | | N/A |
| CC.5 | Compliance.....: | | N/A |
| **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 |

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

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

| 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 CHEM LTD | AF312 | V-0<br>Min 1.5 mm, | UL 94<br>UL 746 | UL (E67171) |
| Line filter (L7) | Interchangeable | Interchangeable | Rated 6.8 uH<br>125 °C | EN 60950-1 | Tested in equipment |
| Lithium Coin Battery (BAT3) | SEIKO INSTRUMENTS INC MICRO ENERGY DIV | MS621FE | Max Charging Current: 300 mA<br>Max Charging Voltage: 3.4 V | UL 1642 | UL (MH15628) |
| Elec-Capacitor (C157, C158) | Interchangeable | Interchangeable | Max. 50 V,<br>Max. 470 uF<br>125 °C | EN 60950-1 | Tested in equipment |
| PCB | Interchangeable | Interchangeable | V-0,<br>Min. 130 °C | UL 796 | UL |
| supplementary information: | | | | | |

**[1]) Provided evidence ensures the agreed level of compliance. See OD-CB2039.**

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

| 1.5.1 | TABLE: Opto Electronic Devices | N/A |
|---|---|---|
| Manufacturer .....: | | |
| Type .....: | | |
| Separately tested .....: | | |
| Bridging insulation.....: | | |
| External creepage distance .....: | | |
| Internal creepage distance.....: | | |
| Distance through insulation.....: | | |
| Tested under the following conditions .....: | | |
| Input .....: | | |
| Output.....: | | |
| supplementary information | | |
| | | |

| 1.6.2 | TABLE: Electrical data (in normal conditions) | | | | | P |
|---|---|---|---|---|---|---|
| U (V) | I (A) | Irated (A) | P (W) | Fuse # | Ifuse (A) | Condition/status |
| 12 V.d.c | 0.41 | 0.5 | 4.8 | - | 0.41 | Max. Normal Load<br>(Continuous video recording) |
| 24 V.d.c | 0.21 | 0.5 | 5.1 | - | 0.21 | Max. Normal Load<br>(Continuous video recording) |
| 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: | | | | | |
| | | | | | |

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

| | | |
|---|---|---|
| **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.) |
|---|---|
| | |
| supplementary information: | |
| | |

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

| **2.5** | **TABLE: Limited power sources** | N/A |
|---|---|---|

Circuit output tested:

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

| Components | Test condition (Single fault) | Uoc (V) | $I_{sc}$ (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:

Certified Adapter used

| **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) |
|---|---|---|---|---|---|---|
| Functional: | | | | | | |
| | | | | | | |
| Basic/supplementary: | | | | | | |
| | | | | | | |
| Reinforced: | | | | | | |
| | | | | | | |

supplementary information:

Certified Adapter used

| **EN 60950-1** | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| **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: | | | | | |
| Certified Adapter used | | | | | |

| **4.3.8** | **TABLE: Batteries** | P |
|---|---|---|
| The tests of 4.3.8 are applicable only when appropriate battery data is not available | | P |
| Is it possible to install the battery in a reverse polarity position? | | N/A |

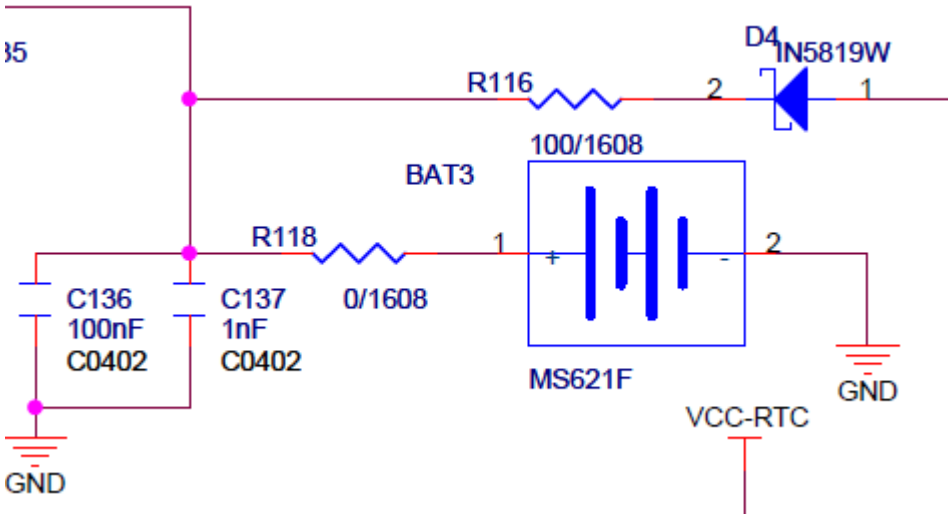
| | Non-rechargeable batteries | | | Rechargeable batteries | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Discharging | | Un-intentional charging | Charging | | Discharging | | Reversed charging | |
| | Meas. current | Manuf. Specs. | | Meas. current | Manuf. Specs. | Meas. current | Manuf. Specs. | Meas. current | Manuf. Specs. |
| Max. current during normal condition | - | - | - | 7 mA | 10 mA | 2 mA | 3 mA | - | - |
| Max. current during fault condition | - | - | - | 8 mA (R118 short, 7hr tested. No hazard) | - | 1 mA (R118 short, 7hr tested. No hazard) | - | - | - |

| Test results: | | Verdict |
|---|---|---|
| - Chemical leaks | No Chemical leaks | P |
| - Explosion of the battery | No Explosion | P |
| - Emission of flame or expulsion of molten metal | No emission | P |
| - Electric strength tests of equipment after completion of tests | | N/A |
| supplementary information: | | |
| | | |

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

| 4.3.8 | TABLE: Batteries | P |
|---|---|---|

| | |
|---|---|
| Battery category..... : | Lithium Rechargeable battery |
| Manufacturer..... : | Seiko Instruments Inc. |
| Type / model ..... : | MS621FE |
| Voltage..... : | 3.0 Vd.c. |
| Capacity..... : | 5.5 mAh |
| Tested and Certified by (incl. Ref. No.) ..... : | UL (MH15628) |
| Circuit protection diagram: | |




| MARKINGS AND INSTRUCTIONS (1.7.13 ) | |
|---|---|
| Location of replaceable battery | |
| Language(s) ..... : | |
| Close to the battery ..... : | |
| In the servicing instructions ..... : | |
| In the operating instructions ..... : | |

