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TEST REPORT

EN 60950-1

Information technology equipment – Safety –

Part 1: General requirements

Report reference No. ..... :	**CTL1906244051-WS**
Tested by (name + signature) ..... :	Arno Liu
Supervised by (name + signature) ... :	Bright Gao
Approved by (name + signature) ..... :	Jacky Chen
Date of issue ..... :	Jul. 26, 2019
Testing Laboratory Name ..... :	**Shenzhen CTL Testing Technology Co., Ltd.**
Address ..... :	Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055
Applicant's Name ..... :	**BeagleBoard.org Foundation**
Address ..... :	4467 Ascot Court Oakland Township, Michigan, US
Test specification	
Standard ..... :	EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013
Test procedure ..... :	CE Attestation
Non-standard test method ..... :	N/A
Test Report Form No. ..... :	EN60950_1B
TRF originator. ..... :	SGS Fimko Ltd
Master TRF ..... :	Dated 2014-04
Test item description ..... :	Beaglebone AI
Trademark ..... :	N/A
Manufacturer ..... :	Embest Technology Co., Ltd
	Tower B 4/F, Shanghai Building, Nanshan Yungu Innovation Industry Park, Liuxian Ave. No.1183, Taoyuan St., Nanshan District, Shenzhen, China.
Model and/or type reference ..... :	Beaglebone AI
Ratings ..... :	5.0V ⎓ 2A

Summary of testing:

Testing location:

Shenzhen CTL Testing Technology Co., Ltd.

Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055

Tests performed (name of test and test clause):

The sample(s) tested complies with the requirements of EN 60950-1.

These tests fulfil the requirements of standard ISO/IEC 17025.

When determining the test conclusion, the Measurement Uncertainty of test has been considered.

Heating test (4.5):

Tma = 45.0℃ (declared by manufacturer)

Tamb: 24.5℃ – 25.0℃

T-type thermocouple used for temperature measurement.

This test report includes:

Annex 1: Photos

Summary of compliance with National Differences:

Compliance with the National requirements of CENELEC common modification.

Copy of marking plate:

Beaglebone AI
Model: Beaglebone AI

Ratings: 5.0V ⎓ 2A

Manufacturer: Embest Technology Co., Ltd

Tower B 4/F, Shanghai Building, Nanshan Yungu Innovation Industry Park, Liuxian Ave. No.1183, Taoyuan St., Nanshan District, Shenzhen, China.

Importer name: XXXXXXXXXXXXXXXXXXXXXXXXXXXX

Importer address: XXXXXXXXXXXXXXXXXXXXXXXXXXX

Made In China

Remark: the marking plates of other models are in the same pattern.

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

Size of CE mark must be in correct ratio and ≥ 5mm in height, and size of WEEE mark must be in correct ratio and ≥ 7mm in height.

Test item particulars ..... :	
Equipment mobility ..... :	[ ] movable [ ] hand-held [x] transportable [ ] stationary [ ] for building-in [ ] direct plug-in
Connection to the mains..... :	[ ] pluggable equipment [ ] type A [ ] type B [ ] permanent connection [ ] detachable power supply cord [ ] non-detachable power supply cord [x] not directly connected to the mains
Operating condition ..... :	[x] continuous [ ] rated operating / resting time:
Access location ..... :	[x] operator accessible [ ] restricted access location
Over voltage category (OVC) ..... :	[ ] OVC I [ ] OVC II [ ] OVC III [ ] OVC IV [x] other: No direct connection with mains.
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 [ ] Not classified
Considered current rating of protective device as part of the building installation (A) ..... :	N/A
Pollution degree (PD) ..... :	[ ] PD 1 [ ] PD 2 [ ] PD 3
IP protection class ..... :	N/A
Altitude during operation (m) ..... :	Up to 2000 m
Altitude of test laboratory (m) ..... :	below 2000 m
Mass of equipment (kg) ..... :	0.045kg
Possible test case verdicts:	
- test case does not apply to the test object ..... :	N (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..... :	Jul. 02, 2019
Date of sampling..... :	Jul. 02, 2019
Date(s) of performance of tests..... :	Jul. 02, 2019 to Jul. 05, 2019

General remarks:

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

Note: This TRF includes EN Group Differences together with National Differences and Special National Conditions, if any. All Differences are located in the Appendix to the main body of this TRF.

General product information:

Beaglebone AI, powered by DC5V, electronic components mounted on PCB, for use indoor only.

EN 60950-1			
Clause	Requirement	Remark	Result
1	GENERAL		P
1.5	Components		P
1.5.1	General		P
	Comply with IEC 60950-1 or relevant component standard	(see appended table 1.5.1)	P
1.5.2	Evaluation and testing of components	Certified components are used in accordance with their ratings, certifications and they comply with applicable parts of this standard. Components not certified are used in accordance with their ratings and they comply with applicable parts of IEC 60950-1 and the relevant component standard. Components, for which no relevant IEC-standard exists, have been tested under the conditions occurring in the equipment, using applicable parts of IEC 60950-1.	P
1.5.3	Thermal controls		N
1.5.4	Transformers		N
1.5.5	Interconnecting cables		N
1.5.6	Capacitors bridging insulation		N
1.5.7	Resistors bridging insulation		N
1.5.7.1	Resistors bridging functional, basic or supplementary insulation		N
1.5.7.2	Resistors bridging double or reinforced insulation between a.c. mains and other circuits		N
1.5.7.3	Resistors bridging double or reinforced insulation between a.c. mains and antenna or coaxial cable		N
1.5.8	Components in equipment for IT power systems		N
1.5.9	Surge suppressors		N
1.5.9.1	General		N
1.5.9.2	Protection of VDRs		N
1.5.9.3	Bridging of functional insulation by a VDR		N
1.5.9.4	Bridging of basic insulation by a VDR		N
1.5.9.5	Bridging of supplementary, double or reinforced insulation by a VDR		N
1.6	Power interface		P
1.6.1	AC power distribution systems		N
1.6.2	Input current	(see appended table 1.6.2)	P

EN 60950-1			
Clause	Requirement	Remark	Result
1.6.3	Voltage limit of hand-held equipment		N
1.6.4	Neutral conductor		N
1.7	Marking and instructions		P
1.7.1	Power rating		P
	Multiple mains supply connections (IEC/EN 60950-1 /A1)		N
	Rated voltage(s) or voltage range(s) (V) :	5VDC	P
	Symbol for nature of supply, for d.c. only:	⎓	P
	Rated frequency or rated frequency range (Hz) :		N
1.7.1.2	Identification markings(IEC/EN 60950-1 /A1)		P
	Rated current (Ma or A) :	2A	P
	Manufacturer's name or trade-mark or identification mark :	see copy of marking plate	P
	Model identification or type reference :	see copy of marking plate	P
	Symbol for Class II equipment only :		N
	Other markings and symbols:	Other symbols do not give rise to misunderstanding.	P
1.7.1.3	Use of graphical symbols		P
1.7.2	Safety instructions and marking	English	P
1.7.2.1	General	Considered.	P
1.7.2.2	Disconnect devices		N
1.7.2.3	Overcurrent protective device		N
1.7.2.4	IT power distribution systems		N
1.7.2.5	Operator access with a tool		N
1.7.2.6	Ozone		N
1.7.3	Short duty cycles		N
1.7.4	Supply voltage adjustment :		N
	Methods and means of adjustment; reference to installation instructions :		N
1.7.5	Power outlets on the equipment :		N
1.7.6	Fuse identification (marking, special fusing characteristics, cross-reference) ..... :		N
1.7.7	Wiring terminals		N
1.7.7.1	Protective earthing and bonding terminals ..... :		N
1.7.7.2	Terminals for a.c. mains supply conductors		N
1.7.7.3	Terminals for d.c. mains supply conductors		N
1.7.8	Controls and indicators		P
1.7.8.1	Identification, location and marking ..... :		P
1.7.8.2	Colours ..... :		P

