Safety Test Report

Report No.: AGC05443260822ES01

PRODUCT DESIGNATION	:	Speaker
BRAND NAME	:	N/A
MODEL NAME	:	MO2211
APPLICANT	:	MID OCEAN BRANDS B.V.
DATE OF ISSUE	:	Sep. 18, 2026
STANDARD(S)	:	EN IEC 62368-1:2024+A11:2024
REPORT VERSION	:	V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd.

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TEST REPORT
EN IEC 62368-1
Audio/video, information and communication technology equipment
Part 1: Safety requirements

Report Number. ..... :	AGC05443260822ES01
Tested by(+ signature). ..... :	Mody Mo
Reviewed by (+ signature). ..... :	Albert Liang
Approved by (+ signature). ..... :	Michael Yu (Authorized Officer)
Date of issue..... :	Sep. 18, 2026
Total number of pages..... :	Total 85 pages

Testing laboratory

Name ..... :	Attestation of Global Compliance (Shenzhen) Co., Ltd.
Address ..... :	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Testing location ..... :	Same as above.

Applicant

Name ..... :	MID OCEAN BRANDS B.V.
Address ..... :	Unit 711-716, 7/F., Tower A, 83 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong.

Manufacturer

Name ..... :	MID OCEAN BRANDS B.V.
Address ..... :	Unit 711-716, 7/F., Tower A, 83 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong.

Factory

Name ..... :	MID OCEAN BRANDS B.V.
Address ..... :	Unit 711-716, 7/F., Tower A, 83 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong.

Test specification:

Standard ..... :	EN IEC 62368-1:2024+A11:2024
Test procedure ..... :	Type test
Procedure deviation ..... :	N/A
Non-standard test method ..... :	N/A

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Test Report Form/blank test report	
Test Report Form No. ..... :	AGC62368A4
TRF originator. ..... :	AGC
Master TRF ..... :	2023-08
Test item	
Test item description. .....:	Speaker
Trade Mark .....:	N/A
Test model.....:	MO2211
Series model.....:	N/A
Ratings .....:	Input: 5V⎓1A
Test item particulars	
Product group..... :	☒ end product ☐ built-in component
Classification of use by ..... :	☒ Ordinary person ☒ Children likely present ☐ Instructed person ☐ Skilled person
Supply connection..... :	☐ AC mains ☐ DC mains ☒ 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 ☐ pluggable equipment type B - ☐ non-detachable supply cord ☐ appliance coupler ☐ permanent connection ☐ mating connector ☒ other: not mains connected
Considered current rating of protective device..... :	☐ 16A (20A for US and Canada, 13A for UK); Location: ☐ building ☐ equipment ☒ N/A
Equipment mobility ..... :	☒ movable ☐ hand-held ☒ transportable ☐ direct plug-in ☐ stationary ☐ for building-in ☐ wall/ceiling-mounted ☐ SRME/rack-mounted ☐ other:

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Overvoltage category (OVC) ..... :	☐ OVC I ☐ OVC II ☐ OVC III ☐ OVC IV ☒ other: not mains connected
Class of equipment..... :	☐ Class I ☐ Class II ☐ Class II with functional earthing ☒ Class III ☐ Not classified ☐
Special installation location ..... :	☒ N/A ☐ restricted access area ☐ outdoor location ☐
Pollution degree (PD) ..... :	☐ PD 1 ☒ PD 2 ☐ PD 3
Manufacturer's specified T_{ma} ..... :	40°C ☐ Outdoor: minimum °C
IP protection class ..... :	☒ IPX0 ☐ IP
Power systems ..... :	☐ TN ☐ TT ☐ IT - V_{L-L} ☒ not AC mains
Altitude during operation (m) ..... :	☒ 2000 m or less ☐ m
Altitude of test laboratory (m) ..... :	☒ 2000 m or less ☐ m
Mass of equipment (kg) ..... :	0.412 kg

Possible test case verdicts:

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

Testing:

Date of receipt of test item..... : Aug. 10, 2026

Date (s) of performance of tests..... : Aug. 10, 2026 -- Sep. 16, 2026

Attachments:

Attachment A..... : Photos of product

General remarks:

This report shall not be reproduced except in full without the written approval of the testing laboratory.
The test results presented in this report relate only to the item tested.
"(See remark #)" refers to a remark appended to the report.
"(See appended table)" refers to a table appended to the report.
Throughout this report a point is used as the decimal separator.

Report Revise Record:

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Sep. 18, 2026	Valid	Initial release

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General product information and other remarks:

The product is Speaker which supplied by Li-ion battery. The battery charged by adapter via Type-C interface. It is considered a transportable apparatus, and for dry location used only.
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.
The product was submitted and tested for use at the manufacturer's recommended ambient temperature (Tma) of 40°C.

Summary of testing:

The product fulfils the requirements of EN IEC 62368-1:2024+A11:2024.

Copy of marking plate:

Remark:
1) The CE marking and WEEE symbol (if any) should be at least 5mm and 7mm respectively in height.
2) The markings and instructions are the minimum requirements required by safety standard. For final production samples, the additional markings which do not give rise to misunderstanding may be added.
3) As declared by the applicant, the importer (and manufacturer, if it is different)'s name, registered trade name or mark and the postal address will be marked on the products before being place on the market.
4) Marking on the packaging or in a document accompanying the electrical equipment is only acceptable if it is not possible to place such markings on the product.

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OVERVIEW OF ENERGY SOURCES AND SAFEGUARDS				
Clause	**Possible Hazard**			
5	Electrically-caused injury			
Class and Energy Source (e.g. ES3: Primary circuit)	Body Part (e.g. Ordinary)	Safeguards		
		B	S	R
ES1: All Internal circuits	Ordinary person	N/A	N/A	N/A
6	Electrically-caused fire			
Class and Energy Source (e.g. PS2: 100 Watt circuit)	Material part (e.g. Printed board)	Safeguards		
		B	1st S	2nd S
PS2: Internal circuit PS2: Type-C input PS2: Battery cell	All Flammable materials inside and plastic enclosure	1. No ignition occurred. 2. No parts exceeding 90% of its spontaneous ignition temperature.	1. PCB is complied with V-0 material. 2. all other components: at least V-2 except for mounted on min. V-1 material or small parts of combustible material. 3. Fire enclosure rated V-0 used.	N/A
7	Injury caused by hazardous substances			
Class and Energy Source (e.g. Ozone)	Body Part (e.g., Skilled)	Safeguards		
		B	S	R
Li-ion battery	Ordinary person	N/A	N/A	Complied with the annex M
8	Mechanically-caused injury			
Class and Energy Source (e.g. MS3: Plastic fan blades)	Body Part (e.g. Ordinary)	Safeguards		
		B	S	R
MS1: Edges and corners	Ordinary person	N/A	N/A	N/A
MS1: Mass of equipment	Ordinary person	N/A	N/A	N/A
9	Thermal burn			
Class and Energy Source (e.g. TS1: Keyboard caps)	Body Part (e.g., Ordinary)	Safeguards		
		B	S	R
TS1: All accessible parts	Ordinary person	N/A	N/A	N/A
10	Radiation			
Class and Energy Source (e.g. RS1: PMP sound output)	Body Part (e.g., Ordinary)	Safeguards		
		B	S	R
Exempt group: Indicator LED	Ordinary person	N/A	N/A	N/A

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Supplementary Information:
“B” – Basic Safeguard; “S” – Supplementary Safeguard; “R” – Reinforced Safeguard

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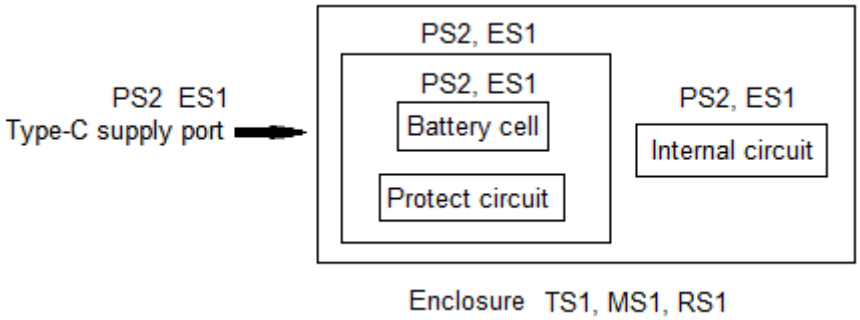
ENERGY SOURCE DIAGRAM
Optional. Manufacturers are to provide the energy sources diagram identify declared energy sources and identifying the demarcations are between power sources. Recommend diagram be provided included in power supply and multipart systems. Insert diagram below. Example diagram designs are; Block diagrams; image(s) with layered data; mechanical drawings



☒ **ES** ☒ **PS** ☒ **MS** ☒ **TS** ☒ **RS**

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EN IEC 62368-1			
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	(See appended table 4.1.2)	P
4.1.3	Equipment design and construction		P
4.1.4	Specified ambient temperature for outdoor use (^{o}C) ..... :		N
4.1.5	Constructions and components not specifically covered		N
4.1.8	Liquids, refrigerants and liquid filled components (LFCs)		N
4.1.15	Markings and instructions	(See Annex F)	P
4.4.3	Safeguard robustness	See below	P
4.4.3.1	General		P
4.4.3.2	Steady force tests	(See Annex T.4)	P
4.4.3.3	Drop tests	(See Annex T.7)	P
4.4.3.4	Impact tests		N
4.4.3.5	Internal accessible safeguard tests		N
4.4.3.6	Glass impact tests		N
4.4.3.7	Glass fixation test		N
	Glass impact test (1J)		N
	Push/pull test (10 N)		N
4.4.3.8	Thermoplastic material tests	(See Annex T.8)	P
4.4.3.9	Air comprising a safeguard		N
4.4.3.10	Accessibility, glass, safeguard effectiveness	Safeguard remain effective.	P
4.4.4	Displacement of a safeguard by an insulating liquid		N
4.4.5	Safety interlocks	(See Annex K)	N
4.5	**Explosion**		**P**
4.5.1	General	No explosion occurs during normal/abnormal operation and single fault conditions	P
4.5.2	No explosion during normal/abnormal operating conditions	(See Clause B.2, B.3)	P
	No harm by explosion during single fault conditions	(See Clause B.4)	P
4.6	**Fixing of conductors and conductive parts**		**N**

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EN IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Fix conductors and conductive parts not to defeat a safeguard	Not defeat a safeguard.	N
	Compliance is checked by test ..... :		N
4.7	**Equipment for direct insertion into mains socket–outlets**		**N**
4.7.2	Mains plug part complies with relevant standard.... :		N
4.7.3	Torque (Nm) ..... :		N
4.8	**Equipment containing coin or button cell batteries**		**N**
4.8.1	General	No coin/ button cell batteries	N
4.8.2	Instructional safeguard ..... :		N
4.8.3	Coin or button cell battery compartment, door or cover construction		N
	Open torque test		N
4.8.4.2	Stress relief test		N
4.8.4.3	Battery replacement test		N
4.8.4.4	Drop test		N
4.8.4.5	Impact test		N
4.8.4.6	Crush test		N
4.8.5	Compliance		N
	30N force test with test probe		N
	20N force test with test hook		N
4.9	**Likelihood of fire or shock due to entry of conductive object**		**N**
4.10	**Component requirements**		**N**
4.10.1	Disconnect device	(See Annex L)	N
4.10.2	Switches and relays	(See Annex G.1)	N
4.10.3	Mains power supply cords	(See Annex G.7)	N
4.10.4	Batteries and their protection circuits	(See Annex M)	N
5	**ELECTRICALLY-CAUSED INJURY**		**P**
5.2	**Classification and limits of electrical energy sources**		**P**
5.2.2	ES1 and ES2 limits	(See appended table 5.2)	P
5.2.2.2	Steady-state voltage and current limits..... :	ES1	P
5.2.2.3	Capacitance limits ..... :		N
5.2.2.4	Single pulse limits..... :		N
5.2.2.5	Limits for repetitive pulses..... :		N
5.2.2.6	Ringing signals	(See Annex H)	N

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EN IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.2.2.7	Audio signals	(See Clause E.1)	N
5.3	**Protection against electrical energy sources**		**N**
5.3.1	General Requirements for accessible parts to ordinary, instructed and skilled persons		N
5.3.1 a)	ES2/ES3 circuits that are not ES2/ES3 mains		N
5.3.1 b)	Skilled persons not unintentional contact ES3 bare conductors		N
5.3.2.1	Accessibility to electrical energy sources and safeguards		N
	Accessibility to outdoor equipment bare parts		N
5.3.2.2	Contact requirements		N
	Test with test probe from Annex V..... :		—
5.3.2.2 a)	Air gap – electric strength test potential (V)..... :		N
5.3.2.2 b)	Air gap – distance (mm) ..... :		N
5.3.2.3	Compliance		N
5.3.2.4	Terminals for connecting stripped wire		N
5.4	**Insulation materials and requirements**		**N**
5.4.1.2	Properties of insulating material		N
5.4.1.3	Compliance		N
	Non-hygroscopic materials		N
5.4.1.4	Maximum operating temperature for insulating materials ..... :		N
5.4.1.5	Pollution degrees..... :		—
5.4.1.5.2	Test for pollution degree 1 environment and for an insulating compound		N
5.4.1.5.3	Thermal cycling test		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 test ..... :		N
5.4.1.10.3	Ball pressure test..... :		N

