



SAFETY TEST REPORT

MEASUREMENT AND TEST REPORT For

Dongguan Yuan Ze Acoustics Technology.,Ltd
2nd Floor, Building A, 26 Hantang Street, Qiantou Community Dongcheng Street,
Dongguan City, Guangdong Province

Models: Carol (TWS18)

Aug. 20, 2024

This Report Concerns : ☒ Original Report	Equipment Type : Bluetooth Headset
Test Standard:	EN 62368-1:2020+A11:2020
Report Number:	HRC20240820035S
Test Date:	Aug. 14,2024 - 20 .Aug, 2024
Test category:	Consignment test
Prepared By:	Shenzhen HRC Testing Technology Co., Ltd. 1508, Block A, Goldman Sachs Building, Shajing Street Center Road, Baoan District, Shenzhen City, Guangdong Province. E-mail: hrc@hrc-cans.com Web: http://www.hrc-lab.com

Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior written consent of Shenzhen HRC Technology Co., Ltd

TEST REPORT EN 62368-1 Audio/video, information and communication technology equipment — Part 1: Safety requirements
Report reference No..... : HRC20240820035S Date of issue..... : Aug. 20, 2024
Testing laboratory Name..... : Shenzhen HRC Testing Technology Co., Ltd. Address..... : 1508, Block A, Goldman Sachs Building, Shajing Street Center Road, Baoan District, Shenzhen City, Guangdong Province. Test location..... : (Same as above)
Client Name..... : Dongguan Yuan Ze Acoustics Technology.,Ltd Address..... : 2nd Floor, Building A, 26 Hantang Street, Qiantou Community Dongcheng Street, Dongguan City, Guangdong Province
Test specification Standard..... : EN 62368-1:2020+A11:2020 Test procedure..... : Safty report Procedure deviation..... : N. Non-standard test method.. : N.
Test Report Form No : IEC62368_1B TRF originator : UL(US) Master TRF : 2022-03
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Test item Description..... : Bluetooth Headset Model No. : Carol (TWS18) , AE01, XZ10 , Xtra , Sora , AE01 PRO , AZ10 PRO Brand name..... : KZ Manufacturer..... : Dongguan Yuan Ze Acoustics Technology.,Ltd Address..... : 2nd Floor, Building A, 26 Hantang Street, Qiantou Community Dongcheng Street, Dongguan City, Guangdong Province Rating(s)..... : 3.7V (Built-in polymer battery)

Test item particulars:

Classification of use by.....: ☒ Ordinary person
☐ Instructed person
☐ Skilled person
☐ Children likely to be present

Supply Connection.....: ☐ AC Mains ☐ DC Mains
☒ External Circuit - not Mains connected
- ☒ ES1 ☐ ES2 ☐ ES3

Supply % Tolerance: ☐ +10%/-10%
☐ +20%/-15%
☐ +___%/ -
___% ☒ None

Supply Connection –Type: ☐ pluggable equipment type A -
☐ non-detachable supply cord
☐ appliance coupler
☐ direct plug-in
☐ mating connector
☐ pluggable equipment type B -
☐ non-detachable supply cord
☐ appliance coupler
☐ permanent connection
☐ mating connector ☒ other: _____

Considered current rating of protective device as
part of building or equipment installation.....: _____ / _____ A;

Equipment mobility.....: Installation location: ☐ building; ☐ equipment
☒ movable ☐ hand-held ☐ transportable
☐ stationary ☐ for building-in ☐ direct plug-
☐ rack-mounting ☐ wall-mounted

Over voltage category (OVC): ☐ OVC I ☒ OVC II ☐ OVC III
☐ OVC IV ☐ other: _____

Class of equipment: ☐ Class I ☐ Class II ☒ Class III

Access location: ☐ restricted access location ☒ N

Pollution degree (PD): ☐ PD 1 ☒ PD 2 ☐ PD 3

Manufacturer's specified maximum operating ambient: 25 °C

IP protection class: ☒ IPX0 ☐ IP___

Power Systems: ☒ TN ☐ TT ☐ IT - _____ V L-L

Altitude during operation (m): ☒ 2000 m or less ☐ _____ m

Altitude of test laboratory (m): ☒ 2000 m or less ☐ _____ m

Mass of equipment (kg): ☒ 0.10 kg

Possible test case verdicts:

- test case does not apply to the test object..... : N (Not applicable)
- test object does meet the requirement..... : P(Pass)
- test object does not meet therequirement..... : F(Fail)

Testing:

Date of receipt of test items..... : Aug. 14, 2024

Date(s) of performance of tests..... : Aug. 14 ,2024 - Aug. 20, 2024

Laboratory sample number..... : 240820026-06X

Sample appearance and function are in normal condition, yes or no..... : Yes

Ambient temperature..... : 24-26°C

Ambient humidity..... : 60-65%

General remarks:

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

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Laboratory HRC. The authenticity of this Test Report and its contents can be verified by contacting HRC, responsible for this Test Report.

"(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.

General product information:

- The appliance is intended for indoor or similar condition used only.
- Max. operated temperature is considered as 25°C.
- Instructions and equipment marking related to safety is applied in the language that is acceptable in the country in which the equipment is to be sold.
- Series models list below are identical for construction, working principle and main components listed in below table 4.1.2 The only difference is model name and outlook appearance for decoration. All tests were performed on model Carol (TWS18) .
- **Series models as below :**

AE01, XZ10 , Xtra , Sora , AE01 PRO , AZ10 PRO

Copy of marking plate: For model Carol (TWS18)

Bluetooth Headset

Model No.:Carol (TWS18)

Rating:3.7V (Built-in polymer battery)



Dongguan Yuan Ze Acoustics Technology.,Ltd.

MADE IN CHINA

Summary of testing:

The submitted sample were tested and found to compliance with requirements of the standards
EN 62368-1:2020

Testing procedure and testing location

Laboratory name..... : Shenzhen HRC Testing Technology Co., Ltd.

Testing locationAddress: : 1508, Block A, Goldman Sachs Building, Shajing Street Center Road,
Baoan District, Shenzhen City, Guangdong Province.

Testing procedure : TL ☒ RMT ☐ SMT ☐ WMT ☐ TMP ☐

: Cao Yifan

Tested By
(Test Engineer)

Cao Yifan

: Vincent Li

Reviewed By
(Supervisor)

Vincent Li

Approved By (Chief
Engineer)

: Andy Sun



ENERGY SOURCE IDENTIFICATION AND CLASSIFICATION TABLE:	
(Note 1: Identify the following six (6) energy source forms based on the origin of the energy.)	
(Note 2: The identified classification e.g., ES2, TS1, should be with respect to its ability to cause pain or injury on the body or its ability to ignite a combustible material. Any energy source can be declared Class 3 as a worse case classification e.g. PS3, ES3.)	
Electrically-caused injury (Clause 5):	
(Note: Identify type of source, list sub-assembly or circuit designation and corresponding energy source classification)	
Example: +5 V dc input	ES1
Source of electrical energy	Corresponding classification (ES)
+12 V dc input	ES1
Electrically-caused fire (Clause 6):	
(Note: List sub-assembly or circuit designation and corresponding energy source classification)	
Example: Battery pack (maximum 85 watts):	PS2
Source of power or PIS	Corresponding classification (PS)
Supplied by external power supply which is complied with LPS.	PS2
Injury caused by hazardous substances (Clause 7)	
(Note: Specify hazardous chemicals, whether produces ozone or other chemical construction not addressed as part of the component evaluation.)	
Example: Liquid in filled component	Glycol
Source of hazardous substances	Corresponding chemical
N	N
Mechanically-caused injury (Clause 8)	
(Note: List moving part(s), fan, special installations, etc. & corresponding MS classification based on Table 35.)	
Example: Wall mount unit	MS2
Source of kinetic/mechanical energy	Corresponding classification (MS)
Equipment mass	MS1
Thermal burn injury (Clause 9)	
(Note: Identify the surface or support, and corresponding energy source classification based on type of part, location, operating temperature and contact time in Table 38.)	
Example: Hand-held scanner – thermoplastic enclosure	TS1
Source of thermal energy	Corresponding classification (TS)
Thermocouple - All accessible parts	TS1
Radiation (Clause 10)	
(Note: List the types of radiation present in the product and the corresponding energy source classification.)	
Example:N	N
Type of radiation	Corresponding classification (RS)
N	N