EN 60950-1			
Clause	Requirement	Remark	Result

1.7.8.3	Symbols according to IEC 60417 ..... :		N
1.7.8.4	Markings using figures ..... :		N
1.7.9	Isolation of multiple power sources ..... :		N
1.7.10	Thermostats and other regulating devices ..... :		N
1.7.11	Durability	The label was subjected to the permanence of marking test. The label was rubbed with cloth soaked with water for 15 s and then again for 15 s with the cloth soaked with petroleum spirit. After this test there was no damage to the label. The marking on the label did not fade. There was no curling nor lifting of the label edge.	P
1.7.12	Removable parts		N
1.7.13	Replaceable batteries ..... :		N
	Language(s) .....:	English	N
1.7.14	Equipment for restricted access locations..... :		N

2	PROTECTION FROM HAZARDS		P
2.1	Protection from electric shock and energy hazards		P
2.1.1	Protection in operator access areas	Class III equipment, no energy hazard in operator access areas	P
2.1.1.1	Access to energized parts		N
	Test by inspection:		N
	Test with test finger (Figure 2A) ..... :		N
	Test with test pin (Figure 2B) ..... :		N
	Test with test probe (Figure 2C) ..... :		N
2.1.1.2	Battery compartments		N
2.1.1.3	Access to ELV wiring		N
	Working voltage (Vpeak or Vrms); minimum distance through insulation (mm)		N
2.1.1.4	Access to hazardous voltage circuit wiring		N
2.1.1.5	Energy hazards .....:	See appended table 2.1.1.5	P
2.1.1.6	Manual controls		N
2.1.1.7	Discharge of capacitors in equipment		N
	Measured voltage (V); time-constant (s):		N
2.1.1.8	Energy hazards – d.c. mains supply		N
	a) Capacitor connected to the d.c. mains supply . :		N
	b) Internal battery connected to the d.c. mains supply ..... :		N
2.1.1.9	Audio amplifiers ..... :		N

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Clause	Requirement	Remark	Result
2.1.2	Protection in service access areas		N
2.1.3	Protection in restricted access locations		N
2.2	SELV circuits		P
2.2.1	General requirements		P
2.2.2	Voltages under normal conditions (V) ..... :	Within SELV limits	P
2.2.3	Voltages under fault conditions (V) ..... :	Within SELV limits	P
2.2.4	Connection of SELV circuits to other circuits ..... :		N
2.3	TNV circuits		N
2.3.1	Limits		N
	Type of TNV circuits .....:		N
2.3.2	Separation from other circuits and from accessible parts		N
2.3.2.1	General requirements		N
2.3.2.2	Protection by basic insulation		N
2.3.2.3	Protection by earthing		N
2.3.2.4	Protection by other constructions ..... :		N
2.3.3	Separation from hazardous voltages		N
	Insulation employed..... :		N
2.3.4	Connection of TNV circuits to other circuits		N
	Insulation employed..... :		N
2.3.5	Test for operating voltages generated externally		N
2.4	Limited current circuits		N
2.4.1	General requirements		N
2.4.2	Limit values		N
	Frequency (KHz)..... :		N
	Measured current (Ma) ..... :		N
	Measured voltage (V) ..... :		N
	Measured circuit capacitance (nF or μF)..... :		N
2.4.3	Connection of limited current circuits to other circuits		N
2.5	Limited power sources		P
	a) Inherently limited output		N
	b) Impedance limited output		N
	c) Regulating network limited output under normal operating and single fault condition	(see appended table 2.5)	P

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Clause	Requirement	Remark	Result
	d) Overcurrent protective device limited output		N
	Max. Output voltage (V), max. Output current (A), max. Apparent power (VA) ..... :	(see appended table 2.5)	N
	Current rating of overcurrent protective device (A) .:		N
2.6	Provisions for earthing and bonding		N
2.6.1	Protective earthing	Class III appliance	N
2.6.2	Functional earthing		N
2.6.3	Protective earthing and protective bonding conductors		N
2.6.3.1	General		N
2.6.3.2	Size of protective earthing conductors		N
	Rated current (A), cross-sectional area (mm^2), AWG ..... :		N
2.6.3.3	Size of protective bonding conductors		N
	Rated current (A), cross-sectional area (mm^2), AWG ..... :		N
	Protective current rating (A), cross-sectional area (mm^2), AWG..... :		N
2.6.3.4	Resistance of earthing conductors and their terminations; resistance (Ω), voltage drop (V), test current (A), duration (min)..... :		N
2.6.3.5	Colour of insulation ..... :		N
2.6.4	Terminals		N
2.6.4.1	General		N
2.6.4.2	Protective earthing and bonding terminals		N
	Rated current (A), type, nominal thread diameter (mm)..... :		N
2.6.4.3	Separation of the protective earthing conductor from protective bonding conductors		N
2.6.5	Integrity of protective earthing		N
2.6.5.1	Interconnection of equipment		N
2.6.5.2	Components in protective earthing conductors and protective bonding conductors		N
2.6.5.3	Disconnection of protective earth		N
2.6.5.4	Parts that can be removed by an operator		N
2.6.5.5	Parts removed during servicing		N
2.6.5.6	Corrosion resistance		N
2.6.5.7	Screws for protective bonding		N
2.6.5.8	Reliance on telecommunication network or cable distribution system		N

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Clause	Requirement	Remark	Result

2.7	Overcurrent and earth fault protection in primary circuits		N
2.7.1	Basic requirements		N
	Instructions when protection relies on building installation		N
2.7.2	Faults not simulated in 5.3.7		N
2.7.3	Short-circuit backup protection		N
2.7.4	Number and location of protective devices ..... :		N
2.7.5	Protection by several devices		N
2.7.6	Warning to service personnel ..... :		N
2.8	Safety interlocks		N
2.8.1	General principles		N
2.8.2	Protection requirements		N
2.8.3	Inadvertent reactivation		N
2.8.4	Fail-safe operation		N
	Protection against extreme hazard (IEC/EN 60950-1 /A1)		N
2.8.5	Moving parts		N
2.8.6	Overriding		N
2.8.7	Switches and relays		N
	Switches and relays and their related circuits (IEC/EN 60950-1 /A1)		N
2.8.7.1	Separation distances for contact gaps and their related circuits (mm) (IEC/EN 60950-1 /A1)..... :		N
2.8.7.2	Overload test		N
2.8.7.3	Endurance test		N
2.8.7.4	Electric strength test		N
2.8.8	Mechanical actuators		N

2.9	Electrical insulation		N
2.9.1	Properties of insulating materials	Class III appliance	N
2.9.2	Humidity conditioning		N
	Relative humidity (%), temperature (°C) ..... :		N
2.9.3	Grade of insulation		N
2.9.4	Separation from hazardous voltages		N
	Method(s) used ..... :		N

2.10	Clearances, creepage distances and distances through insulation		N
2.10.1	General	Class III appliance	N
2.10.1.1	Frequency ..... :		N

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Clause	Requirement	Remark	Result
2.10.1.2	Pollution degrees ..... :		N
2.10.1.3	Reduced values for functional insualtion		N
2.10.1.4	Intervening unconnected conductive parts		—
2.10.1.5	Insulation with varying dimensions		N
2.10.1.6	Special separation requirements		N
2.10.1.7	Insulation in circuits generating starting pulses		N
2.10.2	Determination of working voltage		N
2.10.2.1	General		N
2.10.2.2	RMS working voltage		N
2.10.2.3	Peak working voltage		N
2.10.3	Clearances		N
2.10.3.1	General		N
2.10.3.2	Mains transient voltages		N
	a) AC mains supply ..... :		N
	b) Earthed d.c. mains supplies ..... :		N
	c) Unearthed d.c. mains supplies ..... :		N
	d) Battery operation ..... :		N
2.10.3.3	Clearances in primary circuits		N
2.10.3.4	Clearances in secondary circuits		N
2.10.3.5	Clearances in circuits having starting pulses		N
2.10.3.6	Transients from a.c. mains supply ..... :		N
2.10.3.7	Transients from d.c. mains supply ..... :		N
2.10.3.8	Transients from telecommunication networks and cable distribution systems ..... :		N
2.10.3.9	Measurement of transient voltage levels		N
	a) Transients from a mains suplply		N
	For an a.c. mains supply ..... :		N
	For a d.c. mains supply ..... :		N
	b) Transients from a telecommunication network :		N
2.10.4	Creepage distances		N
2.10.4.1	General		N
2.10.4.2	Material group and caomparative tracking index		N
	CTI tests..... :		N
2.10.4.3	Minimum creepage distances		N
2.10.5	Solid insulation		N
2.10.5.1	General		N
2.10.5.2	Distances through insulation		N
2.10.5.3	Insulating compound as solid insulation		N
2.10.5.4	Semiconductor devices		N