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

| 4.5 | TABLE: Thermal requirements | | | | | | P |
|---|---|---|---|---|---|---|---|
| | Supply voltage (V) .....: | 24 Vd.c. | N/A | N/A | N/A | N/A | — |
| | Ambient $T_{min}$ (°C) .....: | 23.5 | N/A | N/A | N/A | N/A | — |
| | Ambient $T_{max}$ (°C) .....: | 24.6 | N/A | N/A | N/A | N/A | — |

| Maximum measured temperature T of part/at .... : | T (°C) | | | | | Allowed $T_{max}$ (°C) |
|---|---|---|---|---|---|---|
| 1. PCB near U19 | 110.9 | N/A | N/A | N/A | N/A | 130 |
| 2. PCB near U5 | 114.7 | N/A | N/A | N/A | N/A | 130 |
| 3. PCB near U1 | 114.4 | N/A | N/A | N/A | N/A | 130 |
| 4. PCB near BAT3 | 112.0 | N/A | N/A | N/A | N/A | 130 |
| 5. C157 body | 100.6 | N/A | N/A | N/A | N/A | 105 |
| 6. L7 body | 120.1 | N/A | N/A | N/A | N/A | 125 |
| 7. Enclosure - Inside | 96.4 | N/A | N/A | N/A | N/A | N/A |
| 8. Enclosure - Outside | 89.7 | N/A | N/A | N/A | N/A | 95 |
| 9. Enclosure - Cam Front | 80.7 | N/A | N/A | N/A | N/A | 95 |
| 10. Enclosure - Cam Rear | 78.9 | N/A | N/A | N/A | N/A | 95 |
| 11. Ambient | 24.6 (70.0 °C) | N/A | N/A | N/A | N/A | N/A |
| supplementary information: | | | | | | |
| Maximum temperature T at Tma (70 °C) is calculated. (T at Tma = T- $t_2$+Tma)<br>Temperature test was performed with K-type thermo-couple. | | | | | | |

| 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: | | |
| Certified Adapter used | | |

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

| 4.7 | **TABLE: Resistance to fire** | N/A |
|---|---|---|

| Part | Manufacturer of material | Type of material | Thickness (mm) | Flammability class | Evidence |
|---|---|---|---|---|---|
| | | | | | |
| supplementary information: | | | | | |
| | | | | | |

| 5.1 | **TABLE: touch current measurement** | N/A |
|---|---|---|

| Measured between: | Measured (mA) | Limit (mA) | Comments/conditions |
|---|---|---|---|
| | | | |
| supplementary information: | | | |
| Supply voltage: | | | |

| 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 |
|---|---|---|---|
| Functional: | | | |
| - | - | - | - |
| Basic/supplementary: | | | |
| | | | |
| Reinforced: | | | |
| | | | |
| supplementary information: | | | |
| | | | |

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

| | | | |
|---|---|---|---|
| **5.3** | **TABLE: Fault condition tests** | | P |
| | Ambient temperature (°C) .....: | 20-30 | — |
| | Power source for EUT: Manufacturer, model/type, output rating .....: | N/A | — |

| Component No. | Fault | Supply voltage (V) | Test time | Fuse # | Fuse current (A) | Observation |
|---|---|---|---|---|---|---|
| 1. C49 | Short | 24 Vd.c | 20 min | - | - | FI: 0.21 A, Normal operation, NCD, NC, NT, NB. |
| 2. C74 | Short | 24 Vd.c | 20 min | - | - | FI: 0.21 A, Normal operation, NCD, NC, NT, NB. |
| 3. CT1 | Short | 24 Vd.c | 20 min | - | - | FI: 0 A, Unit IP, NCD, NC, NT, NB |

supplementary information:

FI – Final Input Current; IP – Internal protection operated;
CD – Component Damaged (list damaged components); NCD – No Component Damaged;
CT – Constant temperatures were obtained (list components: temperature;);
NB – No indication of dielectric breakdown; YB – Dielectric breakdown (indicate time and location);
NC – Cheesecloth remained intact; YC – Cheesecloth charred or flamed;
NT – Tissue paper remained intact; YT – Tissue paper charred or flamed;

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

| C.2 | TABLE: transformers | | | | | | N/A |
|---|---|---|---|---|---|---|---|
| Loc. | Tested insulation | Working voltage peak / V<br>(2.10.2) | Working voltage rms / V<br>(2.10.2) | Required electric strength/ V<br>(5.2) | Required clearance / mm<br>(2.10.3) | Required creepage distance / mm<br>(2.10.4) | Required distance thr. insul.<br>(2.10.5) |
| | | | | | | | |
| Loc. | Tested insulation | | | Test voltage/ V | Measured clearance / mm | Measured creepage dist./ mm | Measured distance thr. insul. / mm; number of layers |
| | | | | | | | |
| supplementary information: | | | | | | | |
| Certified Adapter used | | | | | | | |

| C.2 | TABLE: transformers | N/A |
|---|---|---|
| | | |

**List of test equipment used:**
A completed list of used test equipment shall be provided in the Test Reports when a Manufacturer Testing Laboratory according to TMP/CTF stage 1 or WMT/CTF stage 2 procedure has been used.

| Clause | Measurement / testing | Testing / measuring equipment / material used | Range used | Calibration date |
|---|---|---|---|---|
| | | | | |
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## Attachment 1 – European Group Differences and National Differences

| IEC60950_1F - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

**ATTACHMENT TO TEST REPORT EN 60950-1**
**EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES**
Information technology equipment – Safety –

Part 1: General requirements

| | |
|---|---|
| **Differences according to ..... :** | EN 60950-1:2006/A11:2009/A1:2010/A12:2011/A2:2013 |
| **Attachment Form No. ..... :** | EU_GD_IEC60950_1F |
| **Attachment Originator ..... :** | SGS Fimko Ltd |
| **Master Attachment ..... :** | Date 2014-02 |



**EN 60950-1:2006/A11:2009/A1:2010/A12:2011/A2:2013 – CENELEC COMMON MODIFICATIONS**

| IEC 60950-1, GROUP DIFFERENCES (CENELEC common modifications EN) | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Clauses, subclauses, notes, tables and figures which are additional to those in IEC60950-1 and it´s amendmets are prefixed “Z” | | P |
| Contents<br><br><br><br><br>(A2:2013) | Add the following annexes:<br>Annex ZA (normative) Normative references to international publications with their corresponding European publications<br>Annex ZB (normative) Special national conditions<br>Annex ZD (informative) IEC and CENELEC code designations for flexible cords | | P |
| General | Delete all the “country” notes in the reference document (IEC 60950-1:2005) according to the following list:<br>1.4.8 Note 2 1.5.1 Note 2 & 3 1.5.7.1 Note<br>1.5.8 Note 2 1.5.9.4 Note 1.7.2.1 Note 4, 5 & 6<br>2.2.3 Note 2.2.4 Note 2.3.2 Note<br>2.3.2.1 Note 2 2.3.4 Note 2 2.6.3.3 Note 2 & 3<br>2.7.1 Note 2.10.3.2 Note 2 2.10.5.13 Note 3<br>3.2.1.1 Note 3.2.4 Note 3. 2.5.1 Note 2<br>4.3.6 Note 1 & 2 4.7 Note 4 4.7.2.2 Note<br>4.7.3.1Note 2 5.1.7.1 Note 3 & 4 5.3.7 Note 1<br>6 Note 2 & 5 6.1.2.1 Note 2 6.1.2.2 Note<br>6.2.2 Note 6.2.2.1 Note 2 6.2.2.2 Note<br>7.1 Note 3 7.2 Note 7.3 Note 1 & 2<br>G.2.1 Note 2 Annex H Note 2 | | P |