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

OVERVIEW OF EMPLOYED SAFEGUARDS				
Clause	Possible Hazard			
5.1	Electrically-caused injury			
Body Part (e.g. Ordinary)	Energy Source (ES3: Primary Filter circuit)	Safeguards		
		Basic	Supplementary	Reinforced (Enclosure)
Ordinary	ES1: +12Vdc input	N	N	N
6.1	Electrically-caused fire			
Material part (e.g. mouse enclosure)	Energy Source (PS1: 15 Watt circuit)	Safeguards		
		Basic	Supplementary	Reinforced
Enclosure	PS1	See 6.3	V-1 or better	N
PCB	PS1	See 6.3	V-0	N
Internal/external wiring	PS1	N	N	See 6.5
Other combustible components / materials	PS1	See 6.3	See 6.4.5, 6.4.6	N
7.1	Injury caused by hazardous substances			
Body Part (e.g., skilled)	Energy Source (hazardous material)	Safeguards		
		Basic	Supplementary	Reinforced
N	N	N	N	N
8.1	Mechanically-caused injury			
Body Part (e.g. Ordinary)	Energy Source (MS3: High Pressure Lamp)	Safeguards		
		Basic	Supplementary	Reinforced (Enclosure)
Ordinary	MS1: Equipment Mass	N	N	N
9.1	Thermal Burn			
Body Part (e.g., Ordinary)	Energy Source (TS2)	Safeguards		
		Basic	Supplementary	Reinforced
Ordinary	TS1: All accessible parts	N	N	N
10.1	Radiation			
Body Part (e.g., Ordinary)	Energy Source (Output from audio port)	Safeguards		
		Basic	Supplementary	Reinforced
Ordinary	RS1: LED backlight	N	N	N
Supplementary Information:				
(1) See attached energy source diagram for additional details.				
(2) "N" – Normal Condition; "A" – Abnormal Condition; "S" Single Fault.				

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Clause	Requirement + Test	Result - Remark	Verdict
4	GENERAL REQUIREMENTS		P
4.1.1	Acceptance of materials, components and subassemblies		P
4.1.2	Use of components		P
4.1.3	Equipment design and construction		P
4.1.15	Markings and instructions..... :	(See Annex F)	P
4.4.4	Safeguard robustness		P
4.4.4.2	Steady force tests..... :	(See Annex T.4, T.5)	N
4.4.4.3	Drop tests..... :	(See Annex T.7)	P
4.4.4.4	Impact tests..... :	(See Annex T.6)	N
4.4.4.5	Internal accessible safeguard enclosure and barrier tests..... :	(See Annex T.3)	N
4.4.4.6	Glass Impact tests..... :	(See Annex T.9, Annex U)	N
4.4.4.7.4	Thermoplastic material tests..... :	(See Annex T.8)	N
4.4.4.8	Air comprising a safeguard..... :	(See Annex T)	N
4.4.4.9	Accessibility and safeguard effectiveness		P
4.5	Explosion		N
4.6	Fixing of conductors		P
4.6.1	Fix conductors not to defeat a safeguard		P
4.6.2	10 N force test applied to :		P
4.7	Equipment for direct insertion into mains socket - outlets		N
4.7.2	Mains plug part complies with the relevant standard..... :	No connected to mains	N
4.7.3	Torque (Nm)..... :	Not direct plug-in appliance	N
4.8	Products containing coin/button cell batteries	No such cell/battery used	N
4.8.2	Instructional safeguard		N
4.8.3	Battery Compartment Construction		N
	Means to reduce the possibility of children removing the battery..... :		—
4.8.4	Battery Compartment Mechanical Tests..... :	(See Table 4.8.4)	N
4.8.5	Battery Accessibility		N
4.9	Likelihood of fire or shock due to entry of conductive object..... :	(See Annex P)	N
5	ELECTRICALLY-CAUSED INJURY		P
5.2.1	Electrical energy source classifications..... :	(See appended table 5.2)	P
5.2.2	ES1, ES2 and ES3 limits		P
5.2.2.2	Steady-state voltage and current..... :	See appended table 5.2)	N
5.2.2.3	Capacitance limits..... :	(See appended table 5.2)	N

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Clause	Requirement + Test	Result - Remark	Verdict
5.2.2.4	Single pulse limits.....:	(See appended table 5.2)	N
5.2.2.5	Limits for repetitive pulses.....:	(See appended table 5.2)	N
5.2.2.6	Ringing signals	(See Annex H)	N
5.2.2.7	Audio signals	(See Clause E.1)	N
5.3	Protection against electrical energy sources		P
5.3.1	General Requirements for accessible parts to ordinary, instructed and skilled persons		N
5.3.2.1	Accessibility to electrical energy sources and safeguards	ES1	N
5.3.2.2	Contact requirements		N
	a) Test with test probe from Annex V.....:	ES1	N
	b) Electric strength test potential (V).....:	ES1	N
	c) Air gap (mm)	ES1	N
5.3.2.4	Terminals for connecting stripped wire		N
5.4	Insulation materials and requirements		P
5.4.1.2	Properties of insulating material		P
5.4.1.3	Humidity conditioning.....:	(See sub-clause 5.4.8)	N
5.4.1.4	Maximum operating temperature for insulating materials	(See appended table 5.4.1.4)	P
5.4.1.5	Pollution degree.....:	2	—
5.4.1.5.2	Test for pollution degree 1 environment and for an insulating compound		N
5.4.1.5.3	Thermal cycling		N
5.4.1.6	Insulation in transformers with varying dimensions		N
5.4.1.7	Insulation in circuits generating starting pulses		N
5.4.1.8	Determination of working voltage		N
5.4.1.9	Insulating surfaces		N
5.4.1.10	Thermoplastic parts on which conductive metallic parts are directly mounted		N
5.4.1.10.2	Vicat softening temperature.....:	(See appended table 5.4.1.10.2)	N
5.4.1.10.3	Ball pressure	Conductive metal part on PCB was not directly mount on Bottom enclosure	N
5.4.2	Clearances	All internal voltage does not exceed ES1 limits, no insulation material necessary for providing safeguard function.	N
5.4.2.2	Determining clearance using peak working voltage	(See appended table 5.4.2.2)	N
5.4.2.3	Determining clearance using required withstand voltage	(See appended table 5.4.2.3)	N

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Clause	Requirement + Test	Result - Remark	Verdict
	a) a.c. mains transient voltage..... :		—
	b) d.c. mains transient voltage:		—
	c) external circuit transient voltage.....:		—
	d) transient voltage determined by measurement..		—
5.4.2.4	Determining the adequacy of a clearance using an electric strength test	(See appended table 5.4.2.4)	N
5.4.2.5	Multiplication factors for clearances and test voltages..... :		N
5.4.3	Creepage distances..... :	All internal voltage does not exceed ES1 limits, no insulation material necessary for providing safeguard function.	N
5.4.3.1	General		N
5.4.3.3	Material Group :	IIIa/b	—
5.4.4	Solid insulation		N
5.4.4.2	Minimum distance through insulation :	(See appended table 5.4.4.2)	N
5.4.4.3	Insulation compound forming solid insulation		N
5.4.4.4	Solid insulation in semiconductor devices		N
5.4.4.5	Cemented joints		N
5.4.4.6	Thin sheet material		N
5.4.4.6.1	General requirements		N
5.4.4.6.2	Separable thin sheet material		N
	Number of layers (pcs) :		N
5.4.4.6.3	Non-separable thin sheet material		N
5.4.4.6.4	Standard test procedure for non-separable thin sheet material..... :	(See appended Table 5.4.9)	N
5.4.4.6.5	Mandrel test		N
5.4.4.7	Solid insulation in wound components		N
5.4.4.9	Solid insulation at frequencies >30 kHz..... :	(See appended Table 5.4.4.9)	N
5.4.5	Antenna terminal insulation		N
5.4.5.1	General		N
5.4.5.2	Voltage surge test		N
	Insulation resistance (MΩ)..... :		—
5.4.6	Insulation of internal wire as part of supplementary safeguard..... :	(See appended table 5.4.4.2)	N
5.4.7	Tests for semiconductor components and for cemented joints		N
5.4.8	Humidity conditioning		N
	Relative humidity (%)..... :		—
	Temperature (°C) :		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Duration (h)		—
5.4.9	Electric strength test.....	(See appended table 5.4.9)	N
5.4.9.1	Test procedure for a solid insulation type test		N
5.4.9.2	Test procedure for routine tests		N
5.4.10	Protection against transient voltages between external circuit		N
5.4.10.1	Parts and circuits separated from external circuits	(See appended table 5.4.9)	N
5.4.10.2	Test methods		N
5.4.10.2.1	General		N
5.4.10.2.2	Impulse test.....	(See appended table 5.4.9)	N
5.4.10.2.3	Steady-state test.....	(See appended table 5.4.9)	N
5.4.11	Insulation between external circuits and earthed circuitry.....	(See appended table 5.4.9)	N
5.4.11.1	Exceptions to separation between external circuits and earth		N
5.4.11.2	Requirements		N
	Rated operating voltage U_{op} (V).....		—
	Nominal voltage U_{peak} (V).....		—
	Max increase due to variation U_{sp}		—
	Max increase due to ageing ΔU_{sa}		—
	$U_{op} = U_{peak} + \Delta U_{sp} + \Delta U_{sa}$		—
5.5	Components as safeguards		
5.5.1	General		N
5.5.2	Capacitors and RC units		N
5.5.2.1	General requirement		N
5.5.2.2	Safeguards against capacitor discharge after disconnection of a connector.....	(See appended table 5.5.2.2)	N
5.5.3	Transformers	(See Annex G.5.3)	N
5.5.4	Optocouplers	(See sub-clause 5.4 or Annex G.12)	N
5.5.5	Relays	(See Annex G.2)	N
5.5.6	Resistors	(See Annex G.10)	N
5.5.7	SPD's	(See Annex G.8)	N
5.5.7.1	Use of an SPD connected to reliable earthing		N
5.5.7.2	Use of an SPD between mains and protective earth		N
5.5.8	Insulation between the mains and external circuit consisting of a coaxial cable.....	(See Annex G.10.3)	N
5.6	Protective conductor		N