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Clause	Requirement	Remark	Result
2.10.5.5.	Cemented joints		N
2.10.5.6	Thin sheet material – General		N
2.10.5.7	Separable thin sheet material		N
	Number of layers (pcs) ..... :		N
2.10.5.8	Non-separable thin sheet material		N
2.10.5.9	Thin sheet material – standard test procedure		N
	Electric strength test		N
2.10.5.10	Thin sheet material – alternative test procedure		N
	Electric strength test		N
2.10.5.11	Insulation in wound components		N
2.10.5.12	Wire in wound components		N
	Working voltage ..... :		N
	a) Basic insulation not under stress ..... :		N
	b) Basic, supplemetary, reinforced insulation ..... :		N
	c) Compliance with Annex U ..... :		N
	Two wires in contact inside wound component; angle between 45° and 90° ..... :		N
2.10.5.13	Wire with solvent-based enamel in wound components		N
	Electric strength test		N
	Routine test		N
2.10.5.14	Additional insulation in wound components		N
	Working voltage ..... :		N
	- Basic insulation not under stress ..... :		N
	- Supplemetary, reinforced insulation ..... :		N
2.10.6	Construction of printed boards		N
2.10.6.1	Uncoated printed boards		N
2.10.6.2	Coated printed boards		N
2.10.6.3	Insulation between conductors on the same inner surface of a printed board		N
2.10.6.4	Insulation between conductors on different layers of a printed board		N
	Distance through insulation		N
	Number of insulation layers (pcs) ..... :		N
2.10.7	Component external terminations	.	N
2.10.8	Tests on coated printed boards and coated components		N
2.10.8.1	Sample preparation and preliminary inspection		N
2.10.8.2	Thermal conditioning		N
2.10.8.3	Electric strength test		N

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Clause	Requirement	Remark	Result
2.10.8.4	Abrasion resistance test		N
2.10.9	Thermal cycling		N
2.10.10	Test for Pollution Degree 1 environment and insulating compound		N
2.10.11	Tests for semiconductor devices and cemented joints		N
2.10.12	Enclosed and sealed parts		N
3	WIRING, CONNECTIONS AND SUPPLY		N
3.1	General		N
3.1.1	Current rating and overcurrent protection		N
3.1.2	Protection against mechanical damage		N
3.1.3	Securing of internal wiring		N
3.1.4	Insulation of conductors		N
3.1.5	Beads and ceramic insulators		N
3.1.6	Screws for electrical contact pressure		N
3.1.7	Insulating materials in electrical connections		N
3.1.8	Self-tapping and spaced thread screws		N
3.1.9	Termination of conductors		N
	10 N pull test		N
3.1.10	Sleeving on wiring		N
3.2	Connection to a mains supply		N
3.2.1	Means of connection	Class III appliance	N
3.2.1.1	Connection to an a.c. mains supply		N
3.2.1.2	Connection to a d.c. mains supply		N
3.2.2	Multiple supply connections		N
3.2.3	Permanently connected equipment		N
	Number of conductors, diameter of cable and conduits (mm) .....:		N
3.2.4	Appliance inlets		N
3.2.5	Power supply cords		N
3.2.5.1	AC power supply cords		N
	Type .....:		N
	Rated current (A), cross-sectional area (mm^2), AWG:		N
3.2.5.2	DC power supply cords		N
3.2.6	Cord anchorages and strain relief		N
	Mass of equipment (kg), pull (N) .....:		N
	Longitudinal displacement (mm) .....:		N

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Clause	Requirement	Remark	Result
3.2.7	Protection against mechanical damage		N
3.2.8	Cord guards		N
	Diameter or minor dimension D (mm); test mass (g) .....:		N
	Radius of curvature of cord (mm) .....:		N
3.2.9	Supply wiring space		N
3.3	Wiring terminals for connection of external conductors		N
3.3.1	Wiring terminals		N
3.3.2	Connection of non-detachable power supply cords		N
3.3.3	Screw terminals		N
3.3.4	Conductor sizes to be connected		N
	Rated current (A), cord/cable type, cross-sectional area (mm^2) .....:		N
3.3.5	Wiring terminal sizes		N
	Rated current (A), type, nominal thread diameter (mm) .....:		N
3.3.6	Wiring terminal design		N
3.3.7	Grouping of wiring terminals		N
3.3.8	Stranded wire		N
3.4	Disconnection from the mains supply		N
3.4.1	General requirement	Class III appliance	N
3.4.2	Disconnect devices		N
3.4.3	Permanently connected equipment		N
3.4.4	Parts which remain energized		N
3.4.5	Switches in flexible cords		N
3.4.6	Number of poles – single-phase and d.c. equipment		N
3.4.7	Number of poles – three-phase equipment		N
3.4.8	Switches as disconnect devices		N
3.4.9	Plugs as disconnect devices		N
3.4.10	Interconnected equipment		N
3.4.11	Multiple power sources		N
3.5	Interconnection of equipment		N
3.5.1	General requirements		N
3.5.2	Types of interconnection circuits .....:		N
3.5.3	ELV circuits as interconnection circuits		N
3.5.4	Data ports for additional equipment		N

EN 60950-1			
Clause	Requirement	Remark	Result

4	PHYSICAL REQUIREMENTS		P
4.1	Stability		N
	Angle of 10°	<7kg	N
	Test force (N) ..... :		N
4.2	Mechanical strength		N
4.2.1	General		N
	Rack-mounted equipment (IEC/EN 60950-1 /A1)		N
4.2.2	Steady force test, 10 N		N
4.2.3	Steady force test, 30 N		N
4.2.4	Steady force test, 250 N		N
4.2.5	Impact test		N
	Fall test		N
	Swing test		N
4.2.6	Drop test; height (mm) ..... :		N
4.2.7	Stress relief test		N
4.2.8	Cathode ray tubes		N
	Picture tube separately certified ..... :		N
4.2.9	High pressure lamps		N
4.2.10	Wall or ceiling mounted equipment; force (N) ..... :		N
4.2.11	Rotating solid media (IEC/EN 60950-1 /A1)		N
	Test to cover on the door.....		N

4.3	Design and construction		P
4.3.1	Edges and corners	All edges and corners are rounded and/or smoothed.	P
4.3.2	Handles and manual controls; force (N).....:		N
4.3.3	Adjustable controls		N
4.3.4	Securing of parts	No loosening of parts impairing creepage distances or clearances is likely to occur.	P
4.3.5	Connection by plugs and sockets		N
4.3.6	Direct plug-in equipment		N
	Torque ..... :		N
	Compliance with the relevant mains plug standard ..... :		N
4.3.7	Heating elements in earthed equipment		N
4.3.8	Batteries		N

EN 60950-1			
Clause	Requirement	Remark	Result
	- Overcharging of a rechargeable battery		N
	- Unintentional charging of a non-rechargeable battery		N
	- Reverse charging of a rechargeable battery		N
	- Excessive discharging rate for any battery		N
4.3.9	Oil and grease		N
4.3.10	Dust, powders, liquids and gases		N
4.3.11	Containers for liquids or gases		N
4.3.12	Flammable liquids ..... :		N
	Quantity of liquid (l) ..... :		N
	Flash point (°C) ..... :		N
4.3.13	Radiation		N
4.3.13.1	General		N
4.3.13.2	Ionizing radiation		N
	Measured radiation (Pa/kg) ..... :		N
	Measured high-voltage (Kv) ..... :		N
	Measured focus voltage (Kv) ..... :		N
	CRT markings ..... :		N
4.3.13.3	Effect of ultraviolet (UV) radiation on materials		N
	Part, property, retention after test, flammability classification ..... :		N
4.3.13.4	Human exposure to ultraviolet (UV) radiation ..... :		N
4.3.13.5	Laser (including LEDs)	Indicating lights	N
	Laser class ..... :		N
4.3.13.6	Other types ..... :		N