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EN IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.4.2	Clearances		N
5.4.2.1	General requirements		N
	Clearances in circuits connected to AC Mains, Alternative method		N
5.4.2.2	Procedure 1 for determining clearance		N
	Temporary overvoltage ..... :		—
5.4.2.3	Procedure 2 for determining clearance		N
5.4.2.3.2.2	AC mains transient voltages ..... :		—
5.4.2.3.2.3	DC mains transient voltages ..... :		—
5.4.2.3.2.4	External circuit transient voltages ..... :		—
5.4.2.3.2.5	Transient voltage determined by measurement..... :		—
5.4.2.3.3	Exceptions of determining required withstand voltage ..... :		N
5.4.2.3.4	Determining clearances using required withstand voltage..... :		N
5.4.2.4	Determining the adequacy of a clearance using an electric strength test ..... :		N
5.4.2.5	Multiplication factors for clearances and test voltages ..... :		—
5.4.2.6	Clearance measurement..... :		N
5.4.3	Creepage distances		N
5.4.3.1	General		N
5.4.3.3	Material group and CTI..... :		—
5.4.3.4	Creepage distances measurement..... :		N
5.4.4	Solid insulation		N
5.4.4.1	General requirements		N
5.4.4.2	Minimum distance through insulation ..... :		N
5.4.4.3	Insulating compound forming solid insulation		N
5.4.4.4	Solid insulation in semiconductor devices		N
5.4.4.5	Insulating compound forming 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

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Clause	Requirement + Test	Result - Remark	Verdict
	Number of layers (pcs).....:		N
5.4.4.6.4	Standard test procedure for non-separable thin sheet material .....:		N
5.4.4.6.5	Mandrel test		N
5.4.4.7	Solid insulation in wound components		N
5.4.4.9	Solid insulation at frequencies >30 kHz, E_P, K_R, d, V_{PW} (V) .....:		N
	Alternative by electric strength test, tested voltage (V), K_R .....:		N
5.4.5	Antenna terminal insulation		N
5.4.5.1	General		N
5.4.5.2	Voltage surge test		N
5.4.5.3	Insulation resistance (MΩ) .....:		N
	Electric strength test ..... :		N
5.4.6	Insulation of internal wire as part of supplementary safeguard		N
5.4.7	Tests for semiconductor components and for cemented joints		N
5.4.8	Humidity conditioning		N
	Relative humidity (%), temperature (°C), duration (h) .....:		—
5.4.9	Electric strength test		N
5.4.10	Safeguards against transient voltages from external circuits		N
5.4.10.1	Parts and circuits separated from external circuits		N
5.4.10.2	Test methods		N
5.4.10.2.1	General		N
5.4.10.2.2	Impulse test.....:		N
5.4.10.2.3	Steady-state test .....:		N
5.4.10.3	Verification for insulation breakdown .....:		N
5.4.11	Separation between external circuits and earth		N
5.4.11.1	Exceptions to separation between external circuits and earth		N
5.4.11.2	Requirements		N
	Surge suppressors bridge separation between external circuit and earth		N
	Rated operating voltage U_{op} (V) .....:		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Nominal voltage U_{peak} (V) .....:		—
	Max increase due to variation ΔU_{sp} .....:		—
	Max increase due to ageing ΔU_{sa} .....:		—
5.4.11.3	Test method and compliance.....:		N
	Test voltage (V) of additional test .....:		—
	Measured current (mA) of additional test.....:		N
5.4.12	Insulating liquid		N
5.4.12.1	General requirements		N
5.4.12.2	Electric strength of an insulating liquid .....:		N
5.4.12.3	Compatibility of an insulating liquid		N
	Thermal classification of IEC 60085 .....:		—
5.4.12.4	Container for insulating liquid		N
5.5	**Components as safeguards**		**N**
5.5.1	General		N
5.5.2	Capacitors and RC units		N
5.5.2.1	General requirement		N
5.5.2.2	Capacitor discharge after disconnection of a connector .....:		N
5.5.3	Transformers		N
5.5.4	Optocouplers		N
5.5.5	Relays		N
5.5.6	Resistors		N
	Application type of resistors.....:		—
5.5.7	Surge suppressors		N
	GDT……:		N
5.5.8	Insulation between the mains and an external circuit consisting of a coaxial cable .....:		N
	Insulation resistance (MΩ) .....:		N
	Electric strength test..... :		N
5.5.9	Safeguards for socket-outlets in outdoor equipment		N
	RCD rated residual operating current (mA) .....:		—
5.6	**Protective conductor**		**N**
5.6.2	Requirements for protective conductors		N
5.6.2.1	General requirements		N

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Clause	Requirement + Test	Result - Remark	Verdict
5.6.2.2	Colour of insulation		N
5.6.3	Requirements for protective earthing conductors		N
	Protective earthing conductor size (mm^2) .....:		—
	Protective earthing conductor serving as a reinforced safeguard		N
	Protective earthing conductor serving as a double safeguard		N
5.6.4	Requirements for protective bonding conductors		N
5.6.4.1	Protective bonding conductors		N
	Protective bonding conductor size (mm^2). .....:		—
5.6.4.2	Protective current rating (A) .....:		—
5.6.5	Terminals for protective conductors		N
5.6.5.1	Terminal size for connecting protective earthing conductors (mm) .....:		N
	Terminal size for connecting protective bonding conductors (mm)..... :		N
	Relevant IEC standard ..... :		N
5.6.5.2	Corrosion		N
5.6.6	Resistance of the protective bonding system		N
5.6.6.1	Requirements		N
5.6.6.2	Test method .....:		N
5.6.6.3	Resistance (Ω) or voltage drop .....:		N
5.6.7	Reliable connection of a protective earthing conductor		N
5.6.8	Functional earthing		N
	Conductor size (mm^2) .....:		N
	Class II with functional earthing marking .....:		N
	Appliance inlet cl & cr (mm) .....:		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		N
5.7.2.2	Measurement of voltage		N
5.7.3	Equipment set-up, supply connections and earth connections		N
5.7.4	Unearthed accessible parts .....:		N

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Clause	Requirement + Test	Result - Remark	Verdict
5.7.5	Earthed accessible conductive parts ..... :		N
5.7.6	Requirements when touch current exceeds ES2 limits		N
	Protective conductor current (mA) ..... :		N
	Instructional Safeguard ..... :		N
5.7.7	Prospective touch voltage and touch current associated with external circuits		N
5.7.7.1	Touch current from coaxial cables		N
5.7.7.2	Prospective touch voltage and touch current associated with paired conductor cables		N
5.7.8	Summation of touch currents from external circuits		N
	a) Equipment connected to an earthed external circuit, current (mA)..... :		N
	b) Equipment connected to an unearthed external circuit, current (mA)..... :		N
5.8	**Backfeed safeguard in battery backed up supplies**		**N**
	Mains terminal ES ..... :		N
	Air gap (mm) ..... :		N
6	**ELECTRICALLY- CAUSED FIRE**		**P**
6.2	**Classification of power sources and potential ignition sources**		**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.	P
6.2.3	Classification of potential ignition sources	(See appended table 6.2.2)	P
6.2.3.1	Arcing PIS ..... :		N
6.2.3.2	Resistive PIS ..... :	(See appended table 6.2.3.2)	P
6.3	**Safeguards against fire under normal operating and abnormal operating conditions**		**P**
6.3.1	No ignition and attainable temperature value less than 90 % defined by ISO 871 or less than 300 °C for unknown materials ..... :	(See appended table 5.4.1.4, 9.3, B.1.5 and B.2.6)	P
	Combustible materials not inside a fire enclosure.... :	No such materials used.	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 fau lt conditions in PS1 circuits		N

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Clause	Requirement + Test	Result - Remark	Verdict
6.4.3	Reduction of the likelihood of ignition under single fault conditions in PS2 and PS3 circuits	Method by control of fire spread.	N
6.4.3.1	Supplementary safeguards		N
6.4.3.2	Single fault conditions.....:		N
	Special conditions for temperature limited by fuse		N
6.4.4	Control of fire spread in PS1 circuits		N
6.4.5	Control of fire spread in PS2 circuits	See the following details.	P
6.4.5.2	Supplementary safeguards	Compliance detailed as follows: Printed board: rated V-0. Plastic enclosure: V-0 All other components: at least V-2/VTM-2 except for mounted on min. V-1 material or small parts (<4g) of combustible material.	P
6.4.6	Control of fire spread in PS3 circuits		N
6.4.7	Separation of combustible materials from a PIS		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	Fire enclosure used.	P
6.4.8.2	Fire enclosure and fire barrier material properties	See the following details.	P
6.4.8.2.1	Requirements for a fire barrier	No such construction.	N
6.4.8.2.2	Requirements for a fire enclosure	Plastic enclosure V-0	P
6.4.8.3	Constructional requirements for a fire enclosure and a fire barrier		N
6.4.8.3.1	Fire enclosure and fire barrier openings		N
6.4.8.3.2	Fire barrier dimensions		N
6.4.8.3.3	Top openings and properties		N
	Openings dimensions (mm).....:		N
	Flammability tests for the top of a fire enclosure		N
6.4.8.3.4	Bottom openings and properties		N
	Openings dimensions (mm).....:		N
	Flammability tests for the bottom of a fire enclosure		N
	Instructional Safeguard .....:		N
6.4.8.3.5	Side openings and properties		N
	Openings dimensions (mm).....:		N

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Clause	Requirement + Test	Result - Remark	Verdict
6.4.8.3.6	Integrity of a fire enclosure, condition met: a), b) or c) .....:		N
6.4.8.4	Separation of a PIS from a fire enclosure and a fire barrier distance (mm) or flammability rating .....:	Plastic enclosure V-0	P
6.4.9	Flammability of insulating liquid	See the following details.	N
	Auto ignition temperature (°C) .....:		N
	Flashpoint temperature (°C) .....:		N
6.5	**Internal and external wiring**		**P**
6.5.1	General requirements	(See appended table 4.1.2)	P
6.5.2	Requirements for interconnection to building wiring .....:		N
6.5.3	Internal wiring size (mm^2) for socket-outlets.....:		N
6.6	**Safeguards against fire due to the connection to additional equipment**		**N**
7	**INJURY CAUSED BY HAZARDOUS SUBSTANCES**		**P**
7.2	**Reduction of exposure to hazardous substances**		**N**
7.3	**Ozone exposure**		**N**
7.4	**Use of personal safeguards or personal protective equipment (PPE)**		**N**
	Personal safeguards and instructions.....:		—
7.5	**Use of instructional safeguards and instructions**		**N**
	Instructional safeguard (ISO 7010).....:		—
8	**MECHANICALLY-CAUSED INJURY**		**P**
8.2	**Mechanical energy source classifications**		**P**
8.3	**Safeguards against mechanical energy sources**		**N**
8.4	**Safeguards against parts with sharp edges and corners**		**N**
8.4.1	Requirements		N
	Instructional Safeguard ..... :	MS1 classification, no safeguard required	N
8.4.2	Compliance criteria		N
8.5	**Safeguards against moving parts**		**N**
8.5.1	Requirements		N
	Fingers, jewellery, clothing, hair, etc., contact with MS2 or MS3 parts		N
	MS2 or MS3 part required to be accessible for the function of the equipment		N
	A manually activated stopping device for moving MS3		N

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Clause	Requirement + Test	Result - Remark	Verdict
	Moving MS3 parts only accessible to skilled person		N
8.5.2	Instructional safeguard ..... :		N
8.5.4	Special categories of equipment containing moving parts		N
8.5.4.1	General		N
8.5.4.2	Equipment containing work cells with MS3 parts		N
8.5.4.2.1	Protection of persons in the work cell		N
8.5.4.2.2	Access protection override		N
8.5.4.2.2.1	Override system		N
8.5.4.2.2.2	Visual indicator		N
8.5.4.2.3	Emergency stop system		N
	Maximum stopping distance from the point of activation (m) ..... :		N
	Space between end point and nearest fixed mechanical part (mm)..... :		N
8.5.4.2.4	Endurance requirements		N
	Mechanical system subjected to 100 000 cycles of operation		N
	- Mechanical function check and visual inspection		N
	- Cable assembly..... :		N
8.5.4.3	Equipment having electromechanical device for destruction of media		N
8.5.4.3.1	Equipment safeguards		N
8.5.4.3.2	Instructional safeguards against moving parts ..... :		N
8.5.4.3.3	Disconnection from the supply		N
8.5.4.3.4	Cut type and test force (N) ..... :		N
8.5.4.3.5	Compliance		N
8.5.5	High pressure lamps		N
	Explosion test ..... :		N
8.5.5.3	Glass particles dimensions (mm)..... :		N
8.6	**Stability of equipment**		**N**
8.6.1	Requirements		N
	Instructional safeguard for MS2 and MS3 television sets..... :		N
8.6.2	Static stability		N
8.6.2.2	Static stability test ..... :		N