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Clause	Requirement + Test	Result - Remark	Verdict
5.6.2	Requirement for protective conductors		N
5.6.2.1	General requirements		N
5.6.2.2	Colour of insulation		N
5.6.3	Requirement for protective earthing conductors		N
	Protective earthing conductor size (mm ²)		—
5.6.4	Requirement for protective bonding conductors		N
5.6.4.1	Protective bonding conductors		N
	Protective bonding conductor size (mm ²).....		—
	Protective current rating (A)		—
5.6.4.3	Current limiting and overcurrent protective devices		N
5.6.5	Terminals for protective conductors		N
5.6.5.1	Requirement		N
	Conductor size (mm ²), nominal thread diameter (mm).....		N
5.6.5.2	Corrosion		N
5.6.6	Resistance of the protective system		N
5.6.6.1	Requirements		N
5.6.6.2	Test Method Resistance (Ω).....	(See appended table 5.6.6.2)	N
5.6.7	Reliable earthing		N
5.7	Prospective touch voltage, touch current and protective conductor current		N
5.7.2	Measuring devices and networks		N
5.7.2.1	Measurement of touch current.....	(See appended table 5.7.4)	N
5.7.2.2	Measurement of prospective touch voltage		N
5.7.3	Equipment set-up, supply connections and earth connections		N
	System of interconnected equipment (separate connections/single connection).....		—
	Multiple connections to mains (one connection at a time/simultaneous connections).....		—
5.7.4	Earthed conductive accessible parts.....	(See appended Table 5.7.4)	N
5.7.5	Protective conductor current		N
	Supply Voltage (V).....		—
	Measured current (mA).....		—
	Instructional Safeguard.....	(See F.4 and F.5)	N
5.7.6	Prospective touch voltage and touch current due to external circuits		N
5.7.6.1	Touch current from coaxial cables		N

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Clause	Requirement + Test	Result - Remark	Verdict
5.7.6.2	Prospective touch voltage and touch current from external circuits		N
5.7.7	Summation of touch currents from external circuits		N
	a) Equipment with earthed external circuits Measured current (mA).....		N
	b) Equipment whose external circuits are not referenced to earth. Measured current (mA).....		N
6	ELECTRICALLY- CAUSED FIRE		P
6.2	Classification of power sources (PS) and potential ignition sources (PIS)		P
6.2.2	Power source circuit classifications	PS (power source) classification determined by measuring the maximum power in Figures 34 and 35 for load and power source circuits. Power source classified as PS1	P
6.2.2.1	General		P
6.2.2.2	Power measurement for worst-case load fault... :	(See appended table 6.2.2)	P
6.2.2.3	Power measurement for worst-case power source fault.....:	(See appended table 6.2.2)	P
6.2.2.4	PS1	(See appended table 6.2.2)	N
6.2.2.5	PS2	(See appended table 6.2.2)	N
6.2.2.6	PS3	(See appended table 6.2.2)	N
6.2.3	Classification of potential ignition sources	PS1	P
6.2.3.1	Arcing PIS	(See appended table 6.2.3.1)	N
6.2.3.2	Resistive PIS	(See appended table 6.2.3.2)	N
6.3	Safeguards against fire under normal operating and abnormal operating conditions		P
6.3.1 (a)	No ignition and attainable temperature value less than 90 % defined by ISO 871 or less than 300 °C for unknown materials.....:	(See appended table 5.4.1.5, 6.3.2, 9.0, B.2.6)	P
6.3.1 (b)	Combustible materials outside fire enclosure		N
6.4	Safeguards against fire under single fault conditions		P
6.4.1	Safeguard Method		P
6.4.2	Reduction of the likelihood of ignition under single fault conditions in PS1 circuits		N
6.4.3	Reduction of the likelihood of ignition under single fault conditions in PS2 and PS3 circuits	(see appended table B.3 & B.4)	P
6.4.3.1	General		P
6.4.3.2	Supplementary Safeguards		P
	Special conditions if conductors on printed boards are opened or peeled		N

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Clause	Requirement + Test	Result - Remark	Verdict
6.4.3.3	Single Fault Conditions :	(see appended table B.3 & B.4)	P
	Special conditions for temperature limited by fuse		N
6.4.4	Control of fire spread in PS1 circuits		N
6.4.5	Control of fire spread in PS2 circuits	Non-combustible material Glass act as part of fire enclosure	P
6.4.5.2	Supplementary safeguards :	(See appended tables 4.1.2); also no ignition found during single fault condition.	P
6.4.6	Control of fire spread in PS3 circuit		N
6.4.7	Separation of combustible materials from a PIS		N
6.4.7.1	General..... :	(See tables 6.2.3.1 and 6.2.3.2)	N
6.4.7.2	Separation by distance		N
6.4.7.3	Separation by a fire barrier		N
6.4.8	Fire enclosures and fire barriers		N
6.4.8.1	Fire enclosure and fire barrier material properties		N
6.4.8.2.1	Requirements for a fire barrier		N
6.4.8.2.2	Requirements for a fire enclosure		N
6.4.8.3	Constructional requirements for a fire enclosure and a fire barrier		N
6.4.8.3.1	Fire enclosure and fire barrier openings		N
6.4.8.3.2	Fire barrier dimensions		N
6.4.8.3.3	Top Openings in Fire Enclosure: dimensions (mm).....		N
	Needle Flame test		N
6.4.8.3.4	Bottom Openings in Fire Enclosure, condition met a), b) and/or c) dimensions (mm).....		N
	Flammability tests for the bottom of a fire enclosure		N
6.4.8.3.5	Integrity of the fire enclosure, condition met: a), b) or c)..... :		N
6.4.8.4	Separation of PIS from fire enclosure and fire barrier distance (mm) or flammability rating.....		N
6.5	Internal and external wiring		P
6.5.1	Requirements		P
6.5.2	Cross-sectional area (mm ²)		—
6.5.3	Requirements for interconnection to building wiring.....	(See Annex Q.)	N

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Clause	Requirement + Test	Result - Remark	Verdict
6.6	Safeguards against fire due to connection to additional equipment		N
	External port limited to PS2 or complies with Clause Q.1		N

7	INJURY CAUSED BY HAZARDOUS SUBSTANCES		P
7.2	Reduction of exposure to hazardous substances	For rechargeable battery: suitable tests and evaluation was done acc.	P
7.3	Ozone exposure		N
7.4	Use of personal safeguards (PPE)		N
	Personal safeguards and instructions.....:		—
7.5	Use of instructional safeguards and instructions		N
	Instructional safeguard (ISO 7010).....:		—
7.6	Batteries.....:	(See Annex M)	P