4.4	Protection against hazardous moving parts		N
4.4.1	General		N
4.4.2	Protection in operator access areas ..... :		N
4.4.3	Protection in restricted access locations ..... :		N
4.4.4	Protection in service access areas		N
4.4.5	Protection against moving fan blades (IEC/EN 60950-1 /A1)		N
4.4.5.1	General		N
	Not considered to cause pain or injury. a)…….:		N
	Is considered to cause pain, not injury b) ……:		N
	Considered to cause injury c) ……..…:		N
4.4.5.2	Protection for users		N
	Use of symbol or warning ……:		N
4.4.5.3	Protection for service persons		N

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Clause	Requirement	Remark	Result
	Use of symbol or warning ……:		N
4.5	Thermal requirements		P
4.5.1	General	See below.	P
4.5.2	Temperature tests	(See appended table 4.5)	P
	Normal load condition per Annex L :		P
4.5.3	Temperature limits for materials	(see appended table 4.5)	P
4.5.4	Touch temperature limits		P
4.5.5	Resistance to abnormal heat ..... :		N
4.6	Openings in enclosures		N
4.6.1	Top and side openings		N
	Dimensions (mm) ..... :		N
4.6.2	Bottoms of fire enclosures		N
	Construction of the bottomm, dimensions (mm) .. :		N
4.6.3	Doors or covers in fire enclosures		N
4.6.4	Openings in transportable equipment		N
4.6.4.1	Constructional design measures		N
	Dimensions (mm) ..... :		N
4.6.4.2	Evaluation measures for larger openings		N
4.6.4.3	Use of metallized parts		N
4.6.5	Adhesives for constructional purposes		N
	Conditioning temperature (°C), time (weeks) ..... :		N
4.7	Resistance to fire		P
4.7.1	Reducing the risk of ignition and spread of flame	Method 1 used	P
	Method 1, selection and application of components wiring and materials	(see appended table 4.7)	P
	Method 2, application of all of simulated fault condition tests		N
4.7.2	Conditions for a fire enclosure		N
4.7.2.1	Parts requiring a fire enclosure		N
4.7.2.2	Parts not requiring a fire enclosure		N
4.7.3	Materials		P
4.7.3.1	General	PCB rated accordingly. See appended table 1.5.1 for details	P
4.7.3.2	Materials for fire enclosures		N
4.7.3.3	Materials for components and other parts outside fire enclosures		N

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Clause	Requirement	Remark	Result
4.7.3.4	Materials for components and other parts inside fire enclosures	PCB are rated V-0. See appended table 1.5.1 for details. Internal components except small parts are V-2 or better	P
4.7.3.5	Materials for air filter assemblies	No air filters assemblies	N
4.7.3.6	Materials used in high-voltage components	No high voltage component	N
5	ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS		P
5.1	Touch current and protective conductor current		N
5.1.1	General		N
5.1.2	Configuration of equipment under test (EUT)		N
5.1.2.1	Single connection to an a.c. mains supply		N
5.1.2.2	Redundant multiple connections to an a.c. mains supply		N
5.1.2.3	Simultaneous multiple connections to an a.c. mains supply		N
5.1.3	Test circuit	Equipment of figure 5A used	N
5.1.4	Application of measuring instrument		N
5.1.5	Test procedure		N
5.1.6	Test measurements		N
	Supply voltage (V) ..... :		N
	Measured touch current (Ma) ..... :		N
	Max. Allowed touch current (Ma) ..... :		N
	Measured protective conductor current (Ma) ..... :		N
	Max. Allowed protective conductor current (Ma).. :		N
5.1.7	Equipment with touch current exceeding 3,5 Ma		N
5.1.7.1	General ..... :		N
5.1.7.2	Simultaneous multiple connections to the supply		N
5.1.8	Touch currents to telecommunication networks and cable distribution systems and from telecommunication networks		N
5.1.8.1	Limitation of the touch current to a telecommunication network or to a cable distribution system		N
	Supply voltage (V) ..... :		N
	Measured touch current (Ma) ..... :		N
	Max. Allowed touch current (Ma) ..... :		N
5.1.8.2	Summation of touch currents from telecommunication networks		N
	a) EUT with earthed telecommunication ports .... :		N
	b) EUT whose telecommunication ports have no reference to protective earth		N

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Clause	Requirement	Remark	Result

5.2	Electric strength		N
5.2.1	General	See appended table 5.2	N
5.2.2	Test procedure	See appended table 5.2	N

5.3	Abnormal operating and fault conditions		P
5.3.1	Protection against overload and abnormal operation	See appended table 5.3	P
5.3.2	Motors		N
5.3.3	Transformers		N
5.3.4	Functional insulation ..... :	See appended table 5.3. Complies with c)	P
5.3.5	Electromechanical components		N
5.3.6	Audio amplifiers in ITE ..... :		N
5.3.7	Simulation of faults	See appended table 5.3	P
5.3.8	Unattended equipment		N
5.3.9	Compliance criteria for abnormal operating and fault conditions	No flame emitted, no molten material emitted, no deformation of enclosure	P
5.3.9.1	During the tests	No fire propagated beyond the equipment. No molten metal was emitted.	P
5.3.9.2	After the tests		N

6	CONNECTION TO TELECOMMUNICATION NETWORKS		N
6.1	Protection of telecommunication network service persons, and users of other equipment connected to the network, from hazards in the equipment		N
6.1.1	Protection from hazardous voltages		N
6.1.2	Separation of the telecommunication network from earth		N
6.1.2.1	Requirements	No TNV circuit.	N
	Supply voltage (V) ..... :		N
	Current in the test circuit (Ma) ..... :		N
6.1.2.2	Exclusions ..... :		N

6.2	Protection of equipment users from overvoltages on telecommunication networks		N
6.2.1	Separation requirements		N
6.2.2	Electric strength test procedure		N
6.2.2.1	Impulse test		N
6.2.2.2	Steady-state test		N
6.2.2.3	Compliance criteria		N

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Clause	Requirement	Remark	Result
6.3	Protection of the telecommunication wiring system from overheating		N
	Max. Output current (A) ..... :		N
	Current limiting method ..... :		N
7	CONNECTION TO CABLE DISTRIBUTION SYSTEMS		N
7.1	General		N
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
7.3	Protection of equipment users from overvoltages on the cable distribution system		N
7.4	Insulation between primary circuits and cable distribution systems		N
7.4.1	General		N
7.4.2	Voltage surge test		N
7.4.3	Impulse test		N
A	ANNEX A, TESTS FOR RESISTANCE TO HEAT AND FIRE		N
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)	Not connected to Cable Distribution System.	N
A.1.1	Samples ..... :		N
	Wall thickness (mm) ..... :		N
A.1.2	Conditioning of samples; temperature (°C) ..... :		N
A.1.3	Mounting of samples ..... :		N
A.1.4	Test flame (see IEC 60695-11-3)		N
	Flame A, B, C or D ..... :		N
A.1.5	Test procedure		N
A.1.6	Compliance criteria		N
	Sample 1 burning time (s)..... :		N
	Sample 2 burning time (s)..... :		N
	Sample 3 burning time (s)..... :		N
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.2.1	Samples, material ..... :		N
	Wall thickness (mm) ..... :		N
A.2.2	Conditioning of samples; temperature (°C) ..... :		N
A.2.3	Mounting of samples ..... :		N
A.2.4	Test flame (see IEC 60695-11-4)		N