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

| **IEC 60950-1, GROUP DIFFERENCES (CENELEC common modifications EN)** | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| General (A1:2010) | Delete all the “country” notes in the reference document (IEC 60950-1:2005/A1:2010) according to the following list:<br>1.5.7.1 Note 6.1.2.1 Note 2<br>6.2.2.1 Note 2 EE.3 Note | | P |
| General (A2:2013) | Delete all the “country” notes in the reference document (IEC 60950-1:2005/A2:2013) according to the following list:<br>2.7.1 Note * 2.10.3.1 Note 2<br>6.2.2. Note<br>* Note of secretary: Text of Common Modification remains unchanged. | | P |
| 1.1.1 (A1:2010) | **Replace** the text of NOTE 3 by the following.<br>NOTE 3 The requirements of EN 60065 may also be used to meet safety requirements for multimedia equipment. See IEC Guide 112, Guide on the safety of multimedia equipment. For television sets EN 60065 applies. | | P |
| 1.3.Z1 | Add the following subclause:<br>1.3.Z1 Exposure to excessive sound pressure<br>The apparatus shall be so designed and constructed as to present no danger when used for its intended purpose, either in normal operating conditions or under fault conditions, particularly providing protection against exposure to excessive sound pressures from headphones or earphones.<br>NOTE Z1 A new method of measurement is described in EN 50332-1, Sound system equipment: Headphones and earphones associated with portable audio equipment - Maximum sound pressure level measurement methodology and limit considerations - Part 1: General method for “one package equipment”, and in EN 50332-2, Sound system equipment: Headphones and earphones associated with portable audio equipment - Maximum sound pressure level measurement methodology and limit considerations - Part 2: Guidelines to associate sets with headphones coming from different manufacturers. | | N/A |
| (A12:2011) | In EN 60950-1:2006/A12:2011<br>Delete the addition of 1.3.Z1 / EN 60950-1:2006<br>Delete the definition 1.2.3.Z1 / EN 60950-1:2006 /A1:2010 | | P |
| 1.5.1<br>(Added info*) | Add the following NOTE:<br>NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2002/95/EC.<br>New Directive 2011/65/11 * | | P |

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| **IEC 60950-1, GROUP DIFFERENCES (CENELEC common modifications EN)** | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 1.7.2.1<br>(A1:2010) | In addition, for a PORTABLE SOUND SYSTEM, the instructions shall include a warning that excessive sound pressure from earphones and headphones can cause hearing loss. | | N/A |
| 1.7.2.1<br>(A12.2011) | In EN 60950-1:2006/A12:2011<br>Delete NOTE Z1 and the addition for Portable Sound System.<br>Add the following clause and annex to the existing standard and amendments. | | N/A |
| | **Zx Protection against excessive sound pressure from personal music players** | | N/A |

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

| **IEC 60950-1, GROUP DIFFERENCES (CENELEC common modifications EN)** | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | **Zx.1 General**<br>This sub-clause specifies requirements for protection against excessive sound pressure from personal music players that are closely coupled to the ear. It also specifies requirements for earphones and headphones intended for use with personal music players.<br>A personal music player is a portable equipment for personal use, that:<br>- is designed to allow the user to listen to recorded or broadcast sound or video; and<br>- primarily uses headphones or earphones that can be worn in or on or around the ears; and<br>- allows the user to walk around while in use.<br>NOTE 1 Examples are hand-held or body-worn portable CD players, MP3 audio players, mobile phones with MP3 type features, PDA's or similar equipment.<br>A personal music player and earphones or headphones intended to be used with personal music players shall comply with the requirements of this sub-clause.<br>The requirements in this sub-clause are valid for music or video mode only.<br>The requirements do not apply:<br>- while the personal music player is connected to an external amplifier; or<br>- while the headphones or earphones are not used.<br>NOTE 2 An external amplifier is an amplifier which is not part of the personal music player or the listening device, but which is intended to play the music as a standalone music player.<br>The requirements do not apply to:<br>- hearing aid equipment and professional equipment;<br>NOTE 3 Professional equipment is equipment sold through special sales channels. All products sold through normal electronics stores are considered not to be professional equipment. | | N/A |

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| **IEC 60950-1, GROUP DIFFERENCES (CENELEC common modifications EN)** | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| | - analogue personal music players (personal music players without any kind of digital processing of the sound signal) that are brought to the market before the end of 2015.<br>NOTE 4 This exemption has been allowed because this technology is falling out of use and it is expected that within a few years it will no longer exist. This exemption will not be extended to other technologies.<br>For equipment which is clearly designed or intended for use by young children, the limits of EN 71-1 apply. | | N/A |
| | **Zx.2 Equipment requirements**<br>No safety provision is required for equipment that complies with the following:<br>- equipment provided as a package (personal music player with its listening device), where<br>- the acoustic output LAeq,T is ≤ 85 dBA measured while playing the fixed “programme simulation noise” as described in EN 50332-1; and<br>- a personal music player provided with an analogue electrical output socket for a listening device, where the electrical output is ≤ 27 mV measured as described in EN 50332-2, while playing the fixed “programme simulation noise” as described in EN 50332-1.<br>NOTE 1 Wherever the term acoustic output is used in this clause, the 30 s A-weighted equivalent sound pressure level LAeq,T is meant. See also Zx.5 and Annex Zx.<br>All other equipment shall:<br>a) protect the user from unintentional acoustic outputs exceeding those mentioned above; and<br>b) have a standard acoustic output level not exceeding those mentioned above, and<br>automatically return to an output level not exceeding those mentioned above when the power is switched off; and | | N/A |

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| **IEC 60950-1, GROUP DIFFERENCES (CENELEC common modifications EN)** | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | c) provide a means to actively inform the user of the increased sound pressure when the equipment is operated with an acoustic output exceeding those mentioned above. Any means used shall be acknowledged by the user before activating a mode of operation which allows for an acoustic output exceeding those mentioned above. The acknowledgement does not need to be repeated more than once every 20 h of cumulative listening time; and<br>NOTE 2 Examples of means include visual or audible signals. Action from the user is always required.<br>NOTE 3 The 20 h listening time is the accumulative listening time, independent how often and how long the personal music player has been switched off.<br>d) have a warning as specified in Zx.3; and<br>e) not exceed the following:<br>1) equipment provided as a package (player with Its listening device), the acoustic output shall be ≤ 100 dBA measured while playing the fixed “programme simulation noise” described in EN 50332-1; and<br>2) a personal music player provided with an analogue electrical output socket for a listening device, the electrical output shall be ≤ 150 mV measured as described in EN 50332-2, while playing the fixed “programme simulation noise” described in EN 50332-1.<br>For music where the average sound pressure (long term LAeq,T) measured over the duration of the song is lower than the average produced by the programme simulation noise, the warning does not need to be given as long as the average sound pressure of the song is below the basic limit of 85 dBA. In this case T becomes the duration of the song.<br>NOTE 4 Classical music typically has an average sound pressure (long term LAeq,T) which is much lower than the average programme simulation noise. Therefore, if the player is capable to analyse the song and compare it with the programme simulation noise, the warning does not need to be given as long as the average sound pressure of the song is below the basic limit of 85 dBA.<br>For example, if the player is set with the programme simulation noise to 85 dBA, but the average music level of the song is only 65 dBA, there is no need to give a warning or ask an acknowledgement as long as the average sound level of the song is not above the basic limit of 85 dBA. | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | **Zx.3 Warning**<br>The warning shall be placed on the equipment, or on the packaging, or in the instruction manual and shall consist of the following:<br>- the symbol of Figure 1 with a minimum height of 5 mm; and<br>- the following wording, or similar:<br>"To prevent possible hearing damage, do not listen at high volume levels for long periods."<br>  <br>Figure 1 – Warning label (IEC 60417-6044)<br>Alternatively, the entire warning may be given through the equipment display during use, when the user is asked to acknowledge activation of the higher level. | | N/A |
| | **Zx.4 Requirements for listening devices (headphones and earphones)** | | N/A |
| | **Zx.4.1 Wired listening devices with analogue input**<br>With 94 dBA sound pressure output LAeq,T, the input voltage of the fixed "programme simulation noise" described in EN 50332-2 shall be ≥ 75 mV.<br>This requirement is applicable in any mode where the headphones can operate (active or<br>passive), including any available setting (for example built-in volume level control).<br>NOTE The values of 94 dBA – 75 mV correspond with 85dBA – 27 mV and 100 dBA – 150 mV. | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | **Zx.4.2 Wired listening devices with digital input**<br>With any playing device playing the fixed "programme simulation noise" described in EN 50332-1 (and respecting the digital interface standards, where a digital interface standard exists that specifies the equivalent acoustic level), the acoustic output LAeq,T of the listening device shall be ≤ 100 dBA.<br>This requirement is applicable in any mode where the headphones can operate, including any available setting (for example built-in volume level control, additional sound feature like equalization, etc.).<br>NOTE An example of a wired listening device with digital input is a USB headphone. | | N/A |
| | **Zx.4.3 Wireless listening devices**<br>In wireless mode:<br>- with any playing and transmitting device playing the fixed programme simulation noise described in EN 50332-1; and<br>- respecting the wireless transmission standards, where an air interface standard exists that specifies the equivalent acoustic level; and<br>- with volume and sound settings in the listening device (for example built-in volume level control, additional sound feature like equalization, etc.) set to the combination of positions that maximize the measured acoustic output for the abovementioned programme simulation noise, the acoustic output LAeq,T of the listening device shall be ≤ 100 dBA.<br>NOTE An example of a wireless listening device is a Bluetooth headphone. | | N/A |
| | **Zx.5 Measurement methods**<br>Measurements shall be made in accordance with EN 50332-1 or EN 50332-2 as applicable. Unless stated otherwise, the time interval T shall be 30 s.<br>NOTE Test method for wireless equipment provided without listening device should be defined. | | N/A |