8	MECHANICALLY-CAUSED INJURY		P
8.1	General		P
8.2	Mechanical energy source classifications	Sharp edges and corners: MS1 Equipment mass: MS1	P
8.3	Safeguards against mechanical energy sources		N
8.4	Safeguards against parts with sharp edges and corners	Checked, enclosure without Sharp edges and corners	N
8.4.1	Safeguards		N
8.5	Safeguards against moving parts		N
8.5.1	MS2 or MS3 part required to be accessible for the function of the equipment		N
8.5.2	Instructional Safeguard:		—
8.5.4	Special categories of equipment comprising moving parts		N
8.5.4.1	Large data storage equipment		N
8.5.4.2	Equipment having electromechanical device for destruction of media		N
8.5.4.2.1	Safeguards and Safety Interlocks.....:	(See Annex F.4 and Annex K)	N
8.5.4.2.2	Instructional safeguards against moving parts		N
	Instructional Safeguard.....:		—

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Clause	Requirement + Test	Result - Remark	Verdict
8.5.4.2.3	Disconnection from the supply		N
8.5.4.2.4	Probe type and force (N).....:		N
8.5.5	High Pressure Lamps		N
8.5.5.1	Energy Source Classification		N
8.5.5.2	High Pressure Lamp Explosion Test.....: (See appended table 8.5.5.2)		N
8.6	Stability	Equipment mass < 7 kg, classified as MS1.	N
8.6.1	Product classification		N
	Instructional Safeguard..... :		—
8.6.2	Static stability		N
8.6.2.2	Static stability test		N
	Applied Force.....		—
8.6.2.3	Downward Force Test		N
8.6.3	Relocation stability test		N
	Unit configuration during 10° tilt.....		—
8.6.4	Glass slide test		N
8.6.5	Horizontal force test (Applied Force).....		N
	Position of feet or movable parts.....		—
8.7	Equipment mounted to wall or ceiling	Not mounting equipment.	N
8.7.1	Mounting Means (Length of screws (mm) and mounting surface).....		N
8.7.2	Direction and applied force.....		N
8.8	Handles strength	No such handles.	N
8.8.1	Classification		N
8.8.2	Applied Force.....		N
8.9	Wheels or casters attachment requirements	No such wheels or casters within the EUT	N
8.9.1	Classification		N
8.9.2	Applied force.....		—
8.10	Carts, stands and similar carriers	No such device provided within the EUT.	N
8.10.1	General		N
8.10.2	Marking and instructions		N
	Instructional Safeguard.....		—
8.10.3	Cart, stand or carrier loading test and compliance		N
	Applied force.....		—
8.10.4	Cart, stand or carrier impact test		N

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Clause	Requirement + Test	Result - Remark	Verdict
8.10.5	Mechanical stability		N
	Applied horizontal force (N).....		—
8.10.6	Thermoplastic temperature stability (°C).....		N
8.11	Mounting means for rack mounted equipment	The equipment is not intended to be rack-mounted.	N
8.11.1	General		N
8.11.2	Product Classification		N
8.11.3	Mechanical strength test, variable <i>N</i>		N
8.11.4	Mechanical strength test 244N, including end stops		N
8.12	Telescoping or rod antennas.....	(See Annex T); No such device provided within the EUT.	N
	Button/Ball diameter (mm).....		—

9	THERMAL BURN INJURY		P
9.2	Thermal energy source classifications	All accessible surfaces are classified as TS1 under normal and abnormal operating conditions.	P
9.3	Safeguard against thermal energy sources		N
9.4	Requirements for safeguards		N
9.4.1	Equipment safeguard		N
9.4.2	Instructional safeguard.....		N

10	RADIATION		P
10.2	Radiation energy source classification	INFRARED CAMERA lamp (LEDs) for cosmetic use (low power application) which were considered to comply exempt group of IEC 62471.	P
10.2.1	General classification		N
10.3	Protection against laser radiation		N
	Laser radiation that exists equipment:		—
	Normal, abnormal, single-fault.....	(See attached laser test report)	N
	Instructional safeguard.....		—
	Tool.....		—
10.4	Protection against visible, infrared, and UV radiation		N
10.4.1	General		N
10.4.1.a)	RS3 for Ordinary and instructed persons.....		N
10.4.1.b)	RS3 accessible to a skilled person.....		N

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Clause	Requirement + Test	Result - Remark	Verdict
	Personal safeguard (PPE) instructional safeguard.....		—
10.4.1.c)	Equipment visible, IR, UV does not exceed RS1.....		N
10.4.1.d)	Normal, abnormal, single-fault conditions	(See appended table B.3 & B.4)	N
10.4.1.e)	Enclosure material employed as safeguard is opaque.....		N
10.4.1.f)	UV attenuation.....		N
10.4.1.g)	Materials resistant to degradation UV.....		N
10.4.1.h)	Enclosure containment of optical radiation.....		N
10.4.1.i)	Exempt Group under normal operating conditions.....		N
10.4.2	Instructional safeguard.....		N
10.5	Protection against x-radiation		N
10.5.1	X- radiation energy source that exists equipment :	(See appended table B.3 & B.4)	N
	Normal, abnormal, single fault conditions		N
	Equipment safeguards.....		N
	Instructional safeguard for skilled person.....		N
10.5.3	Most unfavourable supply voltage to give maximum radiation.....		—
	Abnormal and single-fault condition.....	(See appended table B.3 & B.4)	N
	Maximum radiation (pA/kg).....		N
10.6	Protection against acoustic energy sources		N
10.6.1	General		N
10.6.2	Classification		N
	Acoustic output, dB(A).....		N
	Output voltage, unweighted r.m.s.....		N
10.6.4	Protection of persons		N
	Instructional safeguards.....		N
	Equipment safeguard prevent ordinary person to RS2.....		—
	Means to actively inform user of increase sound pressure.....		—
	Equipment safeguard prevent ordinary person to RS2.....		—
10.6.5	Requirements for listening devices (headphones, earphones, etc.)		N
10.6.5.1	Corded passive listening devices with analog input		N

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Clause	Requirement + Test	Result - Remark	Verdict
	Input voltage with 94 dB(A) L_{Aeq} acoustic pressure output.....		—
10.6.5.2	Corded listening devices with digital input		N
	Maximum dB(A).....		—
10.6.5.3	Cordless listening device		N
	Maximum dB(A).....		—
B	NORMAL OPERATING CONDITION TESTS, ABNORMAL OPERATING CONDITION TESTS AND SINGLE FAULT CONDITION TESTS		P
B.2	Normal Operating Conditions	(See appended table B.2.5)	P
B.2.1	General requirements.....	(See Test Item Particulars and appended test tables)	P
	Audio Amplifiers and equipment with audio amplifiers.....	(See Annex E)	N
B.2.3	Supply voltage and tolerances		P
B.2.5	Input test.....	(See appended table B.2.5)	P
B.3	Simulated abnormal operating conditions		P
B.3.1	General requirements.....	(See appended table B.3)	P
B.3.2	Covering of ventilation openings		N
B.3.3	D.C. mains polarity test		N
B.3.4	Setting of voltage selector.....		N
B.3.5	Maximum load at output terminals.....		P
B.3.6	Reverse battery polarity		N
B.3.7	Abnormal operating conditions as specified in Clause E.2.		N
B.3.8	Safeguards functional during and after abnormal operating conditions		P
B.4	Simulated single fault conditions		P
B.4.2	Temperature controlling device open or short-circuited.....	(See appended table B.4)	P
B.4.3	Motor tests		N
B.4.3.1	Motor blocked or rotor locked increasing the internal ambient temperature	(See Clause G.5)	N
B.4.4	Short circuit of functional insulation		N
B.4.4.1	Short circuit of clearances for functional insulation		N
B.4.4.2	Short circuit of creepage distances for functional insulation		N
B.4.4.3	Short circuit of functional insulation on coated printed boards		N
B.4.5	Short circuit and interruption of electrodes in tubes and semiconductors		N