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Clause	Requirement	Remark	Result
	Flame A, B or C ..... :		N
A.2.5	Test procedure		N
A.2.6	Compliance criteria		N
	Sample 1 burning time (s)..... :		N
	Sample 2 burning time (s)..... :		N
	Sample 3 burning time (s)..... :		N
A.2.7	Alternative test acc. To IEC 60695-11-5, cl. 5 and 9		N
	Sample 1 burning time (s)..... :		N
	Sample 2 burning time (s)..... :		N
	Sample 3 burning time (s)..... :		N
A.3	Hot flaming oil test (see 4.6.2)		N
A.3.1	Mounting of samples		N
A.3.2	Test procedure		N
A.3.3	Compliance criterion		N
B	ANNEX B, MOTOR TESTS UNDER ABNORMAL CONDITIONS (see 4.7.2.2 and 5.3.2)		N
B.1	General requirements		N
	Position ..... :		N
	Manufacturer ..... :		N
	Type ..... :		N
	Rated values ..... :		N
B.2	Test conditions		N
B.3	Maximum temperatures		N
B.4	Running overload test		N
B.5	Locked-rotor overload test		N
	Test duration (days) ..... :		N
	Electric strength test: test voltage (V) ..... :		N
B.6	Running overload test for d.c. motors in secondary circuits		N
B.6.1	General		N
B.6.2	Test procedure		N
B.6.3	Alternative test procedure		N
B.6.4	Electric strength test; test voltage (V) ..... :		N
B.7	Locked-rotor overload test for d.c. motors in secondary circuits		N
B.7.1	General		N
B.7.2	Test procedure		N
B.7.3	Alternative test procedure		N

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Clause	Requirement	Remark	Result
B.7.4	Electric strength test; test voltage (V) ..... :		N
B.8	Test for motors with capacitors		N
B.9	Test for three-phase motors		N
B.10	Test for series motors		N
	Operating voltage (V) ..... :		N
C	ANNEX C, TRANSFORMERS (see 1.5.4 and 5.3.3)		N
	Position ..... :		N
	Manufacturer ..... :	See table 1.5.1	N
	Type ..... :	See table 1.5.1	N
	Rated values ..... :	See table 1.5.1	N
	Method of protection ..... :		N
C.1	Overload test		N
C.2	Insulation		N
	Protection from displacement of windings ..... :		N
D	ANNEX D, MEASURING INSTRUMENTS FOR TOUCH-CURRENT TESTS (see 5.1.4)		N
D.1	Measuring instrument		N
D.2	Alternative measuring instrument		N
E	ANNEX E, TEMPERATURE RISE OF A WINDING (see 1.4.13)		N
F	ANNEX F, MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES (see 2.10 and Annex G)		N
G	ANNEX G, ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES		N
G.1	Clearances		N
G.1.1	General		N
G.1.2	Summary of the procedure for determining minimum clearances		N
G.2	Determination of mains transient voltage (V)		N
G.2.1	AC mains supply ..... :		N
G.2.2	Earthed d.c. mains supplies ..... :		N
G.2.3	Unearthed d.c. mains supplies ..... :		N
G.2.4	Battery operation ..... :		N
G.3	Determination of telecommunication network transient voltage (V) ..... :		N
G.4	Determination of required withstand voltage (V)		N

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Clause	Requirement	Remark	Result
G.4.1	Mains transients and internal repetitive peaks .... :		N
G.4.2	Transients from telecommunication networks ..... :		N
G.4.3	Combination of transients		N
G.4.4	Transients from cable distribution systems		N
G.5	Measurement of transient voltages (V)		N
	a) Transients from a mains supply		N
	For an a.c. mains supply		N
	For a d.c. mains supply		N
	b) Transients from a telecommunication network		N
G.6	Determination of minimum clearances ..... :		N
H	ANNEX H, IONIZING RADIATION (see 4.3.13)		N
J	ANNEX J, TABLE OF ELECTROCHEMICAL POTENTIALS (see 2.6.5.6)		N
	Metal(s) used ..... :		N
K	ANNEX K, THERMAL CONTROLS (see 1.5.3 and 5.3.8)		N
K.1	Making and breaking capacity		N
K.2	Thermostat reliability; operating voltage (V) ..... :		N
K.3	Thermostat endurance test; operating voltage (V) ..... :		N
K.4	Temperature limiter endurance; operating voltage (V) ..... :		N
K.5	Thermal cut-out reliability		N
K.6	Stability of operation	(see appended table 5.3)	N
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
L.2	Adding machines and cash registers		N
L.3	Erasers		N
L.4	Pencil sharpeners		N
L.5	Duplicators and copy machines		N
L.6	Motor-operated files		N
L.7	Other business equipment		P
M	ANNEX M, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1)		N
M.1	Introduction		N
M.2	Method A		N
M.3	Method B		N

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Clause	Requirement	Remark	Result
M.3.1	Ringing signal		N
M.3.1.1	Frequency (Hz) ..... :		N
M.3.1.2	Voltage (V) ..... :		N
M.3.1.3	Cadence; time (s), voltage (V) ..... :		N
M.3.1.4	Single fault current (Ma) ..... :		N
M.3.2	Tripping device and monitoring voltage ..... :		N
M.3.2.1	Conditions for use of a tripping device or a monitoring voltage		N
M.3.2.2	Tripping device		N
M.3.2.3	Monitoring voltage (V) ..... :		N
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
N.1	ITU-T impulse test generators		N
N.2	IEC 60065 impulse test generator		N
P	ANNEX P, NORMATIVE REFERENCES		N
Q	ANNEX Q, Voltage dependent resistors (VDRs) (see 1.5.9.1)		N
	a) Preferred climatic categories ..... :		N
	b) Maximum continuous voltage ..... :		N
	c) Pulse current ..... :		N
R	ANNEX R, EXAMPLES OF REQUIREMENTS FOR QUALITY CONTROL PROGRAMMES		N
R.1	Minimum separation distances for unpopulated coated printed boards (see 2.10.6.2)		N
R.2	Reduced clearances (see 2.10.3)		N
S	ANNEX S, PROCEDURE FOR IMPULSE TESTING (see 6.2.2.3)		N
S.1	Test equipment		N
S.2	Test procedure		N
S.3	Examples of waveforms during impulse testing		N
T	ANNEX T, GUIDANCE ON PROTECTION AGAINST INGRESS OF WATER (see 1.1.2)		N
			N
U	ANNEX U, INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION (see 2.10.5.4)		N
			N

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Clause	Requirement	Remark	Result

V	ANNEX V, AC POWER DISTRIBUTION SYSTEMS (see 1.6.1)		N
V.1	Introduction		N
V.2	TN power distribution systems		N

W	ANNEX W, SUMMATION OF TOUCH CURRENTS		N
W.1	Touch current from electronic circuits		N
W.1.1	Floating circuits		N
W.1.2	Earthed circuits		N
W.2	Interconnection of several equipments		N
W.2.1	Isolation		N
W.2.2	Common return, isolated from earth		N
W.2.3	Common return, connected to protective earth		N

X	ANNEX X, MAXIMUM HEATING EFFECT IN TRANSFORMER TESTS (see clause C.1)		N
X.1	Determination of maximum input current		N
X.2	Overload test procedure		N

Y	ANNEX Y, ULTRAVIOLET LIGHT CONDITIONING TEST (see 4.3.13.3)		N
Y.1	Test apparatus ..... :		N
Y.2	Mounting of test samples ..... :		N
Y.3	Carbon-arc light-exposure apparatus ..... :		N
Y.4	Xenon-arc light exposure apparatus ..... :		N

Z	ANNEX Z, OVERVOLTAGE CATEGORIES (see 2.10.3.2 and Clause G.2)		N

AA	ANNEX AA, MANDREL TEST (see 2.10.5.8)		N

BB	ANNEX BB, CHANGES IN THE SECOND EDITION		N

CC	Annex CC, Evaluation of integrated circuit (IC) current limiters		N
CC.1	General		N
CC.2	Test program 1……..:		N
CC.3	Test program 2……..:		N

DD	Annex DD, Requirements for the mounting means of rack-mounted equipment		N
DD.1	General		N
DD.2	Mechanical strength test, variable N……..:		N

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Clause	Requirement	Remark	Result
DD.3	Mechanical strength test, 250N, including end stops……:		N
DD.4	Compliance……:		N

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

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Clause	Requirement	Remark	Result