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| **IEC 60950-1, GROUP DIFFERENCES (CENELEC common modifications EN)** | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 2.7.1 | Replace the subclause as follows:<br>Basic requirements<br>To protect against excessive current, short-circuits and earth faults in PRIMARY CIRCUITS, protective devices shall be included either as integral parts of the equipment or as parts of the building installation, subject to the following, a), b) and c):<br>a) except as detailed in b) and c), protective devices necessary to comply with the requirements of 5.3 shall be included as parts of the equipment;<br>b) for components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, short-circuit and earth fault protection may be provided by protective devices in the building installation; | | N/A |
| | c) it is permitted for PLUGGABLE EQUIPMENT TYPE B or PERMANENTLY CONNECTED EQUIPMENT, to rely on dedicated overcurrent and short-circuit protection in the building installation, provided that the means of protection, e.g. fuses or circuit breakers, is fully specified in the installation instructions.<br>If reliance is placed on protection in the building installation, the installation instructions shall so state, except that for PLUGGABLE EQUIPMENT TYPE A the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet. | | N/A |
| 2.7.2 | This subclause has been declared ‘void’. | | P |
| 3.2.3 | Delete the NOTE in Table 3A, and delete also in this table the conduit sizes in parentheses. | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 3.2.5.1 | Replace "60245 IEC 53" by "H05 RR-F";<br>"60227 IEC 52" by "H03 VV-F or H03 VVH2-F";<br>"60227 IEC 53" by "H05 VV-F or H05 VVH2-F2".<br>In Table 3B, replace the first four lines by the following:<br>Up to and including 6 \| 0,75 [a] \|<br>Over 6 up to and including 10\| (0,75) [b] 1,0 \|<br>Over 10 up to and including 16\| (1,0) [c] 1,5 \|<br>In the conditions applicable to Table 3B delete the words "in some countries" in condition [a].<br>In NOTE 1, applicable to Table 3B, delete the second sentence. | | N/A |
| 3.2.5.1 (A2:2013) | NOTE Z1 The harmonised code designations corresponding to the IEC cord types are given in Annex ZD | | N/A |
| 3.3.4 | In Table 3D, delete the fourth line: conductor sizes for 10 to 13 A, and replace with the following:<br>Over 10 up to and including 16 \| 1,5 to 2,5 \| 1,5 to 4 \|<br>Delete the fifth line: conductor sizes for 13 to 16 A | | N/A |
| 4.3.13.6 (A1:2010) | Replace the existing NOTE by the following:<br>NOTE Z1 Attention is drawn to:<br>1999/519/EC: Council Recommendation on the limitation of exposure of the general public to electromagnetic fields 0 Hz to 300 GHz, and<br>2006/25/EC: Directive on the minimum health and safety requirements regarding the exposure of workers to risks arising from physical agents (artifical optical radiation). | | N/A |
| | Standards taking into account mentioned Recommendation and Directive which demonstrate compliance with the applicable EU Directive are indicated in the OJEC. | | N/A |
| Annex H | Replace the last paragraph of this annex by:<br>At any point 10 cm from the surface of the OPERATOR ACCESS AREA, the dose rate shall not exceed 1 µSv/h (0,1 mR/h) (see NOTE). Account is taken of the background level.<br>Replace the notes as follows:<br>NOTE These values appear in Directive 96/29/Euratom.<br>Delete NOTE 2. | | N/A |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| Bibliography | Additional EN standards. | | N/A |

| | | |
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| **ZA** | **NORMATIVE REFERENCES TO INTERNATIONAL PUBLICATIONS WITH THEIR CORRESPONDING EUROPEAN PUBLICATIONS** | — |

| **ZB ANNEX (normative)**<br>**SPECIAL NATIONAL CONDITIONS (EN)** | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 1.2.4.1 | In **Denmark**, certain types of Class I appliances (see 3.2.1.1) may be provided with a plug not establishing earthing conditions when inserted into Danish socket-outlets. | | N/A |
| 1.2.13.14 (A11:2009) | In **Norway** and **Sweden**, for requirements see 1.7.2.1 and 7.3 of this annex. | | N/A |
| 1.5.7.1 (A11:2009) | In **Finland**, **Norway** and **Sweden**, resistors bridging BASIC INSULATION in CLASS I PLUGGABLE EQUIPMENT TYPE A must comply with the requirements in 1.5.7.1. In addition when a single resistor is used, the resistor must withstand the resistor test in 1.5.7.2. | | N/A |
| 1.5.8 | In **Norway**, due to the IT power system used (see annex V, Figure V.7), capacitors are required to be rated for the applicable line-to-line voltage (230 V). | | N/A |
| 1.5.9.4 | In **Finland**, **Norway** and **Sweden**, the third dashed sentence is applicable only to equipment as defined in 6.1.2.2 of this annex. | | N/A |