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Clause	Requirement + Test	Result - Remark	Verdict
8.6.2.3	Downward force test		N
8.6.3	Relocation stability		N
	Wheels diameter (mm) ..... :		—
	Tilt test		N
8.6.4	Glass slide test		N
8.6.5	Horizontal force test..... :		N
8.7	**Equipment mounted to wall, ceiling or other structure**		**N**
8.7.1	Requirements		N
	Mount means type ..... :		N
8.7.2	Test methods		N
	Test 1, additional downwards force (N) ..... :		N
	Horizontal force to a wall or another structure		N
	Test 2, number of attachment points and test force (N) ..... :		N
	Test 3, nominal diameter (mm) and applied torque (Nm) ..... :		N
8.8	**Handles strength**		**P**
8.8.1	General	MS1 equipment with single handle	P
8.8.2	Handle strength test	No need to tested for above reason.	N
	Number of handles ..... :		—
	Weight applied (kg)..... :		—
8.9	**Wheels or casters attachment requirements**		**N**
8.9.2	Pull test		N
8.10	**Carts, stands and similar carriers**		**N**
8.10.1	General		N
8.10.2	Marking and instructions ..... :		N
8.10.3	Cart, stand or carrier loading test		N
	Loading force applied (N) ..... :		N
8.10.4	Cart, stand or carrier impact test	(See Clause T.6)	N
	Loading force applied (N) on each supporting surface ..... :		N
8.10.5	Mechanical stability		N
	Force applied (N) ..... :		N
8.10.6	Thermoplastic temperature stability	(See Clause T.8)	N

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EN IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
8.11	**Mounting means for slide-rail mounted equipment (SRME)**		**N**
8.11.1	General		N
8.11.2	Requirements		N
	Instructional Safeguard ..... :		N
8.11.3	Mechanical strength test		N
8.11.3.1	Downward force test, force applied (N) ..... :		N
8.11.3.2	Lateral push force test		N
8.11.3.3	Integrity of slide rail end stops		N
8.11.4	Compliance criteria		N
8.12	**Telescoping or rod antennas**		**N**
	No sharp edges or points		N
	Button/ball diameter (mm)..... :		N
9	**THERMAL BURN INJURY**		**P**
9.2	**Thermal energy source classifications**		**P**
9.3	**Touch temperature limits**		**P**
9.3.1	Touch temperatures of accessible parts..... :	(See appended table 5.4.1.4, 9.3, B.1.5, B.2.6)	P
9.3.2	Test method and compliance		P
9.4	**Safeguards against thermal energy sources**		**P**
9.5	**Requirements for safeguards**		**P**
9.5.1	Equipment safeguard		P
9.5.2	Instructional safeguard ..... :		N
9.6	**Requirements for wireless power transmitters**		**N**
9.6.1	General		N
9.6.2	Specification of the foreign objects		N
9.6.3	Test method and compliance criteria..... :	(See appended table 9.6)	N
10	**RADIATION**		**P**
10.2	**Radiation energy source classifications**		**P**
10.2.1	General classification	Exempt group	P
	Lasers ..... :		—
	Lamps and lamp systems ..... :	Indicator LED	—
	Image projectors ..... :		—
	X-Ray ..... :		—
	Personal music player..... :		—

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Clause	Requirement + Test	Result - Remark	Verdict
10.3	**Safeguards against laser radiation**		**N**
	The standard(s) equipment containing laser(s) comply ..... :		N
10.4	**Safeguards against optical radiation from lamps and lamp systems (including LED types)**		**P**
10.4.1	General requirements	Exempt group: LED only for indicating use which is considered as low power application.	P
	Instructional safeguard provided for accessible radiation level needs to exceed		N
	Risk group marking and location..... :		N
	Information for safe operation and installation		N
10.4.2	Requirements for equipment safeguards		N
	UV radiation exposure..... :	(See Annex C)	N
10.4.3	Instructional safeguard..... :		N
10.5	**Safeguards against X-radiation**		**N**
10.5.1	Requirements		N
	Instructional safeguard for skilled persons ..... :		N
10.5.3	Maximum radiation (pA/kg)..... :	(See appended tables B.3 & B.4)	N
10.6	**Safeguards against acoustic energy sources**		**N**
10.6.1	General		N
10.6.2	Classification		N
	Acoustic output $L_{Aeq,T}$, dB(A) ..... :		N
	Unweighted RMS output voltage (mV) ..... :		N
	Digital output signal (dBFS) ..... :		N
10.6.3	Requirements for dose-based systems		N
10.6.3.1	General requirements		N
10.6.3.2	Dose-based warning and automatic decrease		N
10.6.3.3	Exposure-based warning and requirements		N
	30 s integrated exposure level (MEL30)..... :		N
	Warning for MEL ≥ 100 dB(A)..... :		N
10.6.4	Measurement methods		N
10.6.5	Protection of persons		N
	Instructional safeguards..... :		N
10.6.6	Requirements for listening devices (headphones, earphones, etc.)		N

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Clause	Requirement + Test	Result - Remark	Verdict
10.6.6.1	Corded listening devices with analogue input		N
	Listening device input voltage (mV) ..... :		N
10.6.6.2	Corded listening devices with digital input		N
	Max. acoustic output $L_{Aeq,T}$, dB(A)..... :		N
10.6.6.3	Cordless listening devices		N
	Max. acoustic output $L_{Aeq,T}$, dB(A)..... :		N

EN IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
B	**NORMAL OPERATING CONDITION TESTS, ABNORMAL OPERATING CONDITION TESTS AND SINGLE FAULT CONDITION TESTS**		**P**
B.1	**General**		**P**
B.1.5	Temperature measurement conditions	(See appended table 5.4.1.4, 9.3, B.1.5, B.2.6)	P
B.1.6	Specific output conditions		N
B.2	**Normal operating conditions**		**P**
B.2.1	General requirements ..... :	(See Test Item Particulars and appended test tables)	P
	Audio Amplifiers and equipment containing an audio amplifiers..... :	Test according to requirements of annex E	P
B.2.3	Supply voltage and tolerances		N
B.2.5	Input test ..... :	(See appended table B.2.5)	P
B.2.6.4	Equipment intended for building-in or rack-mounting		N
B.3	**Simulated abnormal operating conditions**		**P**
B.3.1	General	(See appended table B.3&B.4)	P
B.3.2	Covering of ventilation openings	No ventilation openings	N
	Instructional safeguard..... :		N
B.3.3	DC mains polarity test	No DC mains	N
B.3.4	Setting of voltage selector	No such device.	N
B.3.5	Maximum load at output terminals		N
B.3.6	Reverse battery polarity	(See appended table B.3&B.4)	N
B.3.7	Audio amplifier abnormal operating conditions		P
B.3.8	Safeguards functional during and after abnormal operating conditions..... :	All safety protection is still effective	P
B.4	**Simulated single fault conditions**		**P**
B.4.1	General		P

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Clause	Requirement + Test	Result - Remark	Verdict
B.4.2	Temperature controlling device		N
B.4.3	Blocked motor test		N
B.4.4	Functional insulation	See the following details.	P
B.4.4.1	Short circuit of clearances for functional insulation	(See appended table B.3 &B.4)	P
B.4.4.2	Short circuit of creepage distances for functional insulation	(See appended table B.3 &B.4)	P
B.4.4.3	Short circuit of functional insulation on coated printed boards	No coated printed boards within the EUT	N
B.4.5	Short-circuit and interruption of electrodes in tubes and semiconductors	(See appended table B.3 &B.4)	P
B.4.6	Short circuit or disconnection of passive components	(See appended table B.3 &B.4)	P
B.4.7	Continuous operation of components	The EUT is continuous operating type and no such components intended for short time operation or intermittent operation	N
B.4.8	Compliance criteria during and after single fault conditions ..... :	(See appended table B.3&B.4)	P
B.4.9	Battery charging and discharging under single fault conditions	(See Annex M)	P
C	**UV RADIATION**		**N**
C.1	**Protection of materials in equipment from UV radiation**		**N**
C.1.2	Requirements	No UV radiation in the equipment	N
C.1.3	Test method and compliance criteria		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 test		N
C.2.4	Xenon-arc light-exposure test		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 INTENDED TO AMPLIFY AUDIO SIGNALS**		**P**
E.1	**Electrical energy source classification for audio signals**		**P**
	Maximum non-clipped output power (W) ..... :		—
	Rated load impedance (Ω) ..... :		—

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EN IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Open-circuit output voltage (V) ..... :		—
	Instructional safeguard..... :		—
E.2	**Audio signals used during test**		**P**
E.2.1	Pink noise test signal		N
E.2.2	Sine-wave signal		P
E.3	**Operating conditions of equipment containing an audio amplifier**		**P**
E.3.1	Normal operating conditions		P
E.3.2	Abnormal operating conditions	(See appended table B.3&B.4)	P
E.3.3	Audio equipment temperature measurement conditions ..... :		P
F	**EQUIPMENT MARKINGS, INSTRUCTIONS, AND INSTRUCTIONAL SAFEGUARDS**		**P**
F.1	**General**		**P**
	Language ..... :	Only english version review. Versions in other language will be provided when submitted for national approval.	—
F.2	**Letter symbols and graphical symbols**		**P**
F.2.1	Letter symbols according to IEC 60027-1	Letter symbols for quantities and units are complied with IEC 60027-1.	P
F.2.2	Graphic symbols according to IEC, ISO or manufacturer specific	Graphical symbols are complied with IEC 60417, ISO 3864-2, ISO 7000 or ISO 7010.	P
F.3	**Equipment markings**		**P**
F.3.1	Equipment marking locations	Equipment marking is located on the exterior surface and is easily visible.	P
F.3.2	Equipment identification markings	See the following details.	P
F.3.2.1	Manufacturer identification..... :	See copy of marking plate.	—
F.3.2.2	Model identification ..... :	See copy of marking plate.	—
F.3.3	Equipment rating markings	See the following details.	P
F.3.3.1	Equipment with direct connection to mains		N
F.3.3.2	Equipment without direct connection to mains	See above.	P
F.3.3.3	Nature of the supply voltage ..... :	See copy of marking plate.	P
F.3.3.4	Rated voltage..... :	See copy of marking plate.	P
F.3.3.5	Rated frequency..... :		N
F.3.3.6	Rated current or rated power..... :	See copy of marking plate.	P

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EN IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
F.3.3.7	Equipment with multiple supply connections		N
F.3.4	Voltage setting device	No such device	N
F.3.5	Markings on terminals and operating devices	See below	N
F.3.5.1	Mains appliance outlet and socket-outlet markings:	No such devices on the equipment.	N
F.3.5.2	Switch position identification marking.....:	No such switch on the equipment.	N
F.3.5.3	Replacement fuse identification and rating markings .....:		N
	Instructional safeguards for neutral fuse.....:		N
F.3.5.4	Replacement battery identification marking.....:		N
F.3.5.5	Neutral conductor terminal		N
F.3.5.6	Terminal marking location		N
F.3.6	Equipment markings related to equipment classification		N
F.3.6.1	Class I equipment		N
F.3.6.1.1	Protective earthing conductor terminal .....:		N
F.3.6.1.2	Protective bonding conductor terminals.....:		N
F.3.6.2	Equipment class marking.....:		N
F.3.6.3	Functional earthing terminal marking.....:		N
F.3.7	Equipment IP rating marking.....:	This equipment is classified as IPX0.	N
F.3.8	External power supply unit output marking.....:		N
F.3.9	Durability, legibility and permanence of markings	See the following details.	P
F.3.10	Test for permanence of markings	The label was subjected to the permanence of marking test, 15 sec. for water and 15 sec. for petroleum spirit. After each test, the marking remained legible.	P
F.4	**Instructions**		**P**
	– Information prior to installation and initial use	Relevant safety caution texts and installation instruction are available.	P
	– Equipment for use in locations where children not likely to be present		N
	– Instructions for installation and interconnection		P
	– Equipment intended for use only in restricted access area		N
	– Equipment intended to be fastened in place		N

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Clause	Requirement + Test	Result - Remark	Verdict
	– Instructions for audio equipment terminals		N
	– Protective earthing used as a safeguard		N
	– Protective conductor current exceeding ES2 limits		N
	– Graphic symbols used on equipment		N
	– Permanently connected equipment not provided with all-pole mains switch		N
	– Replaceable components or modules providing safeguard function		N
	– Equipment containing insulating liquid		N
	– Installation instructions for outdoor equipment		N
F.5	Instructional safeguards		**P**
G	**COMPONENTS**		**P**
G.1	**Switches**		**N**
G.1.1	General		N
G.1.2	Ratings, endurance, spacing, maximum load		N
G.1.3	Test method and compliance criteria		N
G.2	**Relays**		**N**
G.2.1	Requirements and compliance criteria		N
G.2.2	Overload test		N
G.2.3	Relay controlling connectors supplying power to other equipment		N
G.2.4	Test method and compliance criteria		N
G.3	**Protective devices**		**N**
G.3.1	Thermal cut-offs	No such device	N
	Thermal cut-outs separately approved according to IEC 60730-1 with conditions indicated in a) & b)	No thermal cut-off provided within the equipment.	N
	Thermal cut-outs tested as part of the equipment as indicated in c)	See above.	N
G.3.1.2	Test method and compliance criteria		N
G.3.2	Thermal links		N
G.3.2.1	a) Thermal links tested separately according to IEC 60691 with specifics		N
	b) Thermal links tested as part of the equipment		N
G.3.2.2	Test method and compliance criteria		N
G.3.3	PTC thermistors	No such device	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.3.4		N
G.3.5.1	Non-resettable devices suitably rated and marking provided		N
G.3.5.2	Single faults conditions .....:		N
G.4	**Connectors**		**N**
G.4.1	Spacings	No such connector within the EUT	N
G.4.2	Mains connectors 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	No such component.	N
G.5.1.2	Protection against mechanical stress		N
G.5.2	Endurance test		N
G.5.2.1	General test requirements		N
G.5.2.2	Heat run test		N
	Test time (days per cycle).....:		—
	Test temperature (°C) .....:		—
G.5.2.3	Wound components supplied from the mains		N
G.5.2.4	Compliance criteria		N
G.5.3	Transformers		N
G.5.3.1	General		N
	Compliance method .....:		N
G.5.3.2	Insulation		N
	Protection from displacement of windings .....:		—
G.5.3.3	Transformer overload tests		N
G.5.3.3.1	Test conditions		N
	Position .....:		N
	Method of protection .....:		N
G.5.3.3.2	Winding temperatures		N
G.5.3.3.3	Winding temperatures - alternative test method		N
G.5.3.4	Transformers using FIW		N
G.5.3.4.1	General		N