IEC 60950-1:2005/A2:2013– CENELEC COMMON MODIFICATIONS		
Contents (A2:2013)	Add the following annexes: Annex ZA (normative) Normative references to international publications with their corresponding European publications Annex ZB (normative) Special national conditions Annex ZD (informative) IEC and CENELEC code designations for flexible cords	P
General	Delete all the “country” notes in the reference document according to the following list: 1.4.8 Note 2; 1.5.1 Note 2 & 3; 1.5.7.1 Note 1.5.8 Note 2; 1.5.9.4 Note; 1.7.2.1 Note 4, 5 & 6 2.2.3 Note; 2.2.4 Note; 2.3.2 Note 2.3.2.1 Note 2; 2.3.4 Note 2; 2.6.3.3 Note 2 & 3 2.7.1 Note; 2.10.3.2 Note 2; 2.10.5.13 Note 3 3.2.1.1 Note; 3.2.4 Note 3.; 2.5.1 Note 2 4.3.6 Note 1 & 2; 4.7 Note 4; 4.7.2.2 Note 4.7.3.1 Note 2; 5.1.7.1 Note 3 & 4; 5.3.7 Note 1 6 Note 2 & 5; 6.1.2.1 Note 2; 6.1.2.2 Note 6.2.2 Note 6.; 2.2.1 Note 2; 6.2.2.2 Note 7.1 Note 3; 7.2 Note; 7.3 Note 1 & 2 G.2.1 Note 2; Annex H Note 2	P
General (A1:2010)	Delete all the “country” notes in the reference document (IEC 60950-1:2005/A1:2010) according to the following list: 1.5.7.1 Note; 6.1.2.1 Note 2 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: 2.7.1 Note *; 2.10.3.1 Note 2 6.2.2. Note * Note of secretary: Text of Common Modification remains unchanged.	P
1.1.1 (A1:2010)	**Replace** the text of NOTE 3 by the following. 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.	N
1.3.Z1	Add the following subclause: 1.3.Z1 Exposure to excessive sound pressure 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. 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

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Clause	Requirement	Remark	Result

(A12:2011)	In EN 60950-1:2006/A12:2011 Delete the addition of 1.3.Z1 / EN 60950-1:2006 Delete the definition 1.2.3.Z1 / EN 60950-1:2006 /A1:2010	N
1.5.1 (Added info*)	Add the following NOTE: NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2002/95/EC New Directive 2011/65/11 *	N
1.7.2.1 (A1:2010)	Add the following NOTE: NOTE Z1 In addition, the instructions shall include, as far as applicable, a warning that excessive sound pressure from earphones and headphones can cause hearing loss	N
1.7.2.1 (A12.2011)	In EN 60950-1:2006/A12:2011 Delete NOTE Z1 and the addition for Portable Sound System. Add the following clause and annex to the existing standard and amendments.	N
	Zx Protection against excessive sound pressure from personal music players	N
	Zx.1 General 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. A personal music player is a portable equipment for personal use, that: – is designed to allow the user to listen to recorded or broadcast sound or video; and – primarily uses headphones or earphones that can be worn in or on or around the ears; and – allows the user to walk around while in use. 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. 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. The requirements in this sub-clause are valid for music or video mode only. The requirements do not apply: – while the personal music player is connected to an external amplifier; or – while the headphones or earphones are not used. 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. The requirements do not apply to: – hearing aid equipment and professional equipment; 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
	– 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. 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. For equipment which is clearly designed or intended for use by young children, the limits of EN 71-1 apply.	N

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Clause	Requirement	Remark	Result
	Zx.2 Equipment requirements No safety provision is required for equipment that complies with the following: – equipment provided as a package (personal music player with its listening device), where the acoustic output $L_{Aeq,T}$ is ≤ 85 dBA measured while playing the fixed “programme simulation noise” as described in EN 50332-1; and – 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. NOTE 1 Wherever the term acoustic output is used in this clause, the 30 s A-weighted equivalent sound pressure level $L_{Aeq,T}$ is meant. See also Zx.5 and Annex Zx. All other equipment shall: a) protect the user from unintentional acoustic outputs exceeding those mentioned above; and b) have a standard acoustic output level not exceeding those mentioned above, and automatically return to an output level not exceeding those mentioned above when thepower is switched off; and		N
	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 NOTE 2 Examples of means include visual or audible signals. Action from the user is always required. 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. d) have a warning as specified in Zx.3; and e) not exceed the following: 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 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. For music where the average sound pressure (long term $L_{Aeq,T}$) 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. NOTE 4 Classical music typically has an average sound pressure (long term $L_{Aeq,T}$) 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. 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

EN 60950-1			
Clause	Requirement	Remark	Result
	Zx.3 Warning The warning shall be placed on the equipment, or on the packaging, or in the instruction manual and shall consist of the following: – the symbol of Figure 1 with a minimum height of 5 mm; and – the following wording, or similar: "To prevent possible hearing damage, do not listen at high volume levels for long periods."  **Figure 1 – Warning label (IEC 60417-6044)** 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
	Zx.4 Requirements for listening devices (headphones and earphones)		N
	Zx.4.1 Wired listening devices with analogue input 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. This requirement is applicable in any mode where the headphones can operate (active or passive), including any available setting (for example built-in volume level control). NOTE The values of 94 dBA – 75 mV correspond with 85dBA – 27 mV and 100 dBA – 150 mV.		N
	Zx.4.2 Wired listening devices with digital input 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 $L_{Aeq,T}$ of the listening device shall be ≤ 100 dBA. 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.). NOTE An example of a wired listening device with digital input is a USB headphone.		N

EN 60950-1			
Clause	Requirement	Remark	Result
	Zx.4.3 Wireless listening devices In wireless mode: – with any playing and transmitting device playing the fixed programme simulation noise described in EN 50332-1; and – respecting the wireless transmission standards, where an air interface standard exists that specifies the equivalent acoustic level; and – 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 $L_{Aeq,T}$ of the listening device shall be ≤ 100 dBA. NOTE An example of a wireless listening device is a Bluetooth headphone.		N
	Zx.5 Measurement methods 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. NOTE Test method for wireless equipment provided without listening device should be defined.		N
2.7.1	Replace the subclause as follows: Basic requirements 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): 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; 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; 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. 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
2.7.2	This subclause has been declared 'void'.		N
3.2.3	Delete the NOTE in Table 3A, and delete also in this table the conduit sizes in parentheses.		N
3.2.5.1	Replace "60245 IEC 53" by "H05 RR-F"; "60227 IEC 52" by "H03 VV-F or H03 VVH2-F"; "60227 IEC 53" by "H05 VV-F or H05 VVH2-F2". In Table 3B, replace the first four lines by the following: | Up to and including 6 | | 0,75 [a)] | | Over 6 up to and including 10 | (0,75) [b)] | 1,0 | | Over 10 up to and including 16 | (1,0) [c)] | 1,5 | In the conditions applicable to Table 3B delete the words "in some countries" in condition [a)]. In NOTE 1, applicable to Table 3B, delete the second sentence.		N

EN 60950-1			
Clause	Requirement	Remark	Result

3.2.5.1 (A2:2013)	NOTE Z1 The harmonised code designations corresponding to the IEC cord types are given in Annex ZD	
3.3.4	In Table 3D, delete the fourth line: conductor sizes for 10 to 13 A, and replace with the following: | Over 10 up to and including 16 | 1,5 to 2,5 | 1,5 to 4 | Delete the fifth line: conductor sizes for 13 to 16 A.	N
4.3.13.6 (A1:2010)	Add the following NOTE: NOTE Z1 Attention is drawn to 1999/519/EC: Council Recommendation on the limitation of exposure of the general public to electromagnetic fields 0 Hz to 300 GHz. Standards taking into account this Recommendation which demonstrate compliance with the applicable EU Directive are indicated in the OJEC.	N
Annex H	Replace the last paragraph of this annex by: 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. Replace the notes as follows: NOTE These values appear in Directive 96/29/Euratom. Delete NOTE 2.	N
Biblio-graphy	Additional EN standards.	N

ZA	NORMATIVE REFERENCES TO INTERNATIONAL PUBLICATIONS WITH THEIR CORRESPONDING EUROPEAN PUBLICATIONS (EN 60950-1/A11)	N

ZB	SPECIAL NATIONAL CONDITIONS	N
1.2.13.14	**In Norway** and **Sweden,** for requirements see 1.7.2.1 and 7.3 of this annex. (EN 60950-1/A11)	N
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
1.5.7.1	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. (EN 60950-1/A11)	N
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
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