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Clause	Requirement + Test	Result - Remark	Verdict
B.4.6	Short circuit or disconnect of passive components		N
B.4.7	Continuous operation of components		N
B.4.8	Class 1 and Class 2 energy sources within limits during and after single fault conditions		P
B.4.9	Battery charging under single fault conditions.....: (See Annex M)		N
C	UV RADIATION		N
C.1	Protection of materials in equipment from UV radiation		N
C.1.2	Requirements		N
C.1.3	Test method		N
C.2	UV light conditioning test		N
C.2.1	Test apparatus		N
C.2.2	Mounting of test samples		N
C.2.3	Carbon-arc light-exposure apparatus		N
C.2.4	Xenon-arc light exposure apparatus		N
D	TEST GENERATORS		N
D.1	Impulse test generators		N
D.2	Antenna interface test generator		N
D.3	Electronic pulse generator		N
E	TEST CONDITIONS FOR EQUIPMENT CONTAINING AUDIO AMPLIFIERS		N
E.1	Audio amplifier normal operating conditions		N
	Audio signal voltage (V).....		—
	Rated load impedance (Ω)		
E.2	Audio amplifier abnormal operating conditions		N
F	EQUIPMENT MARKINGS, INSTRUCTIONS, AND INSTRUCTIONAL SAFEGUARDS		P
F.1	General requirements		P
	Instructions – Language	English instruction manual	—
F.2	Letter symbols and graphical symbols		P
F.2.1	Letter symbols according to IEC60027-1		N
F.2.2	Graphic symbols IEC, ISO or manufacturer specific		P
F.3	Equipment markings		P
F.3.1	Equipment marking locations		P
F.3.2	Equipment identification markings		P
F.3.2.1	Manufacturer identification	See marking label	—
F.3.2.2	Model identification	See marking label	—
F.3.3	Equipment rating markings	Se marking label	P

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Clause	Requirement + Test	Result - Remark	Verdict
F.3.3.1	Equipment with direct connection to mains		N
F.3.3.2	Equipment without direct connection to mains		P
F.3.3.3	Nature of supply voltage.....	See making label	—
F.3.3.4	Rated voltage.....	See making label	—
F.3.3.4	Rated frequency.....	Not connected to mains	—
F.3.3.6	Rated current or rated power.....	See marking label	—
F.3.3.7	Equipment with multiple supply connections		N
F.3.4	Voltage setting device		N
F.3.5	Terminals and operating devices		N
F.3.5.1	Mains appliance outlet and socket-outlet markings.....		N
F.3.5.2	Switch position identification marking.....		N
F.3.5.3	Replacement fuse identification and rating markings.....		N
F.3.5.4	Replacement battery identification marking.....		N
F.3.5.5	Terminal marking location		N
F.3.6	Equipment markings related to equipment classification		P
F.3.6.1	Class I Equipment		N
F.3.6.1.1	Protective earthing conductor terminal		N
F.3.6.1.2	Neutral conductor terminal		N
F.3.6.1.3	Protective bonding conductor terminals		N
F.3.6.2	Class II equipment (IEC60417-5172)		N
F.3.6.2.1	Class II equipment with or without functional earth		N
F.3.6.2.2	Class II equipment with functional earth terminal marking		N
F.3.7	Equipment IP rating marking		—
F.3.8	External power supply output marking		N
F.3.9	Durability, legibility and permanence of marking	Rubbing test	P
F.3.10	Test for permanence of markings		N
F.4	Instructions		P
	a) Equipment for use in locations where children not likely to be present - marking		N
	b) Instructions given for installation or initial use		N
	c) Equipment intended to be fastened in place		N
	d) Equipment intended for use only in restricted access area		N

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Clause	Requirement + Test	Result - Remark	Verdict
	e) Audio equipment terminals classified as ES3 and other equipment with terminals marked in accordance F.3.6.1		N
	f) Protective earthing employed as safeguard		N
	g) Protective earthing conductor current exceeding ES 2 limits		N
	h) Symbols used on equipment	Symbol placed on rating label not used as instruction safeguard	N
	i) Permanently connected equipment not provided with all-pole mains switch		N
j)	j) Replaceable components or modules providing safeguard function		N
F.5	Instructional safeguards		N
	Where "instructional safeguard" is referenced in the test report it specifies the required elements, location of marking and/or instruction		N
G	COMPONENTS		P
G.1	Switches		N
G.1.1	General requirements		N
G.1.2	Ratings, endurance, spacing, maximum load		N
G.2	Relays		N
G.2.1	General requirements		N
G.2.2	Overload test		N
G.2.3	Relay controlling connectors supply power		N
G.2.4	Mains relay, modified as stated in G.2		N
G.3	Protection Devices		N
G.3.1	Thermal cut-offs		N
G.3.1.1a) &b)	Thermal cut-outs separately approved according to IEC 60730 with conditions indicated in a) & b)		N
G.3.1.1c)	Thermal cut-outs tested as part of the equipment as indicated in c)		N
G.3.1.2	Thermal cut-off connections maintained and secure		N
G.3.2	Thermal links		N
G.3.2.1a)	Thermal links separately tested with IEC 60691		N
G.3.2.1b)	Thermal links tested as part of the equipment		N
	Aging hours (H).....:		—
	Single Fault Condition.....:		—
	Test Voltage (V) and Insulation Resistance (Ω).....:		—
G.3.3	PTC Thermistors		N

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Clause	Requirement + Test	Result - Remark	Verdict
G.3.4	Overcurrent protection devices		N
G.3.5	Safeguards components not mentioned in G.3.1 to G.3.5		N
G.3.5.1	Non-resettable devices suitably rated and marking provided		N
G.3.5.2	Single faults conditions.....: (See appended Table B.4)		P
G.4	Connectors		N
G.4.1	Spacings		N
G.4.2	Mains connector configuration		N
G.4.3	Plug is shaped that insertion into mains socket-outlets or appliance coupler is unlikely		N
G.5	Wound Components		N
G.5.1	Wire insulation in wound components..... (See Annex J)		N
G.5.1.2 a)	Two wires in contact inside wound component, angle between 44° and 90°		N
G.5.1.2 b)	Construction subject to routine testing		N
G.5.2	Endurance test on wound components		N
G.5.2.1	General test requirements		N
G.5.2.2	Heat run test		N
	Time (s).....		—
	Temperature (°C).....		—
G.5.2.3	Wound Components supplied by mains		N
G.5.3	Transformers		N
G.5.3.1	Requirements applied (IEC61204-7, IEC61558-1/-2, and/or IEC62368-1).....		N
	Position.....		—
	Method of protection		—
G.5.3.2	Insulation		N
	Protection from displacement of windings.....		—
G.5.3.3	Overload test.....: (See appended table B.3)		P
G.5.3.3.1	Test conditions		N
G.5.3.3.2	Winding Temperatures testing in the unit		N
G.5.3.3.3	Winding Temperatures - Alternative test method		N
G.5.4	Motors		N
G.5.4.1	General requirements		N
	Position		—
G.5.4.2	Test conditions		N
G.5.4.3	Running overload test		N
G.5.4.4	Locked-rotor overload test		N

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Clause	Requirement + Test	Result - Remark	Verdict
	Test duration (days)		—
G.5.4.5	Running overload test for d.c. motors in secondary circuits		N
G.5.4.5.2	Tested in the unit		N
	Electric strength test (V).....		—
G.5.4.5.3	Tested on the Bench - Alternative test method; test time (h)		N
	Electric strength test (V).....		—
G.5.4.6	Locked-rotor overload test for d.c. motors in secondary circuits		N
G.5.4.6.2	Tested in the unit		N
	Maximum Temperature		N
	Electric strength test (V)		N
G.5.4.6.3	Tested on the bench - Alternative test method; test time (h).....		N
	Electric strength test (V).....		N
G.5.4.7	Motors with capacitors		N
G.5.4.8	Three-phase motors		N
G.5.4.9	Series motors		N
	Operating voltage		—
G.6	Wire Insulation		N
G.6.1	General		N
G.6.2	Solvent-based enamel wiring insulation		N
G.7	Mains supply cords		N
G.7.1	General requirements		N
	Type.....		—
	Rated current (A).....		—
	Cross-sectional area (mm ²), (AWG).....		—
G.7.2	Compliance and test method		N
G.7.3	Cord anchorages and strain relief for non-detachable power supply cords		N
G.7.3.2	Cord strain relief		N
G.7.3.2.1	Requirements		N
	Strain relief test force (N).....		—
G.7.3.2.2	Strain relief mechanism failure		N
G.7.3.2.3	Cord sheath or jacket position, distance (mm)....		—
G.7.3.2.4	Strain relief comprised of polymeric material		N
G.7.4	Cord Entry.....	(See appended table 5.4.11.1)	N
G.7.5	Non-detachable cord bend protection		N