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Clause	Requirement + Test	Result - Remark	Verdict
	FIW wire nominal diameter ..... :		—
G.5.3.4.2	Transformers with basic insulation only		N
G.5.3.4.3	Transformers with double insulation or reinforced insulation ..... :		N
G.5.3.4.4	Transformers with FIW wound on metal or ferrite core		N
G.5.3.4.5	Thermal cycling test and compliance		N
G.5.3.4.6	Partial discharge test		N
G.5.4	Motors		N
G.5.4.1	General requirements		N
G.5.4.2	Motor overload test conditions		N
G.5.4.3	Running overload test		N
G.5.4.4	Locked-rotor overload test		N
	Test duration (days) ..... :		—
	Electric strength test ..... :		N
G.5.4.5	Running overload test for DC motors		N
G.5.4.5.2	Tested in the unit		N
	Electric strength test ..... :		N
G.5.4.5.3	Alternative method		N
	Electric strength test ..... :		N
G.5.4.6	Locked-rotor overload test for DC motors		N
G.5.4.6.2	Tested in the unit		N
	Maximum Temperature (°C) ..... :		N
	Electric strength test ..... :		N
G.5.4.6.3	Alternative method		N
	Electric strength test ..... :		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 (V) ..... :		—
G.6	**Wire Insulation**		**N**
G.6.1	General	No such device	N
G.6.2	Enamelled winding wire insulation		N
G.7	**Mains power supply cords and interconnection cables**		**N**

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Clause	Requirement + Test	Result - Remark	Verdict
G.7.1	General requirements	No such device	N
	Type .....:		—
G.7.2	Cross sectional area (mm^2 or AWG).....:		N
G.7.3	Cord anchorages and strain relief		N
G.7.3.2	Cord strain relief		N
G.7.3.2.1	Requirements		N
	Strain relief test force (N).....:		N
G.7.3.2.2	Strain relief mechanism failure		N
G.7.3.2.3	Cord sheath or jacket position, distance (mm) .....:		N
G.7.3.2.4	Strain relief and cord anchorage material		N
G.7.4	Cord Entry		N
G.7.5	Non-detachable cord bend protection		N
G.7.5.1	Requirements		N
G.7.5.2	Test method and compliance criteria		N
	Overall diameter or minor overall dimension, *D* (mm) .....:		—
	Radius of curvature after test (mm) .....:		—
G.7.6	Supply wiring space		N
G.7.6.1	General requirements		N
G.7.6.2	Stranded wire		N
G.7.6.2.1	Requirements		N
G.7.6.2.2	Test with 8 mm strand		N
G.8	**Varistors**		**N**
G.8.1	General requirements	No such device	N
G.8.2	Safeguards against fire		N
G.8.2.1	General		N
G.8.2.2	Varistor overload test		N
G.8.2.3	Temporary overvoltage test		N
G.9	**Integrated circuit (IC) current limiters**		**N**
G.9.1	Requirements	No such device	N
	IC limiter output current (max. 5A).....:		—
	Manufacturers' defined drift .....:		—
G.9.2	Test Program		N
G.9.3	Compliance criteria		N

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Clause	Requirement + Test	Result - Remark	Verdict
G.10	**Resistors**		**N**
G.10.1	General	No such device	N
G.10.2	Conditioning		N
G.10.3	Resistor test		N
	Changes of resistance (%).....:		N
	Measured current with the lowest resistance value:		N
G.10.4	Voltage surge test		N
	Changes of resistance (%).....:		N
G.10.5	Impulse test		N
	Changes of resistance (%).....:		N
G.10.6	Overload test		N
	Changes of resistance (%).....:		N
G.11	**Capacitors and RC units**		**N**
G.11.1	General requirements	No such device	N
G.11.2	Conditioning of capacitors and RC units		N
G.11.3	Rules for selecting capacitors		N
G.12	**Optocouplers**		**N**
	Optocouplers comply with IEC 60747-5-5 with specifics	No such device	N
	Type test voltage $V_{ini,a}$.....:		—
	Routine test voltage, $V_{ini,b}$.....:		—
G.13	**Printed boards**		**P**
G.13.1	General requirements	See the following details.	P
G.13.2	Uncoated printed boards	The insulation between conductors on the outer surfaces of an uncoated printed board complied with the minimum clearance and creepage requirements	P
G.13.3	Coated printed boards		N
G.13.4	Insulation between conductors on the same inner surface		N
G.13.5	Insulation between conductors on different surfaces		N
	Distance through insulation.....:		N
	Number of insulation layers (pcs) .....:		—
G.13.6	Tests on coated printed boards		N

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Clause	Requirement + Test	Result - Remark	Verdict
G.13.6.1	Sample preparation and preliminary inspection		N
G.13.6.2	Test method and compliance criteria		N
G.14	**Coating on components terminals**		**N**
G.14.1	Requirements.....:	(See Clause G.13)	N
G.15	**Pressurized liquid filled components or LFC assemblies**		**N**
G.15.1	Requirements		N
G.15.2	Test methods and compliance criteria for self-contained LFC		N
G.15.2.1	Hydrostatic pressure test, applied test pressure.....:		N
G.15.2.2	Creep resistance test		N
G.15.2.3	Tubing and fittings compatibility test, the change of tensile strength (%) .....:		N
G.15.2.4	Vibration test		N
G.15.2.5	Thermal cycling test, test temperature (°C) .....:		N
G.15.2.6	Force test		N
G.15.2.7	Compliance criteria		N
G.15.3	Test methods and compliance for a modular LFC		N
G.15.3.2	Hydrostatic pressure test, applied test pressure.....:		N
G.15.3.3	Creep resistance test		N
G.15.3.4	Tubing and fittings compatibility test, the change of tensile strength (%) .....:		N
G.15.3.5	Thermal cycle test, test temperature (°C) .....:		N
G.15.3.6	Force test		N
G.15.3.7	Compliance criteria		N
G.16	**IC including capacitor discharge function (ICX)**		**N**
G.16.1	Condition for fault tested is not required		N
	ICX with associated circuitry tested in equipment		N
	ICX tested separately		N
G.16.2	Tests		N
	Smallest capacitance and smallest resistance specified by ICX manufacturer for impulse test .....:		—
	Mains voltage that impulses to be superimposed on .....:		—
	Largest capacitance and smallest resistance for ICX tested by itself for 10000 cycles test.....:		—

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Clause	Requirement + Test	Result - Remark	Verdict
G.16.3	Capacitor discharge test ..... :	(See appended table 5.5.2.2)	N
H	**CRITERIA FOR TELEPHONE RINGING SIGNALS**		**N**
H.1	**General**		**N**
H.2	**Method A**		**N**
H.3	**Method B**		**N**
H.3.1	Ringing 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 condition 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		N
H.3.2.2	Tripping device		N
H.3.2.3	Monitoring voltage (V)..... :		N
J	**INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION**		**N**
J.1	**General**		**N**
	Winding wire insulation ..... :		—
	Solid round winding wire, diameter (mm) ..... :		N
	Solid square and rectangular (flatwise bending) winding wire, cross-sectional area (mm^2) ..... :		N
J.2/J.3	Tests and Manufacturing	(See separate test report)	—
K	**SAFETY INTERLOCKS**		**N**
K.1	**General requirements**		**N**
	Instructional safeguard..... :		N
K.2	**Components of safety interlock safeguard mechanism**		**N**
K.3	**Inadvertent change of operating mode**		**N**
K.4	**Interlock safeguard override**		**N**
K.5	**Fail-safe**		**N**
K.5.1	Under single fault condition		N
K.6	**Mechanically operated safety interlocks**		**N**
K.6.1	Endurance requirement		N
K.7	**Interlock circuit isolation**		**N**

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Clause	Requirement + Test	Result - Remark	Verdict
K.7.1	Separation distance for contact gaps & interlock circuit elements		N
	In circuit connected to mains, separation distance for contact gaps (mm) .....:		N
	In circuit isolated from mains, separation distance for contact gaps (mm) .....:		N
	Electric strength test before and after the test of K.7.2.....:	(See appended table 5.4.9)	N
K.7.2	Overload test, Current (A).....:		N
K.7.3	Endurance test		N
K.7.4	Electric strength test	(See appended table 5.4.9)	N
L	**DISCONNECT DEVICES**		**N**
L.1	**General requirements**		**N**
L.2	**Permanently connected equipment**		**N**
	Instructions for permanently connected equipment		N
L.3	**Parts that remain energized**		**N**
L.4	**Single-phase equipment**		**N**
	Instructions for single pole disconnect device		N
L.5	**Three-phase equipment**		**N**
L.6	**Switches as disconnect devices**		**N**
L.7	**Plugs as disconnect devices**		**N**
	Instructions for pluggable equipment		—
L.8	**Multiple power sources**		**N**
	Instructional safeguard.....:		N
M	**EQUIPMENT CONTAINING BATTERIES AND THEIR PROTECTION CIRCUITS**		**P**
M.1	**General requirements**		**P**
M.2	**Safety of batteries and their cells**		**P**
M.2.1	Batteries and their cells comply with relevant IEC standards .....:		P
M.3	**Protection circuits for batteries provided within the equipment**		**P**
M.3.1	Requirements		P
M.3.2	Test method		P
	Overcharging of a rechargeable battery		P
	Excessive discharging		P
	Unintentional charging of a non-rechargeable battery		N

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EN IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Reverse charging of a rechargeable battery		N
M.3.3	Compliance criteria	No chemical leakage, no liquid spillage, no explosion, no emission of flame or expulsion of molten metal	P
M.4	**Additional safeguards for equipment containing a secondary lithium battery**		**P**
M.4.1	General		P
	IEC 62133-2 batteries used for sub-system power powering application .....:		P
M.4.2	Charging safeguards		P
M.4.2.1	Requirements		P
M.4.2.2	Test		P
M.4.2.2.1	General		P
M.4.2.2.2	Abnormal operating conditions		P
M.4.2.2.3	Single fault conditions		P
M.4.2.3	Compliance criteria .....:	(See appended table M.4.2)	P
M.4.3	Fire enclosure .....:		P
M.4.4	Drop test of equipment containing a secondary lithium battery		P
M.4.4.2	Preparation and procedure for the drop test		P
M.4.4.3	Drop, Voltage on reference and dropped batteries (V); voltage difference during 24 h period (%) .....:	After test, Voltage difference less than 5% in 24H	P
M.4.4.4	Check of the charge/discharge function		P
M.4.4.5	Charge / discharge cycle test	No fire, no explosion, and no hazards produced during tests.	P
M.4.4.6	Compliance criteria		P
M.5	**Risk of burn due to short-circuit during carrying**		**P**
M.5.1	Requirement	Built in battery	P
M.5.2	Test method and compliance criteria		N
M.6	**Safeguards against short-circuits**		**P**
M.6.1	External and internal faults	Complied with IEC 62133-2. No such explosion or fire likely to result from short circuits.	P
M.6.2	Compliance criteria		N
M.7	**Risk of explosion from lead acid and NiCd batteries**		**N**
M.7.1	Ventilation preventing explosive gas concentration		N
	Calculated hydrogen generation rate.....:		N

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EN IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
M.7.2	Test method and compliance criteria		N
	Minimum air flow rate, *Q* (m^3/h) ..... :		N
M.7.3	Ventilation tests		N
M.7.3.1	General		N
M.7.3.2	Ventilation test – alternative 1		N
	Hydrogen gas concentration (%) ..... :		N
M.7.3.3	Ventilation test – alternative 2		N
	Obtained hydrogen generation rate ..... :		N
M.7.3.4	Ventilation test – alternative 3		N
	Hydrogen gas concentration (%) ..... :		N
M.7.4	Marking ..... :		N
M.8	**Protection against internal ignition from external spark sources of rechargeable batteries with aqueous electrolyte**		**N**
M.8.1	General		N
M.8.2	Test method		N
M.8.2.1	General		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**		**P**
	Instructional safeguard..... :	Mention in user manual.	P
N	**ELECTROCHEMICAL POTENTIALS**		**N**
	Material(s) used ..... :		—
O	**MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES**		**N**
	Value of *X* (mm) ..... :		—
P	**SAFEGUARDS AGAINST CONDUCTIVE OBJECTS**		**N**
P.1	**General**		**N**
P.2	**Safeguards against entry or consequences of entry of a foreign object**		**N**
P.2.1	General		N
	Location and Dimensions (mm) ..... :		—