EN 60950-1			
Clause	Requirement	Remark	Result
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. The marking text in the applicable countries shall be as follows: In Finland: "Laite on liitettävä suojamaadoituskoskettimilla varustettuun pistorasiaan" In Norway: “Apparatet må tilkoples jordet stikkontakt” In Sweden: “Apparaten skall anslutas till jordat uttag”		N
1.7.2.1	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. 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. 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: "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)." 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. Translation to Norwegian (the Swedish text will also be accepted in Norway): "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." Translation to Swedish: "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." (EN 60950-1/A11)		N
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. The marking text in Denmark shall be as follows: In Denmark: “Apparatets stikprop skal tilsluttes en stikkontakt med jord, som giver forbindelse til stikproppens jord.”		N

EN 60950-1			
Clause	Requirement	Remark	Result

1.7.5	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.	N
1.7.5	For CLASS II EQUIPMENT the socket outlet shall be in accordance with Standard Sheet DKA1-4a. (EN 60950-1/A11)	N
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. 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. 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. Justification the Heavy Current Regulations, 6c	N
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
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
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
2.6.3.3	In the **United Kingdom**, the current rating of the circuit shall be taken as 13 A, not 16 A.	N
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
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
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: SEV 6532-2.1991 Plug Type 15 3P+N+PE 250/400 V, 10 A SEV 6533-2.1991 Plug Type 11 L+N 250 V, 10 A SEV 6534-2.1991 Plug Type 12 L+N+PE 250 V, 10 A 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: SEV 5932-2.1998 Plug Type 25 3L+N+PE 230/400 V, 16 A SEV 5933-2.1998 Plug Type 21 L+N 250 V, 16 A SEV 5934-2.1998 Plug Type 23 L+N+PE 250 V, 16 A	N

EN 60950-1			
Clause	Requirement	Remark	Result

3.2.1.1	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. 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. 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. Justification the Heavy Current Regulations, 6c	N
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. 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. 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. 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
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. 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
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
3.2.4	In **Switzerland**, for requirements see 3.2.1.1 of this annex.	N
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
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: • 1,25 mm^2 to 1,5 mm^2 nominal cross-sectional area.	N
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
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

EN 60950-1			
Clause	Requirement	Remark	Result
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: • STATIONARY PLUGGABLE EQUIPMENT TYPE A that ○ is intended to be used in a RESTRICTED ACCESS LOCATION where equipotential bonding has been applied, for example, in a telecommunication centre; and ○ has provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR; and ○ is provided with instructions for the installation of that conductor by a SERVICE PERSON; • STATIONARY PLUGGABLE EQUIPMENT TYPE B; • STATIONARY PERMANENTLY CONNECTED EQUIPMENT.		N
6.1.2.1	In **Finland**, **Norway** and **Sweden**, add the following text between the first and second paragraph of the compliance clause: If this insulation is solid, including insulation forming part of a component, it shall at least consist of either - two layers of thin sheet material, each of which shall pass the electric strength test below, or - one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below. If this insulation forms part of a semiconductor component (e.g. an optocoupler), there is no distance through insulation requirement for the insulation consisting of an insulating compound completely filling the casing, so that CLEARANCES and CREEPAGE DISTANCES do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition - 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 2.10.10 shall be performed using 1,5 kV), and - is subject to ROUTINE TESTING for electric strength during manufacturing, using a test voltage of 1,5 kV. It is permitted to bridge this insulation with a capacitor complying with EN 132400:1994, subclass Y2. A capacitor classified Y3 according to EN 132400:1994, may bridge this insulation under the following conditions: - the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 132400, 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; - the additional testing shall be performed on all the test specimens as described in EN 132400; - the impulse test of 2,5 kV is to be performed before the endurance test in EN 132400, in the sequence of tests as described in EN 132400.		N
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

EN 60950-1			
Clause	Requirement	Remark	Result

7.2	In **Finland**, **Norway** and **Sweden**, for requirements see 6.1.2.1 and 6.1.2.2 of this annex. The term TELECOMMUNICATION NETWORK in 6.1.2 being replaced by the term CABLE DISTRIBUTION SYSTEM.	N
7.3	In **Norway** and **Sweden,** for requirements see 1.2.13.14 and 1.7.2.1 of this annex. (EN 60950-1/A11)	N
7.3	In **Norway**, for installation conditions see EN 60728-11:2005.	N

ZC	A-DEVIATIONS (informative) (EN 60950-1/A11)	N
1.5.1	**Switzerland** (Ordinance on environmentally hazardous substances SR 814.081, Annex 1.7, Mercury - Annex 1.7 of SR 814.81 applies for mercury.) Add the following: NOTE In Switzerland, switches containing mercury such as thermostats, relays and level controllers are not allowed.	N
1.7.2.1	**Germany** (Gesetz über technische Arbeitsmittel und Verbraucherprodukte (Geräte- und Produktsicherheitsgesetz – GPSG) [Law on technical labour equipment and consumer products], of 6th January 2004, Section 2, Article 4, Clause (4), Item 2). If for the assurance of safety and health certain rules during use, amending or maintenance of a technical labour equipment or readymade consumer product are to be followed, a manual in German language has to be delivered when placing the product on the market. Of this requirement, rules for use even only by SERVICE PERSONS are not exempted.	N
1.7.13	**Switzerland** (Ordinance on chemical hazardous risk reduction SR 814.81, Annex 2.15 Batteries) Annex 2.15 of SR 814.81 applies for batteries.	N

1.5.1	TABLE: List of critical components				P
Object/ part No.	Manufacturer/ trademark	Type/model	Technical data	Standard	Mark(s) of conformity[1)]
PCB	SHENZHEN XUNJIEXING TECHNOLOGY CO LTD	JX02	V-0,130℃	UL796	UL E305654
Supplementary information: [1)] Provided evidence ensures the agreed level of compliance.					

1.6.2	TABLE: Electrical data (in normal conditions)					P
U (V)	I (A)	Irated (A)	P (W)	Fuse #	Ifuse (A)	Condition/status
5VDC	1.398	2.0	6.99	--	--	Max. rated loading

2.1.1.5 c) 1)	TABLE: max. V, A, VA test				P
Voltage (rated) (V)	Current (rated) (A)	Voltage (max.) (V)	Current (max.) (A)	VA (max.) (VA)	
USB output	--	4.52	1.63	5.8	
HDMI output	--	3.65	0.27	0.2	
Note(s): Test voltage / frequency:					

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

2.1.1.7	TABLE: discharge test				N
Condition	Calculated (s)	Measured (s)	tu→0V	Comments	
Note(s): Overall capacity: --uF Discharge resistor: --MΩ					

2.2.2	TABLE: Hazardous voltage measurement				N
Transformer	Location	Max. Voltage (V)		Voltage Limitation Component	
		V peak	V d.c.		
Note(s): Test voltage / frequency:					

2.2.3	TABLE: SELV voltage measurement		N
Location	Voltage measured (V)	Comments	
Note(s): Test voltage / frequency:			

2.4.2	TABLE: limited current circuit measurement	N

Location	Voltage (V)	Current (mA)	Frequency (kHz)	Limit (mA)	Comments
Note(s): Test voltage / frequency:					

2.5	TABLE: limited power sources				P
Measured Uoc (V) with all load circuits disconnected: USB output: 4.52V		See below			
		I_{sc} (A)		VA	
		Meas.	Limit	Meas.	Limit
Normal condition		1.63	8	5.8	100
Single fault: R516 s-c		0	8	0	100
Single fault: C327 s-c		0	8	0	100
supplementary information					
Note(s): Test voltage / frequency: I_{sc}: Maximum output current with any non-capacitive load, including a short-circuit.					

2.5	TABLE: limited power sources				P
Measured Uoc (V) with all load circuits disconnected: HDMI output: 3.65V		See below			
		I_{sc} (A)		VA	
		Meas.	Limit	Meas.	Limit
Normal condition		0.27	8	0.2	100
Single fault: D23 s-c		0	8	0	100
Single fault: C497 s-c		0	8	0	100
supplementary information					
Note(s): Test voltage / frequency: I_{sc}: Maximum output current with any non-capacitive load, including a short-circuit.					