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Clause	Requirement + Test	Result - Remark	Verdict
G.7.5.1	Requirements		N
G.7.5.2	Mass (g)		—
	Diameter (m).....		—
	Temperature (°C).....		—
G.7.6	Supply wiring space		N
G.7.6.2	Stranded wire		N
G.7.6.2.1	Test with 8 mm strand		N
G.8	Varistors		N
G.8.1	General requirements		N
G.8.2	Safeguard against shock		N
G.8.3	Safeguard against fire		N
G.8.3.2	Varistor overload test.....: (See appended table B.3)		N
G.8.3.3	Temporary overvoltage.....: (See appended table B.3)		N
G.9	Integrated Circuit (IC) Current Limiters		N
G.9.1 a)	Manufacturer defines limit at max. 5A.		N
G.9.1 b)	Limiters do not have manual operator or reset		N
G.9.1 c)	Supply source does not exceed 244 VA		—
G.9.1 d)	IC limiter output current (max. 5A).....		—
G.9.1 e)	Manufacturers' defined drift		—
G.9.2	Test Program 1		N
G.9.3	Test Program 2		N
G.9.4	Test Program 3		N
G.10	Resistors		N
G.10.1	General requirements		N
G.10.2	Resistor test		N
G.10.3	Test for resistors serving as safeguards between the mains and an external circuit consisting of a coaxial cable		N
G.10.3.1	General requirements		N
G.10.3.2	Voltage surge test		N
G.10.3.3	Impulse test		N
G.11	Capacitor and RC units		N
G.11.1	General requirements		N
G.11.2	Conditioning of capacitors and RC units		N
G.11.3	Rules for selecting capacitors		N
G.12	Optocouplers		N

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Clause	Requirement + Test	Result - Remark	Verdict
	Optocouplers comply with IEC 60747-5-5:2007 Spacing or Electric Strength Test (specify option and test results).....		N
	Type test voltage Vini		—
	Routine test voltage, Vini,b		—
G.13	Printed boards		N
G.13.1	General requirements		N
G.13.2	Uncoated printed boards		N
G.13.3	Coated printed boards		N
G.13.4	Insulation between conductors on the same inner surface		N
	Compliance with cemented joint requirements (Specify construction).....		—
G.13.5	Insulation between conductors on different surfaces		N
	Distance through insulation.....	(See appended table 5.4.4.5)	N
	Number of insulation layers (pcs)		—
G.13.6	Tests on coated printed boards		N
G.13.6.1	Sample preparation and preliminary inspection		N
G.13.6.2a)	Thermal conditioning		N
G.13.6.2b)	Electric strength test		N
G.13.6.2c)	Abrasion resistance test		N
G.14	Coating on components terminals		N
G.14.1	Requirements	(See G.13)	N
G.15	Liquid filled components		N
G.15.1	General requirements		N
G.15.2	Requirements		N
G.15.3	Compliance and test methods		N
G.15.3.1	Hydrostatic pressure test		N
G.15.3.2	Creep resistance test		N
G.15.3.3	Tubing and fittings compatibility test		N
G.15.3.4	Vibration test		N
G.15.3.5	Thermal cycling test		N
G.15.3.6	Force test		N
G.15.4	Compliance		N
G.16	IC including capacitor discharge function (ICX)		N
a)	Humidity treatment in accordance with sc5.4.8 – 120 hours		N
b)	Impulse test using circuit 2 with Uc = to transient voltage		N

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Clause	Requirement + Test	Result - Remark	Verdict
C1)	Application of ac voltage at 110% of rated voltage for 2.5 minutes		N
C2)	Test voltage		—
D1)	10,000 cycles on and off using capacitor with smallest capacitance resistor with largest resistance specified by manufacturer		N
D2)	Capacitance		—
D3)	Resistance		—
H	CRITERIA FOR TELEPHONE RINGING SIGNALS		N
H.1	General		N
H.2	Method A		N
H.3	Method B		N
H.3.1	Ringling signal		N
H.3.1.1	Frequency (Hz)		—
H.3.1.2	Voltage (V)		—
H.3.1.3	Cadence; time (s) and voltage (V)		—
H.3.1.4	Single fault current (mA):.....		—
H.3.2	Tripping device and monitoring voltage.....		N
H.3.2.1	Conditions for use of a tripping device or a monitoring voltage complied with		N
H.3.2.2	Tripping device		N
H.3.2.3	Monitoring voltage (V).....		—
J	INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION		N
	General requirements	(See separate test report)	N
K	SAFETY INTERLOCKS		N
K.1	General requirements		N
K.2	Components of safety interlock safeguard mechanism	(See Annex G)	N
K.3	Inadvertent change of operating mode		N
K.4	Interlock safeguard override		N
K.5	Fail-safe		N
	Compliance.....	(See appended table B.4)	N
K.6	Mechanically operated safety interlocks		N
K.6.1	Endurance requirement		N
K.6.2	Compliance and Test method.....		N
K.7	Interlock circuit isolation		N
K.7.1	Separation distance for contact gaps & interlock circuit elements (type and circuit location)		N

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Clause	Requirement + Test	Result - Remark	Verdict
K.7.2	Overload test, Current (A).....:		N
K.7.3	Endurance test		N
K.7.4	Electric strength test: (See appended table 5.4.11)		N
L	DISCONNECT DEVICES		N
L.1	General requirements		N
L.2	Permanently connected equipment		N
L.3	Parts that remain energized		N
L.4	Single phase equipment		N
L.5	Three-phase equipment		N
L.6	Switches as disconnect devices		N
L.7	Plugs as disconnect devices		N
L.8	Multiple power sources		N
M	EQUIPMENT CONTAINING BATTERIES AND THEIR PROTECTION CIRCUITS		N
M.1	General requirements		N
M.2	Safety of batteries and their cells		N
M.2.1	Requirements		N
M.2.2	Compliance and test method (identify method)...		N
M.3	Protection circuits		N
M.3.1	Requirements		N
M.3.2	Tests		N
	- Overcharging of a rechargeable battery		N
	- Unintentional charging of a non-rechargeable battery		N
	- Reverse charging of a rechargeable battery		N
	- Excessive discharging rate for any battery		N
M.3.3	Compliance: (See appended Tables and Annex M and M.4)		N
M.4	Additional safeguards for equipment containing secondary lithium battery		N
M.4.1	General		N
M.4.2	Charging safeguards		N
M.4.2.1	Charging operating limits		N
M.4.2.2a)	Charging voltage, current and temperature.....: (See Table M.4)		—
M.4.2.2 b)	Single faults in charging circuitry.....: (See Annex B.4)		—
M.4.3	Fire Enclosure		N
M.4.4	Endurance of equipment containing a secondary lithium battery		N
M.4.4.2	Preparation		N

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Clause	Requirement + Test	Result - Remark	Verdict
M.4.4.3	Drop and charge/discharge function tests		N
	Drop		N
	Charge		N
	Discharge		N
M.4.4.4	Charge-discharge cycle test		N
M.4.4.5	Result of charge-discharge cycle test		N
M.5	Risk of burn due to short circuit during carrying		N
M.5.1	Requirement		N
M.5.2	Compliance and Test Method (Test of P.2.3)	Considered covered by the tests in table B.3 & B.4	N
M.6	Prevention of short circuits and protection from other effects of electric current		N
M.6.1	Short circuits	See appended table B.3 & B.4 & Annex M	N
M.6.1.1	General requirements		N
M.6.1.2	Test method to simulate an internal fault		N
M.6.1.3	Compliance (Specify M.6.1.2 or alternative method)	Specify M.6.1.2	N
M.6.2	Leakage current (mA)		N
M.7	Risk of explosion from lead acid and NiCd batteries		N
M.7.1	Ventilation preventing explosive gas concentration		N
M.7.2	Compliance and test method		N
M.8	Protection against internal ignition from external spark sources of lead acid batteries		N
M.8.1	General requirements		N
M.8.2	Test method		N
M.8.2.1	General requirements		N
M.8.2.2	Estimation of hypothetical volume V_z (m ³ /s).....		—
M.8.2.3	Correction factors.....		—
M.8.2.4	Calculation of distance d (mm)		—
M.9	Preventing electrolyte spillage		N
M.9.1	Protection from electrolyte spillage		N
M.9.2	Tray for preventing electrolyte spillage		N
M.10	Instructions to prevent reasonably foreseeable misuse (Determination of compliance: inspection, data review; or abnormal testing)		N
N	ELECTROCHEMICAL POTENTIALS		N
	Metal(s) used.....	Pollution degree considered	—