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EN IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
P.2.2	Safeguard requirements		N
	The ES3 and PS3 keep-out volume in Figure P.4 not applicable to transportable equipment		N
	Transportable equipment with metalized plastic parts .....:		N
P.2.3	Consequence of entry test .....:		N
P.3	**Safeguards against spillage of internal liquids**		**N**
P.3.1	General		N
P.3.2	Determination of spillage consequences		N
P.3.3	Spillage safeguards		N
P.3.4	Compliance criteria		N
P.4	**Metallized coatings and adhesives securing parts**		**N**
P.4.1	General		N
P.4.2	Tests		N
	Conditioning, T_C (°C).....:		—
	Duration (weeks).....:		—
Q	**CIRCUITS INTENDED FOR INTERCONNECTION WITH BUILDING WIRING**		**N**
Q.1	**Limited power sources**		**N**
Q.1.1	Requirements		N
	a) Inherently limited output		N
	b) Impedance limited output		N
	c) Regulating network limited output	(See appended table Q.1)	N
	d) Overcurrent protective device limited output		N
	e) IC current limiter complying with G.9		N
Q.1.2	Test method and compliance criteria.....:	(See appended table Q.1)	N
	Current rating of overcurrent protective device (A)		N
Q.2	**Test for external circuits – paired conductor cable**		**N**
	Maximum output current (A) .....:		N
	Current limiting method.....:		—
R	**LIMITED SHORT CIRCUIT TEST**		**N**
R.1	**General**		**N**
R.2	**Test setup**		**N**
	Overcurrent protective device for test.....:		—
R.3	**Test method**		**N**

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EN IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Cord/cable used for test.....:		—
R.4	**Compliance criteria**		**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).....:		—
	- Material did not show any additional holes for combustible materials		N
	- Cheesecloth did not ignite for top openings		N
S.3	**Flammability test for the bottom of a fire enclosure**		**N**
S.3.1	Mounting of samples		N
S.3.2	Test method and compliance criteria		N
	Mounting of samples.....:		—
	Wall thickness (mm).....:		—
	Cheesecloth did not ignite		N
S.4	**Flammability classification of materials**		**N**
S.5	**Flammability test for fire enclosure materials of equipment with a steady state power exceeding 4 000 W**		**N**
	Samples, material .....:		—
	Wall thickness (mm).....:		—
	Conditioning (°C).....:		—
S.6	**Grille covering material, cloth, and reticulated foam**		**N**
	Samples, material .....:		—

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EN IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Measured distance from the centre of the fuel tablet (mm)..... :		N
T	**MECHANICAL STRENGTH TESTS**		**P**
T.1	**General**		**P**
T.2	**Steady force test, 10 N**..... :		**N**
T.3	**Steady force test, 30 N**..... :		**N**
T.4	**Steady force test, 100 N**..... :	(See appended table T.4)	**P**
T.5	**Steady force test, 250 N**..... :		**N**
T.6	**Enclosure impact test**		**N**
	Fall test		N
	Swing test		N
T.7	**Drop test**..... :	(See appended table T.7)	**P**
T.8	**Stress relief test**..... :	(See appended table T.8)	**P**
T.9	**Glass Impact Test**..... :		**N**
T.10	**Glass fragmentation test**		**N**
	Number of particles counted ..... :		N
T.11	**Test for telescoping or rod antennas**		**N**
	Torque value (Nm)..... :		N
U	**MECHANICAL STRENGTH OF CATHODE RAY TUBES (CRT) AND PROTECTION AGAINST THE EFFECTS OF IMPLOSION**		**N**
U.1	**General**		**N**
	Instructional safeguard ..... :		N
U.2	**Test method and compliance for non-intrinsically protected CRTs**		**N**
U.3	**Protective screen**		**N**
V	**DETERMINATION OF ACCESSIBLE PARTS**		**N**
V.1	**Accessible parts of equipment**		**N**
V.1.1	General		N
V.1.2	Surfaces and openings tested with jointed test probes		N
V.1.3	Openings tested with straight unjointed test probes		N
V.1.4	Plugs, jacks, connectors tested with blunt probe		N
V.1.5	Slot openings tested with wedge probe		N
V.1.6	Terminals tested with rigid test wire		N
V.2	**Accessible part criterion**		**N**

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EN IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
X	**ALTERNATIVE METHOD FOR DETERMINING CLEARANCES FOR INSULATION IN CIRCUITS CONNECTED TO AN AC MAINS NOT EXCEEDING 420 V PEAK (300 V RMS)**		**N**
	Clearance..... :	(See appended table X)	N
Y	**CONSTRUCTION REQUIREMENTS FOR OUTDOOR ENCLOSURES**		**N**
Y.1	**General**	For indoor used only	**N**
Y.2	**Resistance to UV radiation**		**N**
Y.3	**Resistance to corrosion**		**N**
Y.3.1	Metallic parts of outdoor enclosures are resistant to effects of water-borne contaminants by..... :		N
Y.3.2	Test apparatus		N
Y.3.3	Water – saturated sulphur dioxide atmosphere		N
Y.3.4	Test procedure ..... :		N
Y.3.5	Compliance criteria		N
Y.4	**Gaskets**		**N**
Y.4.1	General		N
Y.4.2	Gasket tests		N
Y.4.3	Tensile strength and elongation tests, changes of tensile strength and elongation ..... :		N
	Alternative test methods ..... :		N
Y.4.4	Compression test		N
Y.4.5	Oil resistance, change of swell / shrink (%)..... :		N
Y.4.6	Securing means	(See Clause P.4)	N
Y.5	**Protection of equipment within an outdoor enclosure**		**N**
Y.5.1	General		N
Y.5.2	Protection from moisture		N
	Relevant tests of IEC 60529 or Y.5.3 ..... :		N
Y.5.3	Water spray test		N
Y.5.4	Protection from plants and vermin		N
Y.5.5	Protection from excessive dust		N
Y.5.5.1	General		N
	Relevant tests of IEC 60529 or Y.5.5.2 or Y.5.5.3.. :		N
Y.5.5.2	IP5X equipment		N
Y.5.5.3	IP6X equipment		N
Y.6	**Mechanical strength of enclosures**		**N**

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EN IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
Y.6.1	General		N
Y.6.2	Impact test .....:	(See appended table T.6, T.9)	N

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EN IEC62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
ATTACHMENT TO TEST REPORT **IEC 62368-1** **EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES** (Audio/video, information and communication technology equipment Part 1: Safety requirements)			
Differences according to.....: EN IEC 62368-1-2024 + A11:2024			
	CENELEC COMMON MODIFICATIONS (EN)		P
	Clause numbers in the cells that are shaded light grey are clause references in EN IEC 62368-1:2024+A11:2024. All other clause numbers in that column, except for those in the paragraph below, refers to IEC 62368-1:2023. Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 62368-1:2023 are prefixed “Z”.		P
	Add the following annexes: Annex ZA (normative) Normative references to international publications with their corresponding European publications Annex ZB (normative) Special national conditions Annex ZC (informative) A-deviations Annex ZD (informative) IEC and CENELEC code designations for flexible cords		P
1	**MODIFICATION to the whole document**		--
	Delete all the “country” notes in the reference document according to the following list:		P

0.2.1	Note 1 and Note 2		1	Note 4 and Note 5		3.3.8.1	Note 2
3.3.8.3	Note 1		4.1.15	Note		4.7.3	Note 1 and Note 2
5.4.2.3.2.2 Table 12	Note c		5.4.2.3.2.4	Note 1 and Note 3		5.4.2.3.2.4 Table 13	Note 2
5.4.2.5	Note 2		5.4.5.1	Note		5.4.10.2.1	Note
5.4.10.2.2	Note		5.4.10.2.3	Note			
5.5.2.1	Note		5.5.6	Note		5.6.4.2.1	Note 2 and Note 3 and Note 4
5.6.8	Note 2		5.7.7.1	Note 1 and Note 2		8.5.4.2.3	Note
10.2.1 Table 39	Note 3 and Note 4 and Note 5		10.5.3	Note 2		10.6.1	Note 3
F.3.3.4	Note 2		F.3.3.6	Note 3		Y.4.1	Note
Y.4.5	Note						

2	**Modification to Clause 1**	--

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EN IEC62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
1	**Add** the following note at the end of Clause 1: “NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2011/65/EU.” **Add** the following paragraph and note after Note 5: “This document is a type test standard. NOTE Z2 **Routine tests** of complete equipment, sub-assemblies or components are covered by EN 62911.”		P
3	**Modification to Clause 2**		--
2	***Add*** *the following references:* *EN 71-1:2014+A1:2018, Safety of toys - Part 1: Mechanical and physical properties* *EN 50332-1:2013, Sound system equipment: Headphones and earphones associated with personal music players - Maximum sound pressure level measurement methodology - Part 1: General method for "one package equipment"* *EN 50332-2:2013, Sound system equipment: Headphones and earphones associated with personal music players - Maximum sound pressure level measurement methodology - Part 2: Matching of sets with headphones if either or both are offered separately, or are offered as one package equipment but with standardised connectors between the two allowing to combine components of different manufacturers or different design* *EN 50332-3:2017, Sound system equipment: headphones and earphones associated with personal music players - Maximum sound pressure level measurement methodology - Part 3: Measurement method for sound dose management* *IEC/TR 62471-2, Photobiological safety of lamps and lamp systems - Part 2: Guidance on manufacturing requirements relating to non-laser optical radiation safety*		N
4	**Modification to Clause 4**		--

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EN IEC62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
4	**Add** the following new subclause 4.Z1 after subclause 4.9: “For compliance with B.3 and B.4 in circuits connected to an AC **mains**, protective **devices** shall be provided, subject to the following: - for **pluggable equipment type A**, the protective **devices** shall be included as parts of the equipment, with the exception of components in series with the **mains** input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, for which the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet;		N
	- for **pluggable equipment type B** or **permanently connected equipment**, the protection may be the dedicated overcurrent and short-circuit protection in the building installation, provided that the means of protection, for example a fuse or circuit breaker, is fully specified in the installation instructions. Where protective **devices** are required within the equipment, the protective **devices** within the equipment shall operate before or at the same time the expected building installation protection will operate. For earth faults in single-phase equipment, it is not necessary to provide 2 protective **devices**. It is expected that the building installation will protect against earth faults. This applies also in countries where an IT power distribution system is used.”		N
5	**Modification to subclause 4.1.9**		--
4.1.9	Add the following paragraph at the end of this subclause: “Products need to comply with the requirements of this document with appropriate measurement uncertainty. NOTE Z1 See also the RED ADCO position on ‘Measurement uncertainty in published harmonized standards’.		P
6	**Modification to subclause 5.4.9.1**		--
5.4.9.1	**Add** the following note after the 5th paragraph: “NOTE Z1 For guidance on the use of high voltage source, see IEC 60060-1, Clause 8 of IEC 60243-1 and IEC 61180.”		N

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EN IEC62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
7	**Modification to subclause 5.4.2.3.2.4**		--
5.4.2.3.2.4	**Add** the following at the end of this subclause: "The requirement for interconnection with **external circuit** in a HBES/BACS network is in addition given in EN IEC 63044-3:2018."		N
8	**Modification to subclause 5.6.6.2**		--
5.6.6.2	**Replace** item d) with the following: "d) For equipment powered from a DC mains, if the protective current rating of the circuit under test exceeds 25 A, the test current shall be minimum as required in item a), unless the manufacturer specifies a higher value."		N
9	**Modification to subclause 9.3.1**		--
9.3.1	**Replace** the second paragraph with the following: "An **accessible** part that, while in contact with the body, is likely to drop in temperature upon touch can be evaluated under the limits of Annex A of IEC Guide 117:2010 using the test method of 4.5 of IEC Guide 117."		N
10	**Modification to subclause 10.2.1**		--
10.2.1	**Add** the following to c) and d) in Table 38: "For additional requirements, see 10.5.1."		N
11	**Modification to subclause 10.4.1**		--

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EN IEC62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
10.4.1	**Replace** the second paragraph of 10.4.1 with: “Electronic light effect equipment does not have to comply with the requirements of 10.4. However, 114 IEC/TR 62471-2 shall be considered and proper installation instructions shall be provided. **Replace** the ninth paragraph of 10.4.1 with: The following information shall be provided in the user manual for safe operation and installation. This information shall also be provided for safe operation by a skilled person who may be exposed to Risk Group 3 energy levels. Adequate instructions for proper assembly, installation, maintenance and safe use, including clear warnings concerning precautions to avoid possible exposure to hazardous optical radiation; and Advice on safe operating procedures and warnings concerning **reasonably foreseeable misuse,** malfunctions and hazardous failure modes. Where servicing and maintenance procedures are detailed, they shall include explicit instructions on safe procedures to be followed; and The marking on the equipment shall be reproduced in the user manual. A yellow background is not required in the user manual.		N
12	**Modification to subclause 10.4.4**		--
10.4.4	**Replace** the last paragraph of 10.4.4 with: “Compliance against material degradation from UV radiation is checked by the applicable tests of Annex C.”		N
13	**Modification to subclause 10.5.1**		--