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| **ZB ANNEX (normative)**<br>**SPECIAL NATIONAL CONDITIONS (EN)** | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 1.7.2.1 | In **Finland**, **Norway** and **Sweden**, CLASS I PLUGGABLE EQUIPMENT TYPE A intended for connection to other equipment or a network shall, if safety relies on connection to protective earth or if surge suppressors are connected between the network terminals and accessible parts, have a marking stating that the equipment must be connected to an earthed mains socket-outlet.<br>The marking text in the applicable countries shall be as follows:<br>In **Finland**: "Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan"<br>In **Norway**: “Apparatet må tilkoples jordet stikkontakt”<br>In **Sweden**: “Apparaten skall anslutas till jordat uttag” | | N/A |
| 1.7.2.1 (A11:2009) | In **Norway** and **Sweden**, the screen of the cable distribution system is normally not earthed at the entrance of the building and there is normally no equipotential bonding system within the building. Therefore the protective earthing of the building installation need to be isolated from the screen of a cable distribution system.<br>It is however accepted to provide the insulation external to the equipment by an adapter or an interconnection cable with galvanic isolator, which may be provided by e.g. a retailer.<br>The user manual shall then have the following or similar information in Norwegian and Swedish language respectively, depending on in what country the equipment is intended to be used in:<br>“Equipment connected to the protective earthing of the building installation through the mains connection or through other equipment with a connection to protective earthing – and to a cable distribution system using coaxial cable, may in some circumstances create a fire hazard. Connection to a cable distribution system has therefore to be provided through a device providing electrical isolation below a certain frequency range (galvanic isolator, see EN 60728-11).” | | |

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| **ZB ANNEX (normative)**<br>**SPECIAL NATIONAL CONDITIONS (EN)** | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | NOTE In Norway, due to regulation for installations of cable distribution systems, and in Sweden, a galvanic isolator shall provide electrical insulation below 5 MHz. The insulation shall withstand a dielectric strength of 1,5 kV r.m.s., 50 Hz or 60 Hz, for 1 min.<br>Translation to Norwegian (the Swedish text will also be accepted in Norway):<br>“Utstyr som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkoplet utstyr – og er tilkoplet et kabel-TV nett, kan forårsake brannfare. For å unngå dette skal det ved tilkopling av utstyret til kabel-TV nettet installeres en galvanisk isolator mellom utstyret og kabel- TV nettet.”<br>Translation to Swedish:<br>”Utrustning som är kopplad till skyddsjord via jordat vägguttag och/eller via annan utrustning och samtidigt är kopplad till kabel-TV nät kan i vissa fall medföra risk för brand. För att undvika detta skall vid anslutning av utrustningen till kabel-TV nät galvanisk isolator finnas mellan utrustningen och kabel-TV nätet.” | | N/A |
| 1.7.2.1 (A2:2013) | In **Denmark**, CLASS I PLUGGABLE EQUIPMENT TYPE A intended for connection to other equipment or a network shall, if safety relies on connection to protective earth or if surge suppressors are connected between the network terminals and accessible parts, have a marking stating that the equipment must be connected to an earthed mains socket-outlet.<br>The marking text in **Denmark** shall be as follows:<br>In **Denmark**: “Apparatets stikprop skal tilsluttes en stikkontakt med jord, som giver forbindelse til stikproppens jord.” | | N/A |
| 1.7.5<br><br>1.7.5 (A11:2009) | In **Denmark**, socket-outlets for providing power to other equipment shall be in accordance with the Heavy Current Regulations, Section 107-2-D1, Standard Sheet DK 1-3a, DK 1-5a or DK 1-7a, when used on Class I equipment. For STATIONARY EQUIPMENT the socket-outlet shall be in accordance with Standard Sheet DK 1-1b or DK 1-5a.<br>For **CLASS II EQUIPMENT** the socket outlet shall be in accordance with Standard Sheet DKA 1-4a. | | N/A |

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| **ZB ANNEX (normative)**<br>**SPECIAL NATIONAL CONDITIONS (EN)** | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 1.7.5 (A2:2013) | In **Denmark**, socket-outlets for providing power to other equipment shall be in accordance with the DS 60884-2-D1:2011.<br>For class I equipment the following Standard Sheets are applicable: DK 1-3a, DK 1-1c, DK 1-1d, DK 1-5a or DK 1-7a, with the exception for STATIONARY EQUIPMENT where the socket-outlets shall be in accordance with Standard Sheet DK 1-1b, DK 1-1c, DK 1-1d or DK 1-5a.<br>Socket outlets intended for providing power to Class II apparatus with a rated current of 2,5 A shall be in accordance with DS 60884-2-D1 standard sheet DKA 1-4a. Other current rating socket outlets shall be in compliance with by DS 60884-2-D1 Standard Sheet DKA 1-3a or DKA 1-3b.<br>Justification<br>the Heavy Current Regulations, 6c | | N/A |
| 2.2.4 | In **Norway**, for requirements see 1.7.2.1, 6.1.2.1 and 6.1.2.2 of this annex. | | N/A |
| 2.3.2 | In **Finland**, **Norway** and **Sweden** there are additional requirements for the insulation. See 6.1.2.1 and 6.1.2.2 of this annex. | | N/A |
| 2.3.4 | In **Norway**, for requirements see 1.7.2.1, 6.1.2.1 and 6.1.2.2 of this annex. | | N/A |
| 2.6.3.3 | In the **United Kingdom**, the current rating of the circuit shall be taken as 13 A, not 16 A. | | N/A |
| 2.7.1 | In the **United Kingdom**, to protect against excessive currents and short-circuits in the PRIMARY CIRCUIT of DIRECT PLUG-IN EQUIPMENT, tests according to 5.3 shall be conducted, using an external protective device rated 30 A or 32 A. If these tests fail, suitable protective devices shall be included as integral parts of the DIRECT PLUG-IN EQUIPMENT, so that the requirements of 5.3 are met. | | N/A |
| 2.10.5.13 | In **Finland**, **Norway** and **Sweden**, there are additional requirements for the insulation, see 6.1.2.1 and 6.1.2.2 of this annex. | | N/A |

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| **ZB ANNEX (normative)**<br>**SPECIAL NATIONAL CONDITIONS (EN)** | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 3.2.1.1 | In **Switzerland**, supply cords of equipment having a RATED CURRENT not exceeding 10 A shall be provided with a plug complying with SEV 1011 or IEC 60884-1 and one of the following dimension sheets:<br>SEV 6532-2.1991 Plug Type 15 3P+N+PE 250/400 V, 10 A<br>SEV 6533-2.1991 Plug Type 11 L+N 250 V, 10 A<br>SEV 6534-2.1991 Plug Type 12 L+N+PE 250 V, 10 A<br>In general, EN 60309 applies for plugs for currents exceeding 10 A. However, a 16 A plug and socket-outlet system is being introduced in Switzerland, the plugs of which are according to the following dimension sheets, published in February 1998:<br>SEV 5932-2.1998: Plug Type 25 , 3L+N+PE 230/400 V, 16 A<br>SEV 5933-2.1998:Plug Type 21, L+N, 250 V, 16 A<br>SEV 5934-2.1998: Plug Type 23, L+N+PE 250 V, 16 A | | N/A |
| 3.2.1.1 | In **Denmark**, supply cords of single-phase equipment having a rated current not exceeding13 A shall be provided with a plug according to the Heavy Current Regulations, Section 107-2-D1.<br>CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a.<br>If poly-phase equipment and single-phase equipment having a RATED CURRENT exceeding 13 A is provided with a supply cord with a plug, this plug shall be in accordance with the Heavy Current Regulations, Section 107-2-D1 or EN 60309-2. | | N/A |