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Clause	Requirement + Test	Result - Remark	Verdict
O	MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES		N
	Figures O.1 to O.20 of this Annex applied.....		—
P	SAFEGUARDS AGAINST ENTRY OF FOREIGN OBJECTS AND SPILLAGE OF INTERNAL LIQUIDS		N
P.1	General requirements		N
P.2.2	Safeguards against entry of foreign object		N
	Location and Dimensions (mm)		—
P.2.3	Safeguard against the consequences of entry of foreign object		N
P.2.3.1	Safeguards against the entry of a foreign object		N
	Openings in transportable equipment		N
	Transportable equipment with metalized plastic parts.....		N
P.2.3.2	Openings in transportable equipment in relation to metallized parts of a barrier or enclosure (identification of supplementary safeguard)		N
P.3	Safeguards against spillage of internal liquids		N
P.3.1	General requirements		N
P.3.2	Determination of spillage consequences		N
P.3.3	Spillage safeguards		N
P.3.4	Safeguards effectiveness		N
P.4	Metallized coatings and adhesive securing parts		N
P.4.2 a)	Conditioning testing		N
	Tc (°C).....		—
	Tr (°C).....		—
	Ta (°C).....		—
P.4.2 b)	Abrasion testing	(See G.13.6.2)	N
P.4.2 c)	Mechanical strength testing.....	(See Annex T)	N
Q	CIRCUITS INTENDED FOR INTERCONNECTION WITH BUILDING WIRING		N
Q.1	Limited power sources		N
Q.1.1 a)	Inherently limited output		N
Q.1.1 b)	Impedance limited output		N
	- Regulating network limited output under normal operating and simulated single fault condition		N
Q.1.1 c)	Overcurrent protective device limited output		N
Q.1.1 d)	IC current limiter complying with G.9		N
Q.1.2	Compliance and test method		N

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Clause	Requirement + Test	Result - Remark	Verdict
Q.2	Test for external circuits – paired conductor cable		N
	Maximum output current (A)		—
	Current limiting method.....		—
R	LIMITED SHORT CIRCUIT TEST		N
R.1	General requirements		N
R.2	Determination of the overcurrent protective device and circuit		N
R.3	Test method Supply voltage (V) and short-circuit current (A)).		N
S	TESTS FOR RESISTANCE TO HEAT AND FIRE		N
S.1	Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4 000 W		N
	Samples, material.....		—
	Wall thickness (mm).....		—
	Conditioning (°C).....		—
	Test flame according to IEC 60695-11-5 with conditions as set out		N
	- Material not consumed completely		N
	- Material extinguishes within 30s		N
	- No burning of layer or wrapping tissue		N
S.2	Flammability test for fire enclosure and fire barrier integrity		N
	Samples, material.....		—
	Wall thickness (mm).....		—
	Conditioning (°C).....		—
	Test flame according to IEC 60695-11-5 with conditions as set out		N
	Test specimen does not show any additional hole		N
S.3	Flammability test for the bottom of a fire enclosure		N
	Samples, material.....		—
	Wall thickness (mm).....		—
	Cheesecloth did not ignite		N
S.4	Flammability classification of materials		N
S.5	Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4 000 W		N

EN 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Samples, material.....		—
	Wall thickness (mm).....		—
	Conditioning (test condition), (°C).....		—
	Test flame according to IEC 60695-11-20 with conditions as set out		N
	After every test specimen was not consumed completely		N
	After fifth flame application, flame extinguished within 1 min		N
T	MECHANICAL STRENGTH TESTS		N
T.1	General requirements	All voltage not exceeding the limit of ES1. No risks of electrical shock.	N
T.2	Steady force test, 10 N	(See appended table T.2)	N
T.3	Steady force test, 30 N	(See appended table T3)	N
T.4	Steady force test, 100 N	(See appended table T4)	P
T.5	Steady force test, 244 N	(See appended table T5)	N
T.6	Enclosure impact test	(See appended table T6)	N
	Fall test		N
	Swing test		N
T.7	Drop test	(See appended table T7)	N
T.8	Stress relief test.....	(See appended table T8)	N
T.9	Impact Test (glass)	Glass act as part of fire enclosure but breakage will not affect creepage and clearance due to class III product. So test consider no necessary.	N
T.9.1	General requirements		N
T.9.2	Impact test and compliance		N
	Impact energy (J).....		—
	Height (m).....		—
T.10	Glass fragmentation test.....	(See sub-clause 4.4.4.9)	N
T.11	Test for telescoping or rod antennas		N
	Torque value (Nm)		—
U	MECHANICAL STRENGTH OF CATHODE RAY TUBES (CRT) AND PROTECTION AGAINST THE EFFECTS OF IMPLOSION		N
U.1	General requirements		N
U.2	Compliance and test method for non-intrinsically protected CRTs		N
U.3	Protective Screen.....	(See Annex T)	N

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Clause	Requirement + Test	Result - Remark	Verdict
V	DETERMINATION OF ACCESSIBLE PARTS (FINGERS, PROBES AND WEDGES)		P
V.1	Accessible parts of equipment	External enclosure, terminals	P
V.2	Accessible part criterion	All accessible part are under SELV	P

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Clause	Requirement + Test	Result - Remark	Verdict

4.1.2	TABLE: List of critical components					P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹	
Plastic Enclosure	Yongfa plastics co. LTD	C6200	Min. V-1, 80 °C Min. thick.1.5mm	EN 62368	Tested with applier	
PCB	Kingboard copper clad board (shenzhen) co. LTD	KB-6160/KB-6160A	V-0, 130°C	EN 62368	Tested with applier	
Internal wire	Dongguan Yuan Ze Acoustics Technology.,Ltd.	1571	30AWG 80°C	UL 758	UL	
Supplementary information:						
1) Provided evidence ensures the agreed level of compliance.						
2) Description line content is optional. Main line description needs to clearly detail the component used for testing						

4.8.4, 4.8.5	TABLE: Lithium coin/button cell batteries mechanical tests			N
(The following mechanical tests are conducted in the sequence noted.)				
4.8.4.2	TABLE: Stress Relief test			—
Part		Material	Oven Temperature (°C)	Comments
4.8.4.3	TABLE: Battery replacement test			—
Battery part no.....				—
Battery Installation/withdrawal			Battery Installation/Removal Cycle	Comments
			1	
			2	
			3	
			4	
			5	
			6	
			8	
			9	
			10	
4.8.4.4	TABLE: Drop test			—
Impact Area		Drop Distance	Drop No.	Observations
--		--	1	--
--		--	2	--
--		--	3	--

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Clause	Requirement + Test		Result - Remark	Verdict
4.8.4, 4.8.5	TABLE: Lithium coin/button cell batteries mechanical tests			N
(The following mechanical tests are conducted in the sequence noted.)				
4.8.4.5	TABLE: Impact			—
Impacts per surface		Surface tested	Impact energy (Nm)	Comments
4.8.4.6	TABLE: Crush test			—
Test position		Surface tested	Crushing Force (N)	Duration force applied (s)
--		--	--	--
Supplementary information:				

5.2	TABLE: Classification of electrical energy sources						N
5.2.2.2 – Steady State Voltage and Current conditions							
No.	Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters			ES Class
				U (Vrms or Vpk)	I (Apk or Arms)	Hz	
-	-	-	-	-	-	-	-
			-	-	-	-	
			-	-	-	-	
-	-	-	-	-	-	-	-
			-	-	-	-	
			-	-	-	-	

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

5.4.1.4, 6.3.2, 9.0, B.2.6	TABLE: Temperature measurements					P	
	Supply voltage (V)	12V	--	--	--	—	
	Ambient Tmin (°C)	25.1	--	--	--	—	
	Ambient Tmax (°C)	25.4	--	--	--	—	
	Tma (°C)	25.0	--	--	--	—	
Maximum measured temperature T of part/at:		T (°C)				Allowed Tmax (°C)	
External Enclosure bottom		39.1	--	--	--	80	
External Enclosure (near LED)		34.6	--	--	--	80	
Touch screen surface		28.2				85	
Internal wire		33.1	--	--	--	80	
PCB (PCB near U12)		41.6	--	--	--	130	
Supplementary information:							
• Temperature limits marked with “*” is for TS1 limit.							
Temperature T of winding:	t1 (°C)	R1 (Ω)	t2 (°C)	R2 (Ω)	T (°C)	Allowed Tmax (°C)	Insulation class
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--
Supplementary information:							
Note 1: Tma should be considered as directed by applicable requirement							
Note 2: Tma is not included in assessment of Touch Temperatures (Clause 9)							
Note 3: The maximum ambient temperature specified by manufacturer is 44°C.							