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EN IEC62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
10.5.1	**Add** the following after the first paragraph: “For RS1 compliance is checked by measurement under the following conditions: In addition to the **normal operating conditions**, all controls adjustable from the outside of the equipment by hand, by any object such as a **tool** or a coin, and those internal adjustments or pre-sets which are not locked in a reliable manner, are adjusted so as to give maximum radiation whilst maintaining an intelligible picture for 1 h, at the end of which the measurement is made. NOTE Z1 Soldered joints and paint lockings are examples of adequate locking. The dose-rate is determined by means of a radiation monitor with an effective area of 10 cm2, at any point at a distance of 10 cm from the outer surface of the equipment. Moreover, the measurement shall be made under fault conditions causing an increase of the high-voltage, provided an intelligible picture is maintained for 1 h, at the end of which the measurement is made. For RS1, the dose-rate shall not exceed 1 μSv/h taking account of the background level. NOTE Z2 These values appear in Directive 2013/59/Euratom of 5 December 2013.”		N
14	**Modification to subclause 10.5.3**		--
10.5.3	**Replace** the second paragraph of 10.5.3 with: “The amount of radiation is determined by means of a radiation monitor of the ionizing chamber type with an effective area of 1 000 mm2 ± 10 mm2 or by measuring equipment of other types giving equivalent results.”		N
15	**Modification to Clause 10**		--
	Replace 10.6 with the following:		N
10.6	**Safeguards against acoustic energy sources**		N
10.6.1	**General**		N

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EN IEC62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
10.6.1.1	**Introduction** **Safeguard** requirements for protection against long-term exposure to excessive sound pressure levels from personal music players closely coupled to the ear are specified below. Requirements for earphones and headphones intended for use with personal music players are also covered. A personal music player is a portable equipment intended for use by an **ordinary person**, that: - is designed to allow the user to listen to audio or audiovisual content / material; and - uses a listening **device**, such as headphones or earphones that can be worn in or on or around the ears; and - has a player that can be body worn (of a size suitable to be carried in a clothing pocket) and is intended for the user to walk around with while in continuous use (for example, on a street, in a subway, at an airport, etc.). EXAMPLES Portable CD players, MP3 audio players, mobile phones with MP3 type features, PDAs or similar equipment. Personal music players shall comply with the requirements of either 10.6.2 or 10.6.3. NOTE 1 Protection against acoustic energy sources from telecom applications is referenced to ITU-T P.360. NOTE 2 It is the intention of the Committee to allow the alternative methods for now, but to only use the dose measurement method as given in 10.6.5 in future. Therefore, manufacturers are encouraged to implement 10.6.5 as soon as possible.		N

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EN IEC62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Listening **devices** sold separately shall comply with the requirements of 10.6.6. These requirements are valid for music or video mode only. The requirements do not apply to: - **professional equipment**; NOTE 3 **Professional equipment** is equipment sold through special sales channels. All products sold through normal electronics stores or general public sales channels are considered not to be **professional equipment**. - hearing aid equipment and other devices for assistive listening; - the following type of analogue personal music players: - long distance radio receiver (for example, a multiband radio receiver or world band radio receiver, an AM radio receiver), and - cassette player/recorder; 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. - a player while connected to an external amplifier that does not allow the user to walk around while in use; - hearing protection devices (HPD) that comply with EN 352-8 For equipment that is clearly designed or intended primarily for use by children, the limits of the relevant toy standards may apply. The relevant requirements are given in EN 71-1:2014+A1:2018, 4.20 and the related tests methods and measurement distances apply.		N

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EN IEC62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
10.6.2	**Classification of devices without the capacity to estimate sound dose**		N
10.6.2.1	**General** This standard is transitioning from short-term based (30 s) requirements to long-term based (40 h) requirements. These clauses remain in effect only for devices that do not comply with sound dose estimation as stipulated in EN 50332-3:2017. For classifying the acoustic output *L*Aeq,*T*, measurements are based on the A-weighted equivalent sound pressure level over a 30 s period. 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, measurements may be done over the duration of the complete song. In this case, *T* becomes the duration of the song. NOTE Classical music, acoustic music and broadcast 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 content 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 does not exceed the required limit. For example, if the player is set with the programme simulation noise to 85 dB, but the average music level of the song is only 65 dB, 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 dB.		N

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EN IEC62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
10.6.2.2	**RS1 limits (to be superseded, see 10.6.3.2)** RS1 is a class 1 acoustic energy source that does not exceed the following: for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the *L*Aeq,*T* acoustic output shall be ≤ 85 dB when playing the fixed “programme simulation noise” described in EN 50332-1:2013. for equipment provided with a standardized connector (for example, a 3,5 mm headphone/earphone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 27 mV (analogue interface) or −25 dBFS (digital interface) when playing the fixed 214 “programme simulation noise” described in EN 50332-1:2013. The RS1 limits will be updated for all devices as per 10.6.3.2.		N
10.6.2.3	**RS2 limits (to be superseded, see 10.6.3.3)** RS2 is a class 2 acoustic energy source that does not exceed the following: for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or when the combination of player and listening device is known by other means such as setting or automatic detection, the LAeq,T acoustic output shall be ≤ 100 dB(A) when playing the fixed “programme simulation noise” as described in EN 50332-1:2013. for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 150 mV (analogue interface) or −10 dBFS (digital interface) when playing the fixed “programme simulation noise” as described in 226 EN 50332-1:2013.		N
10.6.2.4	**RS3 limits** RS3 is a class 3 acoustic energy source that exceeds RS2 limits.		N
10.6.3	**Classification of devices (new)**		N

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EN IEC62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
10.6.3.1	**General** Previous limits (10.6.2) created abundant false negative and false positive PMP sound level warnings. New limits, compliant with The Commission Decision 2009/490/EC of 23 June 2009, are given below.		N
10.6.3.2	**RS1 limits (new)** RS1 is a class 1 acoustic energy source that does not exceed the following: for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the LAeq,T acoustic output shall be ≤ 80 dB when playing the fixed “programme simulation noise” described in EN 50332-1:2013. for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 15 mV (analogue interface) or −30 dBFS (digital interface) when playing the fixed “programme simulation noise” described in EN 50332-1:2013.		N
10.6.3.3	**RS2 limits (new)** RS2 is a class 2 acoustic energy source that does not exceed the following: for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the weekly **sound exposure level**, as described in EN 50332-3:2017, shall be ≤ 80 dB when playing the fixed “programme simulation noise” described in 249 EN 50332-1:2013. for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output level, integrated over one week, as described in EN 50332-3:2017, shall be ≤ 15 mV (analogue interface) or −30 dBFS		N
10.6.4	**Requirements for maximum sound exposure**		N

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EN IEC62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
10.6.4.1	**Measurement methods** All volume controls shall be turned to maximum during tests. Measurements shall be made in accordance with EN 50332-1:2013 or EN 50332-2:2013 as applicable.		N
10.6.4.2	**Protection of persons** Except as given below, protection requirements for parts **accessible** to **ordinary persons**, **instructed persons** and **skilled persons** are given in 4.3. NOTE 1 Volume control is not considered to be a **safeguard.** Between RS2 and an **ordinary person**, the **basic safeguard** may be replaced by an **instructional safeguard** in accordance with Clause F.5, except that the **instructional safeguard** shall be placed on the equipment, or on the packaging, or in the instruction manual. Alternatively, the **instructional safeguard** may be given through the equipment display during use. The elements of the **instructional safeguard** shall be as follows: - element 1a: the symbol , IEC 60417-6044 (2011–01) - element 2: “High sound pressure” or equivalent text - element 3: “Hearing damage risk” or equivalent text - element 4: “Do not listen at high volume levels for long periods.” or equivalent text An **equipment safeguard** shall prevent exposure of an **ordinary person** to an RS2 source without intentional physical action from the **ordinary person** and shall automatically return to an output level not exceeding what is specified for an RS1 source when the power is switched off. The equipment shall provide a means to actively inform the user of the increased sound level when the equipment is operated with an output level exceeding RS1 limits. Any means used shall be acknowledged by the user before activating a mode of operation which allows for an output level exceeding RS1 limits. The acknowledgement does not need to be repeated more than once every 20 h of cumulative listening time.		N

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EN IEC62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	NOTE 2 Examples of means include visual or audible signals. Action from the user is always needed. NOTE 3 The 20 h listening time is the accumulative listening time, independent of how often and how long the personal music player has been switched off. A **skilled person** shall not be unintentionally exposed to RS3.		
10.6.5	**Requirements for dose-based systems**		N
10.6.5.1	**General requirements** Personal music players shall give the warnings as provided below when tested according to 281 EN 50332-3:2017, using the limits from this clause. The manufacturer may offer optional settings to allow the users to modify when and how they wish to receive the notifications and warnings to promote a better user experience without defeating the **safeguards**. This allows the users to be informed in a method that best meets their physical capabilities and device usage needs. If such optional settings are offered, an administrator (for example, parental restrictions, business/educational administrators, etc.) shall be able to lock any optional settings into a specific configuration. The personal music player shall be supplied with easy to understand explanation to the user of the dose management system, the risks involved, and how to use the system safely. The user shall be made aware that other sources may significantly contribute to their sound exposure, for example work, transportation, concerts, clubs, cinema, car races, etc.		N
10.6.5.2	**Dose-based warning and requirements** When a dose of 100 % CSD is reached, and at least at every 100 % further increase of CSD, the device shall warn the user and require an acknowledgement. In case the user does not acknowledge, the output level shall automatically decrease to a level in compliance with class RS1 limits. The warning shall at least clearly indicate that listening above 100 % CSD leads to the risk of hearing damage or loss.		N

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EN IEC62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
10.6.5.3	**Exposure-based requirements** With only dose-based requirements, cause and effect could be far separated in time, defying the purpose of educating users about safe listening practice. In addition to dose-based requirements, a PMP shall therefore also put a limit to the short-term sound level a user can listen at. The exposure-based limiter (EL) shall automatically reduce the sound level not to exceed 100 dB(A) or 150 mV integrated over the past 180 s, based on methodology defined in EN 50332-3:2017. The EL settling time (time from starting level reduction to reaching target output level) shall be 10 s or less. Test of EL functionality is conducted according to EN 50332-3:2017, using the limits from this clause. For equipment provided as a package (player with its listening device), the level integrated over 180 s shall be 100 dB or lower. For equipment provided with a standardized connector, the un-weighted level integrated over 180 s shall be no more than 150 mV for an analogue interface and no more than −10 dBFS for a digital interface. In case the source is known not to be music (or test signal), the EL may be disabled.		N
10.6.6	**Requirements for listening devices (headphones, earphones, etc.)**		N
10.6.6.1	**Corded listening devices with analogue input** With 94 dB *L*Aeq acoustic pressure output of the listening device, and with the volume and sound settings in the listening device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximizes the measured acoustic output level, the input voltage of the listening device when playing the fixed “programme simulation noise” as described in EN 50332-1:2013 shall be ≥ 75 mV. NOTE The values of 94 dB and 75 mV correspond with 85 dB and 27 mV in 10.6.2.2. or 100 dB and 150 mV in 10.6.2.3.		N
10.6.6.2	**Corded listening devices with digital input** With any playing device playing the fixed “programme simulation noise” described in EN 50332-1:2013, and with the volume and sound settings in the listening device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output, the *L*Aeq,*T* acoustic output of the listening device shall be ≤ 100 dB with an input signal of −10 dBFS.		N

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EN IEC62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
10.6.6.3	**Cordless listening devices** In cordless mode, with any playing and transmitting device playing the fixed programme simulation noise described in EN 50332-1:2013; and respecting the cordless transmission standards, where an air interface standard exists that specifies the equivalent acoustic level; and with volume and sound settings in the receiving device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output for the above mentioned programme simulation noise, the *L*Aeq,*T* acoustic output of the listening device shall be ≤ 100 dB with an input signal of −10 dBFS.		N
10.6.6.4	**Measurement method** Measurements shall be made in accordance with EN 50332-2:2013 as applicable.”		N
16	**Modification to subclause G.3.1.2**		--
	Add the following note after the first paragraph: “NOTE Z1 An IEC 60730 series standard is considered relevant if the component in question falls within its scope.”		N
17	**Modification to subclause G.7.1**		--
	Add the following note at the end of the subclause: “NOTE Z1 The harmonized code designations corresponding to the IEC cable types are given in Annex ZD.”		N
18	**Modification to subclause M.2**		--
	Add the following paragraph after the first paragraph: “The size of the battery compartment shall be designed taking into account the battery compartment recommendations of the relevant battery standard. NOTE For general guidance on the design of the battery compartment, see Clause 8 of IEC 62485-4.”		N
19	**Modification to Bibliography**		--

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EN IEC62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Add the following notes for the standards indicated: IEC 60060-1 NOTE Harmonized as EN 60060-1. IEC 60130-9 NOTE Harmonized as EN 60130-9. IEC 60204-1 NOTE Harmonized as EN IEC 60204-1. IEC 60204-11 NOTE Harmonized as EN IEC 60204-11. IEC 60243-1 NOTE Harmonized as EN 60243-1. IEC 60269-2 NOTE Harmonized as HD 60269-2. IEC 60309-1 NOTE Harmonized as EN 60309-1. IEC 60364 NOTE some parts harmonized in HD 384/HD 60364 series. IEC 60601-2-4 NOTE Harmonized as EN 60601-2-4. IEC 60664-5:2005 NOTE Harmonized as EN 60664-5:2007. IEC 60721-3-4 NOTE Harmonized as EN IEC 60721-3-4. IEC 61032:1997 NOTE Harmonized as EN 61032:1998 (not modified). IEC 61180 NOTE Harmonized as EN 61180. IEC 61508-1 NOTE Harmonized as EN 61508-1. IEC 61558-2-1 NOTE Harmonized as EN 61558-2-1. IEC 61558-2-4 NOTE Harmonized as EN 61558-2-4. IEC 61558-2-6 NOTE Harmonized as EN 61558-2-6. IEC 61643-21 NOTE Harmonized as EN 61643-21. IEC 61643-311 NOTE Harmonized as EN 61643-311. IEC 61643-321 NOTE Harmonized as EN 61643-321. IEC 61643-331 NOTE Harmonized as EN IEC 61643-331. IEC 61140:2016 NOTE Harmonized as EN 61140:2016. IEC 61439-5:2014 NOTE Harmonized as EN 61439-5:2015. IEC 61969-3 NOTE Harmonized as EN 61969-3. IEC 62040:2017 NOTE Harmonized as EN IEC 62040:2019. IEC 62305-1 NOTE Harmonized as EN 62305-1. IEC 62368-3 NOTE Harmonized as EN 62368-3. IEC 62485-4 NOTE Harmonized as EN IEC 62485-4. ISO 10218-1 NOTE Harmonized as EN ISO 10218-1. ISO 10218-2 NOTE Harmonized as EN ISO 10218-2. ISO 13482 NOTE Harmonized as EN ISO 13482. ISO 13850 NOTE Harmonized as EN ISO 13850.		P
20	**Addition of annexes**		