2.10.2	Table: working voltage measurement			N
Location		Peak voltage (V)	RMS voltage (V)	Comments

Note(s): Test voltage / frequency: [1)] An asterisk indicates the highest measured working voltage

2.10.3 and 2.10.4	**TABLE: Clearance and creepage distance measurements**	**N**

Clearance (cl) and creepage distance (cr) at/of/between:	U peak (V)	U r.m.s. (V)	Required cl (mm)	cl (mm)	Required cr (mm)	cr (mm)
Supplementary information						
Note(s): --						

2.10.5	**TABLE: Distance through insulation measurements**	**N**

Distance through insulation (DTI)at/of:	U peak (V)	U rms (V)	Test voltage (V)	Required DTI (mm)	DTI (mm)
Supplementary information					
Note(s): --					

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

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

Test results:		Verdict
- Chemical leaks		
- Explosion of the battery		
- Emission of flame or expulsion of molten metal		
- Electric strength tests of equipment after completion of tests	Class III appliance	
Note(s): --		

4.5	**TABLE: maximum temperatures**					**P**
	Test voltage ..... :	5.0VDC				--
		--	--	--	--	
	t_{amb1} (℃) ..... :	24.8				--
	t_{amb2} (℃) ..... :	25.0	Shift to 45.0			--

maximum temperature T of part/at::	T (℃)				allowed T_{max} (℃)
PCB near U11	42.6	62.6			130
PCB near U4	48.7	68.7			130
PCB near U3	44.3	64.3			130
Ambient	25.0℃	Shift to 45.0			--

temperature T of winding:	R_1 (Ω)	R_2 (Ω)	T (℃)	allowed T_{max} (℃)	insulation class
--	--	--	--	--	--
Supplementary information					
Note(s): --					

4.5.5	**TABLE: Ball pressure test of thermoplastic parts**		**N**
	Allowed impression diameter (mm) ..... :	< 2 mm	--

Part	Test temperature (℃)	Impression diameter (mm)
Note(s): --		

4.7	**TABLE: Resistance to fire**				**N**
Part	Manufacturer of material	Type of material	Thickness (mm)	Flammability class	Evidence
Supplementary information					
Note(s): --					

5.1	**TABLE: touch current measurement**	**N**

Measured between:	Measured (mA)	Limit (mA)	Comments
Note(s): Test voltage / frequency:			

5.2	TABLE: Electric strength tests, impulse tests and voltage surge tests	N
Test voltage applied between:	Test voltage (V)	Breakdown
Note(s): --		

5.3	TABLE: Fault condition tests		P
	Ambient temperature (℃) ..... :	See below	--
	Power source for EUT: manufacturer, model/type, output rating ..... :	--	--

Component No.	Fault	Test voltage (V)	Test time	Fuse #	Fuse current (A)	Result
C1	s-c	5Vdc	10mins	--	--	Unit shut down, No hazard, no damage,unrevoverable.
D46	s-c	5Vdc	10mins	--	--	Unit shut down, No hazard, no damage, revoverable.
Supplementary information						
Note(s): In fault column, s-c = short-circuit, o-c = open-circuit, o-l = overload						

Annex 1:Photo
Photo documentation

Photo 1 PCB view

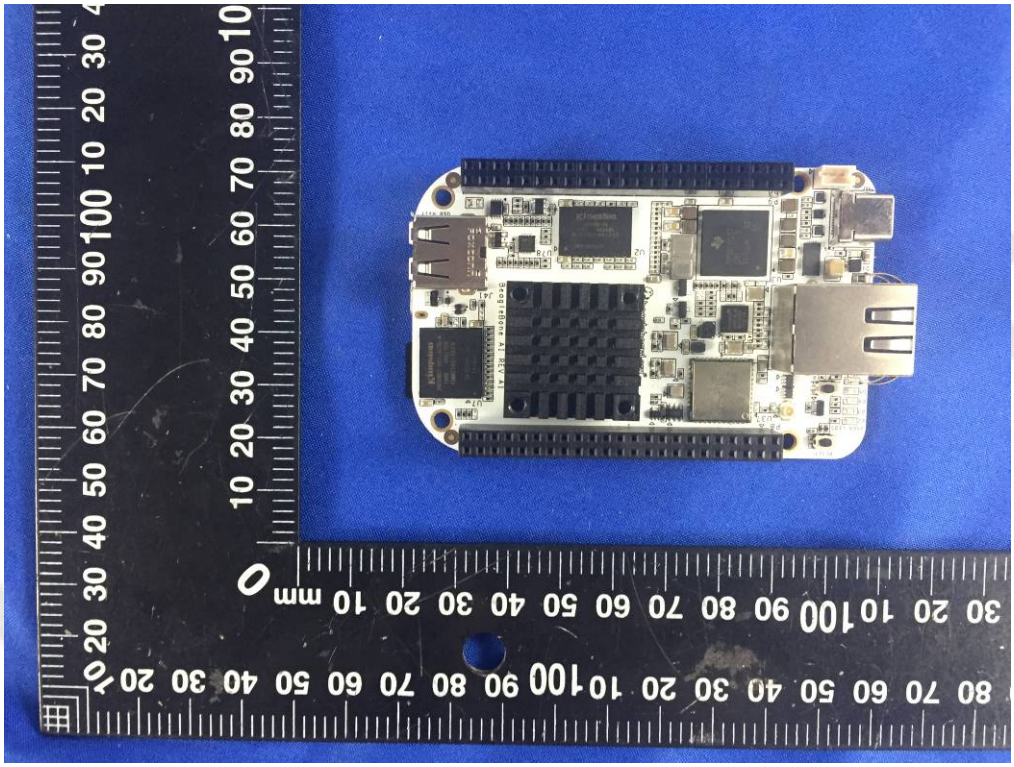
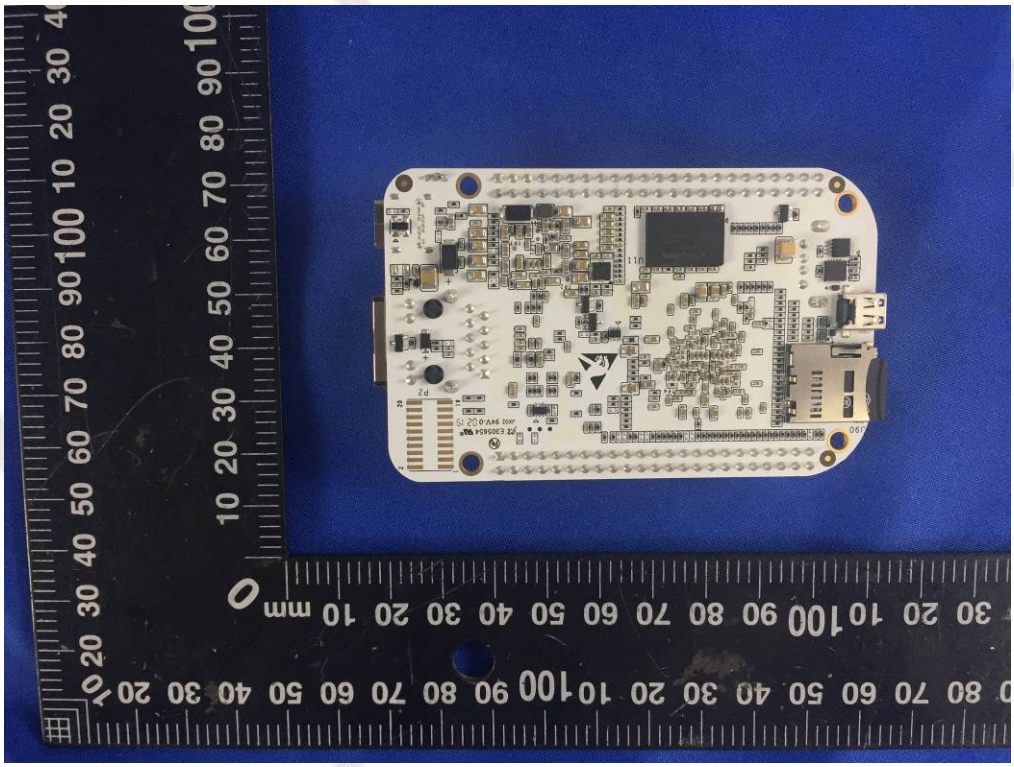


Photo 2 PCB view



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