## Attachment 1 – European Group Differences and National Differences

| IEC60950_1F - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| **ZB ANNEX (normative)**<br>**SPECIAL NATIONAL CONDITIONS (EN)** | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 3.2.1.1 (A2:2013) | In **Denmark**, supply cords of single-phase equipment having a rated current not exceeding 13 A shall be provided with a plug according to DS 60884-2-D1.<br>CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a.<br>If a single-phase equipment having a RATED CURRENT exceeding 13 A or if a poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance with the standard sheets DK 6-1a in DS 60884-2-D1 or EN 60309-2.<br>Justification<br>the Heavy Current Regulations, 6c | | N/A |
| 3.2.1.1 | In **Spain**, supply cords of single-phase equipment having a rated current not exceeding 10 A shall be provided with a plug according to UNE 20315:1994.<br>Supply cords of single-phase equipment having a rated current not exceeding 2,5 A shall be provided with a plug according to UNE-EN 50075:1993.<br>CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules, shall be provided with a plug in accordance with standard UNE 20315:1994.<br>If poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance with UNE-EN 60309-2. | | N/A |
| 3.2.1.1 | In the **United Kingdom**, apparatus which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to BS 1363 by means of that flexible cable or cord and plug, shall be fitted with a 'standard plug' in accordance with Statutory Instrument 1768:1994 - The Plugs and Sockets etc. (Safety) Regulations 1994, unless exempted by those regulations.<br>NOTE 'Standard plug' is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug. | | N/A |

## Attachment 1 – European Group Differences and National Differences

| IEC60950_1F - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| **ZB ANNEX (normative)**<br>**SPECIAL NATIONAL CONDITIONS (EN)** | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 3.2.1.1 | In **Ireland**, apparatus which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to I.S. 411 by means of that flexible cable or cord and plug, shall be fitted with a 13 A plug in accordance with Statutory Instrument 525:1997 - National Standards Authority of Ireland (section 28) (13 A Plugs and Conversion Adaptors for Domestic Use) Regulations 1997. | | N/A |
| 3.2.4 | In **Switzerland**, for requirements see 3.2.1.1 of this annex. | | N/A |
| 3.2.5.1 | In the **United Kingdom**, a power supply cord with conductor of 1,25 mm2 is allowed for equipment with a rated current over 10 A and up to and including 13 A. | | N/A |
| 3.3.4 | In the **United Kingdom**, the range of conductor sizes of flexible cords to be accepted by terminals for equipment with a RATED CURRENT of over 10 A up to and including 13 A is:<br>• 1,25 $mm^2$ to 1,5 $mm^2$ nominal cross-sectional area. | | N/A |
| 4.3.6 | In the **United Kingdom**, the torque test is performed using a socket outlet complying with BS 1363 part 1:1995, including Amendment 1:1997 and Amendment 2:2003 and the plug part of DIRECT PLUG-IN EQUIPMENT shall be assessed to BS 1363: Part 1, 12.1, 12.2, 12.3, 12.9, 12.11, 12.12, 12.13, 12.16 and 12.17, except that the test of 12.17 is performed at not less than 125 °C. Where the metal earth pin is replaced by an Insulated Shutter Opening Device (ISOD), the requirements of clauses 22.2 and 23 also apply. | | N/A |
| 4.3.6 | In **Ireland**, DIRECT PLUG-IN EQUIPMENT is known as plug similar devices. Such devices shall comply with Statutory Instrument 526:1997 - National Standards Authority of Ireland (Section 28) (Electrical plugs, plug similar devices and sockets for domestic use) Regulations, 1997. | | N/A |

## Attachment 1 – European Group Differences and National Differences

| IEC60950_1F - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| **ZB ANNEX (normative)**<br>**SPECIAL NATIONAL CONDITIONS (EN)** | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.1.7.1 | In **Finland**, **Norway** and **Sweden** TOUCH CURRENT measurement results exceeding 3,5 mA r.m.s. are permitted only for the following equipment:<br>• STATIONARY PLUGGABLE EQUIPMENT TYPE A that<br>is intended to be used in a RESTRICTED ACCESS LOCATION where equipotential bonding has been applied, for example, in a telecommunication centre; and<br>has provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR; and<br>is provided with instructions for the installation of that conductor by a SERVICE PERSON;<br>• STATIONARY PLUGGABLE EQUIPMENT TYPE B;<br>• STATIONARY PERMANENTLY CONNECTED EQUIPMENT. | | N/A |

## Attachment 1 – European Group Differences and National Differences

| IEC60950_1F - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| **ZB ANNEX (normative)**<br>**SPECIAL NATIONAL CONDITIONS (EN)** | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 6.1.2.1<br>(A1:2010) | In **Finland**, **Norway** and **Sweden**, add the following text between the first and second paragraph of the compliance clause:<br>If this insulation is solid, including insulation forming part of a component, it shall at least consist of either<br>- two layers of thin sheet material, each of which shall pass the electric strength test below, or<br>- one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below.<br>Alternatively for components, there is no distance through insulation requirements for the insulation consisting of an insulating compound completely filling the casing, so that CLEARANCES and CREEPAGE DISTANCES do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition<br>- passes the tests and inspection criteria of 2.10.11 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of<br>2.10.10 shall be performed using 1,5 kV), and<br>- is subject to ROUTINE TESTING for electric strength during manufacturing, using a test voltage of 1,5 kV. | | N/A |

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## Attachment 1 – European Group Differences and National Differences

| IEC60950_1F - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| **ZB ANNEX (normative)**<br>**SPECIAL NATIONAL CONDITIONS (EN)** | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | It is permitted to bridge this insulation with an optocoupler complying with 2.10.5.4 b).<br><br>It is permitted to bridge this insulation with a capacitor complying with EN 60384-14:2005, subclass Y2.<br>A capacitor classified Y3 according to EN 60384-14:2005, may bridge this insulation under the following conditions:<br>- the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 60384-14, which in addition to the Y3 testing, is tested with an impulse test of 2,5 kV defined in EN 60950-1:2006, 6.2.2.1;<br>- the additional testing shall be performed on all the test specimens as described in EN 60384-14:<br>- the impulse test of 2,5 kV is to be performed before the endurance test in EN 60384-14, in the sequence of tests as described in EN 60384-14. | | N/A |
| 6.1.2.2 | In **Finland**, **Norway** and **Sweden**, the exclusions are applicable for PERMANENTLY CONNECTED EQUIPMENT, PLUGGABLE EQUIPMENT TYPE B and equipment intended to be used in a RESTRICTED ACCESS LOCATION where equipotential bonding has been applied, e.g. in a telecommunication centre, and which has provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR and is provided with instructions for the installation of that conductor by a SERVICE PERSON. | | N/A |
| 7.2 | In **Finland**, **Norway** and **Sweden**, for requirements see 6.1.2.1 and 6.1.2.2 of this annex.<br>The term TELECOMMUNICATION NETWORK in 6.1.2 being replaced by the term CABLE DISTRIBUTION SYSTEM. | | N/A |
| 7.3 (A11:2009) | In **Norway** and **Sweden**, for requirements see 1.2.13.14 and 1.7.2.1 of this annex. | | N/A |