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EN IEC62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
ZB	**ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)**		N
4.1.15	**Finland, Norway** and **Sweden** To the end of the subclause the following is added: **Class I pluggable equipment type A** intended for connection to other equipment or a network shall, if safety relies on connection to reliable earthing or if surge suppressors are connected between the network terminals and **accessible** parts, have a marking stating that the equipment shall be connected to an earthed **mains** socket-outlet. The marking text in the applicable countries shall be as follows: In **Finland**: “Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan” In **Norway**: “Apparatet må tilkoples jordet stikkontakt” In **Sweden**: “Apparaten skall anslutas till jordat uttag”		N
4.7.3	**United Kingdom** To the end of the subclause the following is added: The torque test is performed using a socket-outlet complying with BS 1363, and the plug part shall be assessed to the relevant clauses of BS 1363. Also see Annex G.4.2 of this annex.		N
5.4.11.1 and Annex G	**Finland and Sweden** To the end of the subclause the following is added: For separation of the telecommunication network from earth the following is applicable: 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.		N

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EN IEC62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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 5.4.7 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 5.4.9 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 60384-14, subclass Y2. A capacitor classified Y3 according to EN 60384-14, may bridge this insulation under the following conditions: -the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 60384-14, which in addition to the Y3 testing, is tested with an impulse test of 2,5 kV defined in 5.4.10; -the additional testing shall be performed on all the test specimens as described in EN 60384-14; -the impulse test of 2,5 kV is to be performed before the endurance test in EN 60384-14, in the sequence of tests as described in EN 60384-14.		
5.5.2.1	**Norway** After the 3rd paragraph the following is added: Due to the IT power distribution system used, capacitors are required to be rated for the applicable line-to-line voltage (230 V).		N

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EN IEC62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.5.6	**Finland, Norway** and **Sweden** To the end of the subclause the following is added: Resistors used as **basic safeguard** or bridging **basic insulation** in **class I pluggable** **equipment type A** shall comply with G.10.1 and the test of G.10.3.		N
5.6.4.2.1	**Ireland and United Kingdom** After the indent for **pluggable equipment type A**, the following is added: -the **protective current rating** is taken to be 13 A, this being the largest rating of fuse used in the **mains** plug.		N
5.6.4.2.1	**France** After the indent for **pluggable equipment type A**, the following is added: -in certain cases, the **protective current rating** of the circuit supplied from the **mains** is taken as 20 A instead of 16 A. *Justification:* In France, according to NF C15-100 standard, in certain cases, the maximum rated current of the protective **device** circuit-breaker is 20 A.		N
5.6.5.1	**Ireland and United Kingdom** To the second paragraph the following is added: The range of conductor sizes of flexible cords to be accepted by terminals for equipment with a rated current over 10 A and up to and including 13 A is: 1,25 mm2 to 1,5 mm2 in cross-sectional area.		N
5.6.8	**Norway** To the end of the subclause the following is added: Equipment connected with an earthed mains plug is classified as **class I equipment**. See the Norway marking requirement in 4.1.15. The symbol IEC 60417-6092, as specified in F.3.6.2, is accepted.		N
5.7.7.1	**Norway and Sweden** To the end of the subclause the following is added: The screen of the television 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 needs to be isolated from the screen of a cable distribution system.		N

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EN IEC62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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 a retailer, for example. 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: “Apparatus connected to the protective earthing of the building installation through the mains connection or through other apparatus with a connection to protective earthing – and to a television distribution system using coaxial cable, may in some circumstances create a fire hazard. Connection to a television distribution system therefore has 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 CATV-installations, and in Sweden, a galvanic isolator shall provide electrical insulation below 5 MHz. The insulation shall withstand a dielectric strength of 1,5 kV RMS, 50 Hz or 60 Hz, for 1 min. Translation to Norwegian (the Swedish text will also be accepted in Norway): “Apparater som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkoplet utstyr – og er tilkoplet et koaksialbasert kabel-TV nett, kan forårsake brannfare. For å unngå dette skal det ved tilkopling av apparater til kabel-TV nett installeres en galvanisk isolator mellom apparatet og kabel-TV nettet.” Translation to Swedish: ”Apparater 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 apparaten till kabel-TV nät galvanisk isolator finnas mellan apparaten och kabel-TV nätet”.		

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EN IEC62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
8.5.4.2.3	**United Kingdom** Add the following after the 2nd dash bullet in 3rd paragraph: An emergency stop system complying with the requirements of EN IEC 60204-1 and EN ISO 13850 is required where there is a risk of personal injury.		N
B.3.1 and B.4	**Ireland and United Kingdom** The following is applicable: To protect against excessive currents and short-circuits in the primary circuit of **direct plug-in equipment**, tests according to Annexes B.3.1 and B.4 shall be conducted using an external miniature circuit breaker complying with EN 60898-1, Type B, rated 32A. If the equipment does not pass these tests, suitable protective devices shall be included as an integral part of the **direct plug-in equipment**, until the requirements of Annexes B.3.1 and B.4 are met		N
G.4.2	**United Kingdom** To the end of the subclause the following is added: 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
G.7.1	**United Kingdom** To the first paragraph the following is added: Equipment 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 shall be fitted with a ‘standard plug’ in accordance with the Plugs and Sockets etc. (Safety) Regulations 1994, Statutory Instrument 1994 No. 1768, 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

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EN IEC62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
G.7.1	**Ireland** To the first paragraph the following is added: Apparatus which is fitted with a flexible cable or cord shall be provided with a plug in accordance with Statutory Instrument 525: 1997, “13 A Plugs and Conversion Adapters for Domestic Use Regulations: 1997. S.I. 525 provides for the recognition of a standard of another Member State which is equivalent to the relevant Irish Standard		N
G.7.2	**Ireland and United Kingdom** To the first paragraph the following is added: A power supply cord with a conductor of 1,25 mm^2 is allowed for equipment which is rated over 10 A and up to and including 13 A.		N
ZC	**ANNEX ZC, NATIONAL DEVIATIONS (EN)**		**N**
10.5.2	**Germany** The following requirement applies: For the operation of any cathode ray tube intended for the display of visual images operating at an acceleration voltage exceeding 40 kV, authorization is required, or application of type approval (Bauartzulassung) and marking. *Justification*: German ministerial decree against ionizing radiation (Röntgenverordnung), in force since 2002-07-01, implementing the European Directive 96/29/EURATOM. NOTE Contact address: Physikalisch-Technische Bundesanstalt, Bundesallee 100, D-38116 Braunschweig, Tel.: Int+49–531–592–6320, Internet: http://www.ptb.de		N
ZD	**IEC and CENELEC CODE DESIGNATIONS FOR FLEXIBLE CORDS**		N

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EN IEC62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
			N

Type of flexible cord	Code designations	
	IEC	CENELEC
PVC insulated cords		
Flat twin tinsel cord	60227 IEC 41	H03VH-Y
Light polyvinyl chloride sheathed flexible cord	60227 IEC 52	H03VV-F H03VVH2-F
Ordinary polyvinyl chloride sheathed flexible cord	60227 IEC 53	H05VV-F H05VVH2-F
Rubber insulated cords		
Braided cord	60245 IEC 51	H03RT-F
Ordinary tough rubber sheathed flexible cord	60245 IEC 53	H05RR-F
Ordinary polychloroprene sheathed flexible cord	60245 IEC 57	H05RN-F
Heavy polychloroprene sheathed flexible cord	60245 IEC 66	H07RN-F
Cords having high flexibility		
Rubber insulated and sheathed cord	60245 IEC 86	H03RR-H
Rubber insulated, crosslinked PVC sheathed cord	60245 IEC 87	H03RV4-H
Crosslinked PVC insulated and sheathed cord	60245 IEC 88	H03V4V4-H
Cords insulated and sheathed with halogen-free thermoplastic compounds		
Light halogen-free thermoplastic insulated and sheathed flexible cords		H03Z1Z1-F H03Z1Z1H2-F
Ordinary halogen-free thermoplastic insulated and sheathed flexible cords		H05Z1Z1-F H05Z1Z1H2-F

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5.2	TABLE: Classification of electrical energy sources						P
Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters				ES Class
			U (V)	I (mA)	Type[1)]	Additional Info [2)]	
5V	Type-C input/Internal circuit	Normal	5.0Vdc	--	--	--	ES1
		Abnormal	--	--	--	--	
		Single fault:	--	--	--	--	
Fully charged battery	Battery pack	Normal	4.2Vdc	--	--	--	ES1
		Abnormal	--	--	--	--	
		Single fault:	--	--	--	--	
Supplementary information:							

5.4.1.8	TABLE: Working voltage measurement				N
Location	Peak voltage (V)	RMS voltage (V)	Frequency (Hz)	Comments	
--	--	--	--	--	
--	--	--	--	--	
Supplementary information:					

5.4.1.10.2	TABLE: Vicat softening temperature of thermoplastics		N
Method ..... :		ISO 306 / B50	—
Object/ Part No./Material	Manufacturer/trademark	Thickness (mm)	T softening (°C)
--	--	--	--
--	--	--	--
Supplementary information:			

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

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T2P bobbin is phenolic material, no test required.

5.4.2, 5.4.3	TABLE: Minimum Clearances/Creepage distance							N
Clearance (cl) and creepage distance (cr) at/of/between:	U_D (V)	U_{rms} (V)	Freq [1)] (Hz)	Required cl (mm)	cl (mm)	E.S. [2)] (V)	Required cr (mm)	cr (mm)
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
Supplementary information:								

5.4.4.2	TABLE: Minimum distance through insulation			N
Distance through insulation (DTI) at/of	Peak voltage (V)	Insulation	Required DTI (mm)	Measured DTI (mm)
--	--	--	--	--
--	--	--	--	--
Supplementary information:				

5.4.4.9	TABLE: Solid insulation at frequencies >30 kHz					N
Insulation material	E_P	Frequency (kHz)	K_R	Thickness *d* (mm)	Insulation	V_{PW} (Vpk)
--	--	--	--	--	--	--
Supplementary information:						

5.4.9	TABLE: Electric strength tests		N
Test voltage applied between:	Voltage shape (Surge, Impulse, AC, DC, etc.)	Test voltage (V)	Breakdown Yes / No
--	--	--	--
--	--	--	--
--	--	--	--
Supplementary information:			

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5.5.2.2	TABLE: Stored discharge on capacitors					N
Location	Supply voltage (V)	Operating and fault condition [1)]	Switch position	Measured voltage (Vpk)	ES Class	
--	--	--	--	--	--	
--	--	--	--	--	--	
--	--	--	--	--	--	
Supplementary information:						
X-capacitors installed for testing: [x] bleeding resistor rating: [ ] ICX: 1) Normal operating condition (e.g., normal operation), SC= short circuit, OC= open circuit						

5.6.6	TABLE: Resistance of protective conductors and terminations				N
Location	Test current (A)	Duration (min)	Voltage drop (V)	Resistance (Ω)	
--	--	--	--	--	
Supplementary information:					
The protective current rating does not exceed 25A.					

5.7.4	TABLE: Unearthed accessible parts					N
Location	Operating and fault conditions	Supply Voltage (V)	Parameters			ES class
			Voltage (V_{rms} or V_{pk})	Current (A_{rms} or A_{pk})	Freq. (Hz)	
--	--	--	--	--	--	--
	--	--	--	--	--	--
	--	--	--	--	--	--
	--	--	--	--	--	--
Supplementary information:						
Abbreviation: SC= short circuit; OC= open circuit All test combined in AC switch ON/OFF condition, normal and reverse polarity are also considered.						

5.7.5	TABLE: Earthed accessible conductive part	N
Supply voltage (V) ..... :	--	—
Phase(s) ..... :	[] Single Phase; [ ] Three Phase: [ ] Delta [ ] Wye	
Power Distribution System ..... :	[] TN []TT [ ] IT	

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Location	Fault Condition No in IEC 60990 clause 6.2.2	Touch current (mA)	Comment
--	--	--	--

Supplementary Information:

[1] Supply voltage is the anticipated maximum Touch Voltage.
[2] Earthed neutral conductor [Voltage differences less than 1% or more].
[3] Specify method used for measurement as described in IEC 60990 sub-clause 4.3.
[4] IEC60990, sub-clause 6.2.2.7, Fault 7 not applicable.
[5] (*) IEC60990, sub-clause 6.2.2.2 is not applicable if switch or disconnect device (e.g., appliance coupler) provided.