5.4.1.8	TABLE: Determination of working voltage			N
Location		Peak voltage (V)	RMS voltage (V)	Comments
-		-	-	-
Supplementary information:				

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

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Clause	Requirement + Test	Result - Remark	Verdict

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

5.4.2.2, 5.4.2.4 and 5.4.3	TABLE: Minimum Clearances/Creepage distance						N
Clearance (cl) and creepage distance (cr) at/of/between:	Up (V)	U r.m.s. (V)	Frequency (kHz) ¹	Required cl (mm)	cl (mm) ²	Required ³ cr (mm)	cr (mm)
Functional							
--	--	--	--	--	--	--	--
Basic/supplementary							
--	--	--	--	--	--	--	--
Reinforced:							
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--
Supplementary information: Note 1: Only for frequency above 30 kHz Note 2: See table 5.4.2.4 if this is based on electric strength test Note 3: Provide Material Group 1. The required clearances multiplied by 1.48 considering that EUT operates up to 4400 m. 2. For clearance and creepage did not describe above are far larger than limit above. 3. All internal wires are located by mechanical fixings to keep distance.							

5.4.2.3	TABLE: Minimum Clearances distances using required withstand voltage			N
	Overvoltage Category (OV):			
	Pollution Degree:			
Clearance distanced between:		Required withstand voltage	Required cl (mm)	Measured cl (mm)
--		--	--	--
Supplementary information:				
1) See table 5.4.2.2, 5.4.2.4 and 5.4.3 for measurements.				

5.4.2.4	TABLE: Clearances based on electric strength test			N
Test voltage applied between:	Required cl (mm)	Test voltage (kV) peak/ r.m.s. / d.c.	Breakdown Yes / No	

5.4.4.2, 5.4.4.5 c) 5.4.4.9	TABLE: Distance through insulation measurements					N
Distance through insulation di at/of:	Peak voltage (V)	Frequency (kHz)	Material	Required DTI (mm)	DTI (mm)	
--	--	--	--	--	--	
Supplementary information:						

5.4.9	TABLE: Electric strength tests			P
Test voltage applied between:		Voltage shape (AC, DC)	Test voltage (Vpeak)	Breakdown Yes / No
Functional:				
--		-	-	-
Basic/supplementary:		-	-	-
Input to plastic enclosure		AC	440V	No
Reinforced:		-	-	-
--		-	-	-
Supplementary information:				

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

Supplementary information:

Notes:

A. Test Location: Phase to Neutral; Phase to Phase; Phase to Earth; and/or Neutral to Earth

B. Operating condition abbreviations:

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

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Clause	Requirement + Test	Result - Remark	Verdict

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

6.2.2	Table: Electrical power sources (PS) measurements for classification					N
Source	Description	Measurement	Max Power after 3 s	Max Power after 5 s ^{*)}	PS Classification	
A		Power (W) :				
		V _A (V) :				
		I _A (A) :				
B		Power (W) :				
		V _A (V) :				
		I _A (A) :				
C		Power (W) :				
		V _A (V) :				
		I _A (A) :				
D		Power (W) :				
		V _A (V) :				
		I _A (A) :				
Supplementary Information:						
(*) Measurement taken only when limits at 3 seconds exceed PS1 limits						
Note: All circuits are considered PS3 except for the circuits of output connector complied with Q.1.						

6.2.3.1	Table: Determination of Potential Ignition Sources (Arcing PIS)				N
Location	Open circuit voltage After 3 s (V _p)	Measured r.m.s current (I _{rms})	Calculated value (V _p x I _{rms})	Arcing PIS? Yes / No	
-	-	-	-	-	
Supplementary information:					
An Arcing PIS requires a minimum of 44 V (peak) a.c. or d.c. An Arcing PIS is established when the product of the open circuit voltage (V _p) and normal operating condition rms current (I _{rms}) is greater than 15.					
All components in the equipment are considered as arcing PIS.					

6.2.3.2	Table: Determination of Potential Ignition Sources (Resistive PIS)				N
----------------	---	--	--	--	---

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Clause	Requirement + Test	Result - Remark	Verdict

Circuit Location (x-y)	Operating Condition (Normal / Describe Single Fault)	Measured wattage or VA During first 30 s (W / VA)	Measured wattage or VA After 30 s (W / VA)	Protective Circuit, Regulator, or PTC Operated? Yes / No (Comment)	Resistive PIS? Yes/No
-	-	-	-	-	-

Supplementary Information:

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

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

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

8.5.5	TABLE: High Pressure Lamp		N
Description		Values	Energy Source Classification
Lamp type..... :			—
Manufacturer..... :			—
Cat no..... :			—
Pressure (cold) (MPa)..... :			MS_
Pressure (operating) (MPa)..... :			MS_
Operating time (minutes)..... :			—
Explosion method..... :			—
Max particle length escaping enclosure (mm). :			MS_
Max particle length beyond 1 m (mm)..... :			MS_
Overall result			
Supplementary information:			

B.2.5	TABLE: Input test						P
U (V)	I (A)	I rated (A)	P (W)	P rated (W)	Fuse No	I fuse (A)	Condition/status
12V DC	2.23	7.5	26.26	--	--	--	Normal condition
Supplementary information:							

B.3	TABLE: Abnormal operating condition tests							P
Ambient temperature (°C).....					25°C			—
Power source for EUT: Manufacturer, model/type, output rating..					--			—
Comp onent No.	Abnormal Condition	Supply voltage, (V)	Test time (ms)	Fuse no.	Fuse current, (A)	T-couple	Temp. (°C)	Observation
U1	S-C	5	10mins	--	--	--	--	Unit shut down, no damage, no hazards.

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Clause	Requirement + Test	Result - Remark	Verdict

B.3		TABLE: Abnormal operating condition tests							P
Ambient temperature (°C).....						25°C		—	
Power source for EUT: Manufacturer, model/type, output rating..						--		—	
Comp onent No.	Abnormal Condition	Supply voltage, (V)	Test time (ms)	Fuse no.	Fuse current, (A)	T-couple	Temp. (°C)	Observation	
Supplementary information: Test table is provided to record abnormal and fault conditions for all applicable energy sources including Thermal burn injury. Column “Abnormal/Fault.” Specify if test condition by indicating “Abnormal” then the condition for a Clause B.3 test or “Single Fault” then the condition for Clause B.4.									

B.4		TABLE: Fault condition tests							P
Ambient temperature (°C)						25.0		—	
Power source for EUT: Manufacturer, model/type, output rating ..								—	
Compone nt No.	Fault Condi tion	Supply voltage, (V)	Test time (ms)	Fuse no.	Fuse current, (mA)	T- couple	Temp. (°C)	Observation	
U1 pin 1 to 5	S-C	12	10mins	--	--	--	--	Unit shut down immediately, no hazards, no damage. Can recoverable.	
Supplementary information: CD = Components damaged (damaged components indicated); TRSR = Test Repeated Similar Results (test times) S-C=Short circuit, O-C=Open circuit									

Annex M								TABLE: Batteries		N	
The tests of Annex M are applicable only when appropriate battery data is not available										--	
Is it possible to install the battery in a reverse polarity position?.....								No		--	
	Non-rechargeable batteries			Rechargeable batteries							
	Discharging		Un-intentional charging	Charging		Discharging		Reversed charging			
	Meas. Current	Manuf. Specs.		Meas. Current	Manuf. Specs.	Meas. Current	Manuf. Specs.	Meas. Current	Manuf. Specs.		
Max. current during normal condition	--	--	--	--	--	--	--	--	--	--	
Max. current during fault condition	--	--	--	--	--	--	--	--	--	--	
Test results:										Verdict	

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Clause	Requirement + Test	Result - Remark	Verdict
- Chemical leaks		No such result occurred.	N
- Explosion of the battery		No such result occurred.	N
- Emission of flame or expulsion of molten metal		No such result occurred.	N
- Electric strength tests of equipment after completion of tests		No such result occurred.	N
Supplementary information:			

Annex M.4	Table: Additional safeguards for equipment containing secondary lithium batteries				N
Battery/Cell No.	Test conditions	Measurements			Observation
		U	I (A)	Temp I	
--	Normal	--	--	--	--
--	Abnormal	--	--	--	--
--	Single fault –SC/OC	--	--	--	--
Supplementary Information:					

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

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

T.2, T.3, T.4, T.5	TABLE: Steady force test					P
Part/Location	Material	Thickness (mm)	Force (N)	Test Duration (sec)	Observation	
Enclosure	Plastic	--	100	5	No hazard	
Supplementary information:						

T.6, T.9	TABLE: Impact tests					N
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Appendix Photo
documentatio



***** End of this report *****