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## Attachment 1 – European Group Differences and National Differences

| IEC60950_1F - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

**Annex ZD**
**(informative)**

**IEC and CENELEC code designations for flexible cords**

| Type of flexible cord | Code designations | |
|---|---|---|
| | IEC | CENELEC |
| **PVC insulated cords** | | |
| Flat twin tinsel cord | 60227 IEC 41 | H03VH-Y |
| Light polyvinyl chloride sheathed flexible cord | 60227 IEC 52 | H03VV-F<br>H03VVH2-F |
| Ordinary polyvinyl chloride sheathed flexible cord | 60277 IEC 53 | H05VV-F<br>H05VVH2-F |
| **Rubber insulated cords** | | |
| Braided cord | 60245 IEC 51 | H03RT-F |
| Ordinary tough rubber sheathed flexible cord | 60245 IEC 53 | H05RR-F |
| Ordinary polychloroprene sheathed flexible cord | 60245 IEC 57 | H05RN-F |
| Heavy polychloroprene sheathed flexible cord | 60245 IEC 66 | H07RN-F |
| **Cords having high flexibility** | | |
| Rubber insulated and sheathed cord | 60245 IEC 86 | H03RR-H |
| Rubber insulated, crosslinked PVC sheathed cord | 60245 IEC 87 | H03RV4-H |
| Crosslinked PVC insulated and sheathed cord | 60245 IEC 88 | H03V4V4-H |

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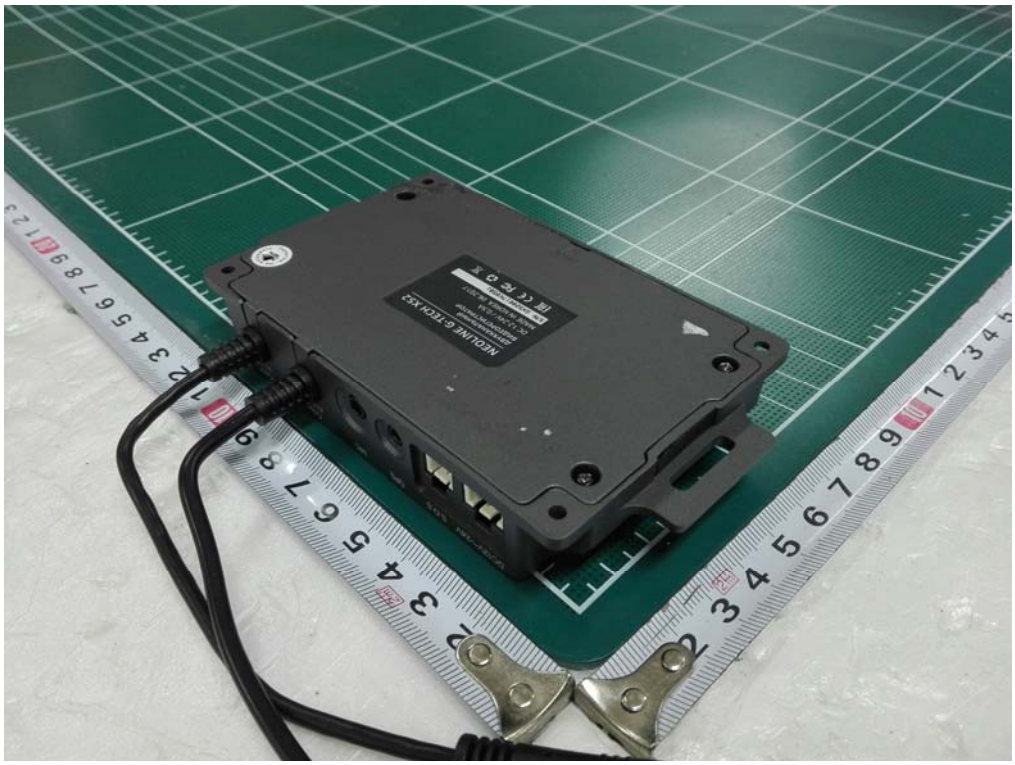
## Attachment 2 – Photographs

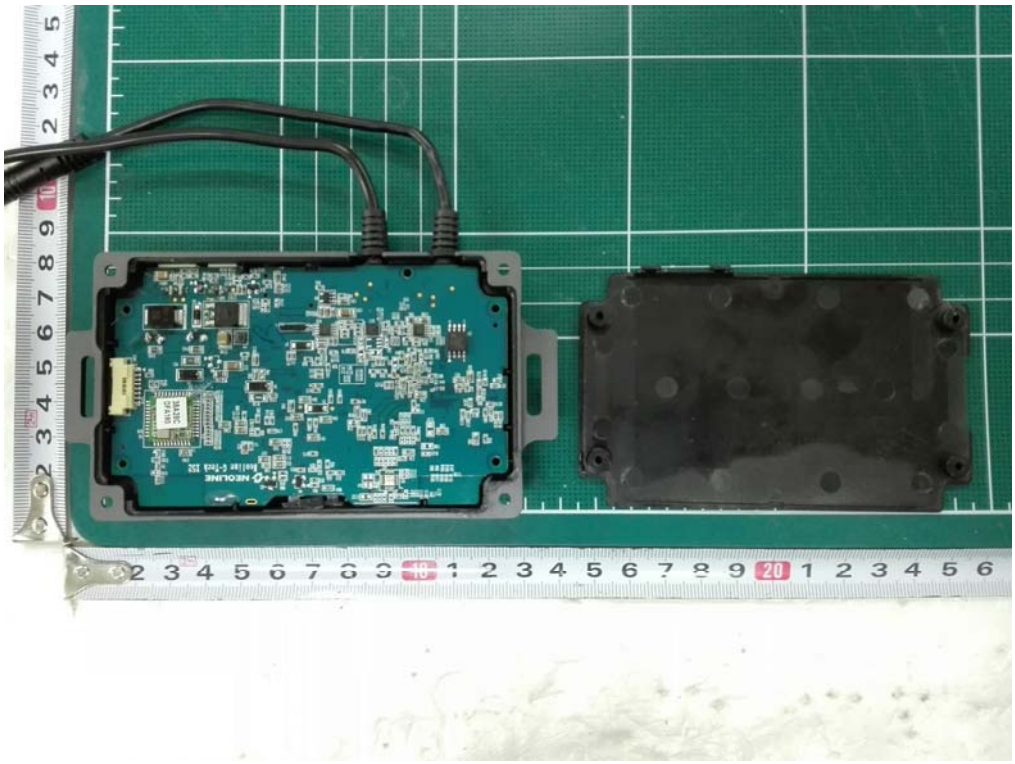
**<Photo 1> External view**

**<Photo 2> External view**

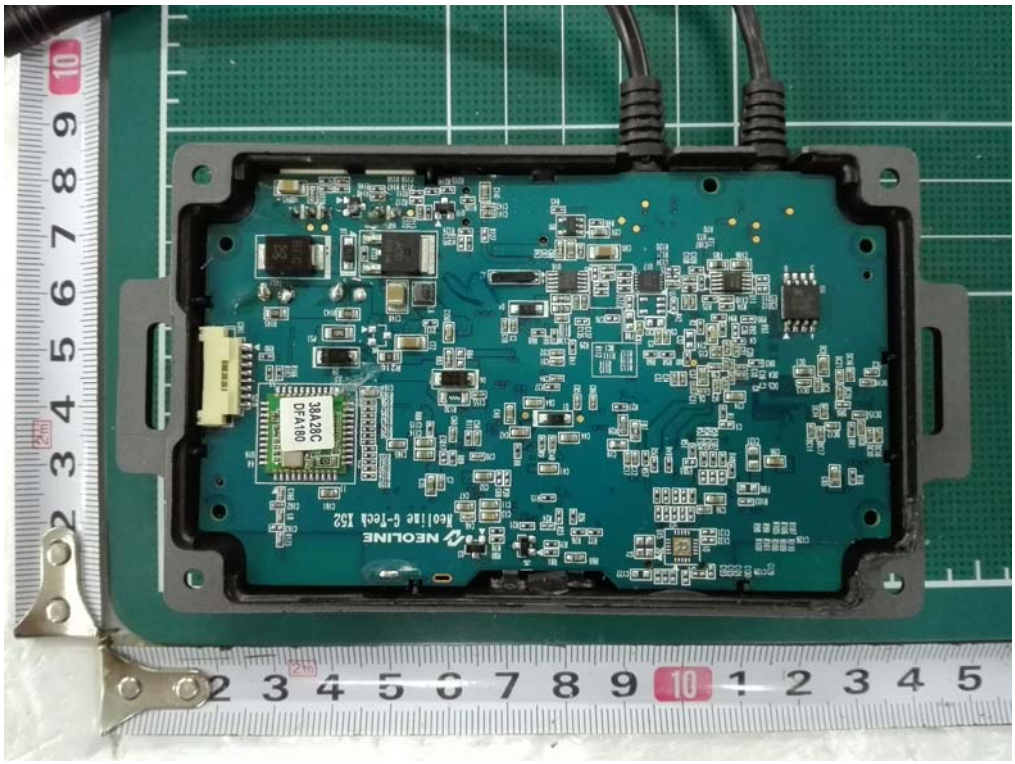


## Attachment 2 – Photographs

**<Photo 3> Internal view**



**<Photo 4> Internal view**



**<Photo 5> PCB Top view**

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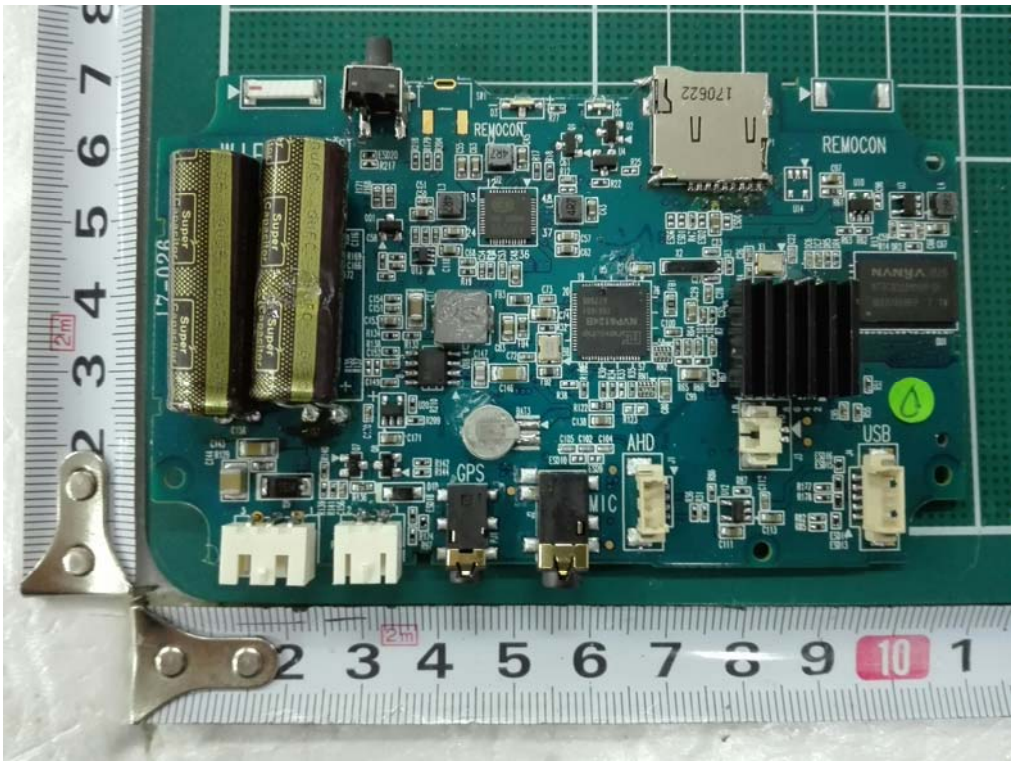
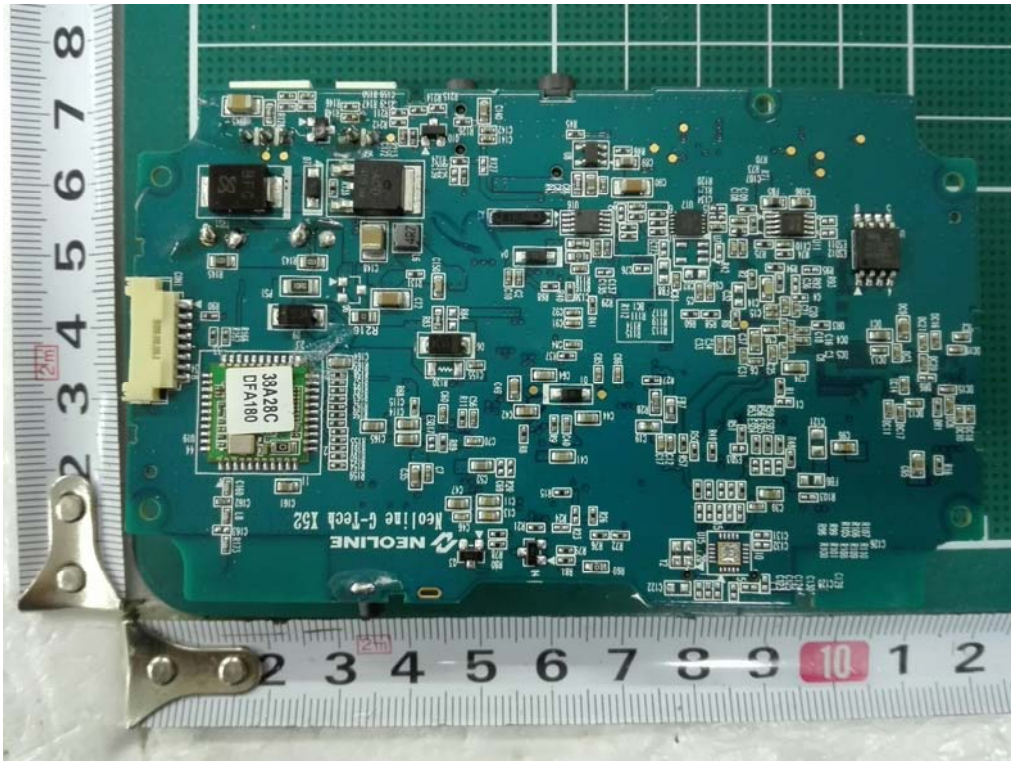



**<Photo 6> PCB Bottom view**




**<Photo 7> Front camera view**

## Attachment 2 – Photographs

**<Photo 8> Rear camera view**