5.8	TABLE: Backfeed safeguard in battery backed up supplies					N
Location	Supply voltage (V)	Operating and fault condition	Time (s)	Open-circuit voltage (V)	Touch current (A)	ES Class
--	--	--	--	--	--	--

Supplementary information:

Abbreviation: SC= short circuit, OC= open circuit

6.2.2	TABLE: Power source circuit classifications					P
Location	Operating and fault condition	Voltage (V)	Current (A)	Max. Power[1)] (W)	Time (S)	PS class
Internal circuit	Normal	--	--	--	--	PS2 by declared
Type-C input	Normal	--	--	--	--	PS2 by declared
Battery cell	Overload	2.142	11.751	25.17	5	PS2

Supplementary information:

Abbreviation: SC= short circuit; OC= open circuit
1) Measured after 3 s for PS1 and measured after 5 s for PS2 and PS3.

6.2.3.1	TABLE: Determination of Arcing PIS				N
Location	Open circuit voltage after 3 s (Vpk)	Measured r.m.s current (A)	Calculated value	Arcing PIS? Yes / No	
--	--	--	--	--	

Supplementary information:

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

6.2.3.2	TABLE: Determination of resistive PIS	P

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Location	Operating and fault condition	Dissipate power (W)	Resistive PIS? Yes / No
All internal circuit	--	--	Yes (Declared)
Supplementary information:			

8.5.5	TABLE: High pressure lamp			N
Lamp manufacturer	Lamp type	Explosion method	Longest axis of glass particle (mm)	Particle found beyond 1 m Yes / No
--	--	--	--	--
Supplementary information:				

9.6	TABLE: Temperature measurements for wireless power transmitters	N
Supply voltage (V) .....:	--	—
Max. transmitting power (W).....:	--	—

Part A[1)]

Foreign objects	w/o receiver and direct contact		with receiver and direct contact		with receiver and at distance of 2 mm		with receiver and at distance of 5 mm	
	Object (°C)	Ambient (°C)	Object (°C)	Ambient (°C)	Object (°C)	Ambient (°C)	Object (°C)	Ambient (°C)
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
Measurement temperature T of part/at:	w/o receiver and direct contact		with receiver and direct contact		with receiver and at distance of 2 mm		with receiver and at distance of 5 mm	
	T (°C)	Ambient (°C)	T (°C)	Ambient (°C)	T (°C)	Ambient (°C)	T (°C)	Ambient (°C)
--	--	--	--	--	--	--	--	--

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Part B [2]								
Foreign objects	w/o receiver and direct contact		with receiver and direct contact		with receiver and at distance of 2 mm		with receiver and at distance of 5 mm	
	Object (°C)	Ambient (°C)	Object (°C)	Ambient (°C)	Object (°C)	Ambient (°C)	Object (°C)	Ambient (°C)
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
Measurement temperature T of part/at:	w/o receiver and direct contact		with receiver and direct contact		with receiver and at distance of 2 mm		with receiver and at distance of 5 mm	
	T (°C)	Ambient (°C)	T (°C)	Ambient (°C)	T (°C)	Ambient (°C)	T (°C)	Ambient (°C)
--	--	--	--	--	--	--	--	--
Supplementary information:								
1) The test is performed by powering up the transmitter and then placing each of the foreign objects specified in 9.6.2 in direct contact with the transmitter. 2) The test is performed by first placing each of the foreign objects specified in 9.6.2 in direct contact with the transmitter and then powering up transmitter.								

5.4.1.4, 9.3, B.1.5, B.2.6	**TABLE: Temperature measurements**				**P**
Supply voltage (V)..... :	See below				—
Ambient temperature during test T_{amb} (°C) .... :	See below	See below	See below	--	—
Maximum $_{measured}$ temperature T of part/at:	T (°C)				Allowed T_{max} (°C)
Test condition:	A)	B)	C)	--	--
Battery body	55.4	56.7	49.5	--	Ref.
Internal wire	56.1	57.3	50.7	--	80
PCB near U1	73.5	74.4	53.6	--	130
PCB near U8	52.4	53.7	59.8	--	130
Plastic enclosure inside near PCB U1	61.6	62.8	50.3	--	Ref.
Plastic enclosure inside near Battery	50.8	52.2	45.9	--	Ref.
Ambient	40.0	40.0	40.0	--	--
For accessible part					
Plastic enclosure outside near PCB U1	37.1	37.7	31.5	--	77
Plastic enclosure outside near Type-C	34.6	35.2	32.8	--	77
Button	30.3	31.5	29.6	--	77
Ambient	25.0	25.0	25.0	--	--

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Temperature T of winding	t_1 (°C)	R_1 (Ω)	t_2 (°C)	R_2 (Ω)	T (°C)	Allowed T_{max} (°C)	Insulation class
--	--	--	--	--	--	--	--
Supplementary information:							
Condition A: Off mode charging by 5Vdc via Type-C with fully discharged battery. Condition B: Charging while the unit operates normally under Bluetooth mode, playing a 1/8 power of non-clipped output power, 1kHz sinusoidal wave. Condition C: Bluetooth mode, powered by fully charged battery, playing a 1/8 power of non-clipped output power, 1kHz sinusoidal wave. Note: The maximum operating temperature is 40°C.							

B.2.5	**TABLE: Input test**							**P**
U (V)	Hz	I (A)	I rated (A)	P (W)	P rated (W)	Fuse No	I fuse (A)	Condition/status
5.0	--	0.543	1	2.72	--	--	--	Off mode charging by 5Vdc via Type-C with fully discharged battery. Battery charge current: 0.538A
5.0	--	0.542	1	2.71	--	--	--	Charging while the unit operates normally under Bluetooth mode, playing a 1/8 power of non-clipped output power, 1kHz sinusoidal wave. Battery charge current: 0.435A
Internal battery	--	0.096	--	--	--	--	--	Bluetooth mode, powered by fully charged battery, playing a 1/8 power of non-clipped output power, 1kHz sinusoidal wave.
Supplementary information:								

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B.2.5, E.3.1	TABLE: Input test for equipment containing audio amplifiers				P
Operation Condition	Signal type	Frequency (Hz)	Output loads (Ω)	Load setup	
A1	Sine wave input	1000	--	All channels driven, (maximum) non-clipped output power	
A2	Peak response frequency	--	--	All channels driven, (maximum) non-clipped output power	
B1	Sine wave input	1000	--	All channels driven, 1/8 non-clipped output power	
B2	Peak response frequency	--	--	All channels driven, 1/8 non-clipped output power	
C	Band-limited pink noise signal	--	--	All channels driven, 1/8 non-clipped output power	
D	--	--	--	--	

Input									Amplifier Output			
Cond.	U (V)	Hz	I (A)	I rated (A)	P (W)	P rated (W)	Fuse No	I fuse (A)	Ch.	U (V)	P (W)	Load (Ω)
B1	4.2	--	0.096	--	--	--	--	--	--	1.42	0.672	3

Supplementary information:

B.3, B.4	TABLE: Abnormal operating and fault condition tests					P
Ambient temperature T_{amb} (°C) .....:				25°C, if not specified		—
Power source for EUT: Manufacturer, model/type, outputrating ..:				--		—
Component No.	Condition	Supply voltage (V)	Test time	Fuse no.	Fuse current (A)	Observation
Off mode charging by 5Vdc via Type-C with fully discharged battery.						
U1 pin 1-3	S-C	5.0	30min	--	--	Unit working normally. No damage, no hazard. Input current: 0.543A→0.0005A Battery charge current: 0.538A→0.210A
U1 pin 3-4	S-C	5.0	30min	--	--	Unit working normally. No damage, no hazard. Input current: 0.543A→0.543A Battery charge current: 0.538A→0.538A

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B- and P-	S-C	5.0	7hr	--	--	Unit working normally. No damaged, no hazards. Input current: 0.543A→0.543A Battery charge current: 0.538A→0.538A
Battery NTC	SC	5.0	10min	--	--	Unit shut down. No damage, no hazard. Input current: 0.543A→0A Battery charge current: 0.538A→0A
Battery NTC	OC	5.0	10min	--	--	Unit shut down. No damage, no hazard. Input current: 0.543A→0A Battery charge current: 0.538A→0A
Bluetooth mode, powered by fully charged battery, playing a 1/8 power of non-clipped output power, 1kHz sinusoidal wave.						
Speaker	S-C	Internal battery	10min	--	--	Unit working normally. No damaged, no hazards. Battery discharge current: 0.096A→0.06A
U8 pin 8-9	S-C	Internal battery	10min	--	--	Unit working normally. No damaged, no hazards. Battery discharge current: 0.096A→0.06A
U8 pin 1-8	S-C	Internal battery	10min	--	--	Unit working normally. No damaged, no hazards. Battery discharge current: 0.096A→0.007A
U8 pin 1-9	S-C	Internal battery	10min	--	--	Unit working normally. No damaged, no hazards. Battery discharge current: 0.096A→0.007A
U3 pin 8-9	S-C	Internal battery	10min	--	--	Unit working normally. No damaged, no hazards. Battery discharge current: 0.096A→0.058A
U3 pin 1-8	S-C	Internal battery	10min	--	--	Unit working normally. No damaged, no hazards. Battery discharge current: 0.096A→0.006A
Supplementary information:						
1) OL: overload. SC: short circuit. OC: open circuit.						

M.3	**TABLE: Protection circuits for batteries provided within the equipment**		**P**
Is it possible to install the battery in a reverse polarity position? ..... :		No	—
Equipment Specification	Charging		
	Voltage (V)	Current (A)	

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	5				1	
Manufacturer/type	Battery specification					
	Non-rechargeable batteries		Rechargeable batteries			
	Discharging current (mA)	Unintentional charging current (mA)	Charging		Discharging current (A)	Reverse charging current (A)
			Voltage (V)	Current (A)		
Xinxiang Hongli Supply Source Technology Co.,Ltd. / IMR18650-1200mAh	--	--	4.2	0.6	0.6	--

Note: The tests of M.3.2 are applicable only when above appropriate data is not available.

Specified battery temperature (^{o}C)..... :	0-45°C	

Component No.	Fault condition	Charge/ discharge mode	Test time	Temp. (^{o}C)	Current (A)	Voltage (V)	Observation
--	--	--	--	--	--	--	--

Supplementary information:

Abbreviation: SC= short circuit; OC= open circuit NL= no chemical leakage; NS= no spillage of liquid; NE= no explosion; NF= no emission of flame or expulsion of molten metal.

M.4.2	**TABLE: Charging safeguards for equipment containing a secondary lithium battery**	**P**
Maximum specified charging voltage (V) .....:	4.2V	—
Maximum specified charging current (A) .....:	0.6A	—
Highest specified charging temperature (^{o}C) .....:	45°C	—
Lowest specified charging temperature (^{o}C) .....:	0°C	—

Battery manufacturer/type	Operating and fault condition	Measurement			Observation
		Charging voltage (V)	Charging current (A)	Temp. (^{o}C)	
Xinxiang Hongli Supply Source Technology Co.,Ltd. / IMR18650-1200mAh	Normal	4.14	0.543	--	The battery charging voltage does not exceed 4.2V and the battery charging current does not exceed 0.6A.
Xinxiang Hongli Supply Source Technology Co.,Ltd. / IMR18650-1200mAh	Single fault: U1 pin 3-4 SC	4.14	0.543	--	The battery charging voltage does not exceed 4.2V and the battery charging current does not exceed 0.6A.
Xinxiang Hongli Supply Source Technology Co.,Ltd. / IMR18650-1200mAh	LSCT	--	0	0	Unit stop charging at -1.7^{o}C, no damage, no hazard.
Xinxiang Hongli Supply Source Technology Co.,Ltd. /	HSCT	--	0	45	Unit stop charging at 39.7^{o}C, no damage, no hazard.

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IMR18650-1200mAh					
Supplementary information:					
Abbreviation: SC= short circuit; OC= open circuit; MSCV= maximum specified charging voltage; MSCC= maximum specified charging current; HSCT= highest specified charging temperature; LSCT= lowest specified charging temperature					

Q.1	**TABLE: Circuits intended for interconnection with building wiring (LPS)**						**N**
Output Circuit	Condition	U_{oc} (V)	Time (s)	I_{sc} (A)		S (VA)	
				Meas.	Limit	Meas.	Limit
--	--	--	--	--	--	--	--
Supplementary Information:							

T.2, T.3, T.4, T.5	**TABLE: Steady force test**					**P**
Location/Part	Material	Thickness (mm)	Probe	Force (N)	Test Duration (s)	Observation
Top enclosure	Plastic	See table 4.1.2	30mm probe	100	5	No damaged
Side enclosure	Plastic	See table 4.1.2	30mm probe	100	5	No damaged
Bottom enclosure	Plastic	See table 4.1.2	30mm probe	100	5	No damaged
Supplementary information:						

T.6, T.9	**TABLE: Impact test**			**N**
Location/Part	Material	Thickness (mm)	Height (mm)	Observation
--	--	--	--	--
--	--	--	--	--
Supplementary information:				

T.7	**TABLE: Drop test**			**P**
Location/Part	Material	Thickness (mm)	Height (mm)	Observation
Top enclosure	Plastic	See table 4.1.2	1000	No damaged
Side enclosure	Plastic	See table 4.1.2	1000	No damaged
Bottom enclosure	Plastic	See table 4.1.2	1000	No damaged
Supplementary information:				

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T.8	TABLE: Stress relief test					P
Location/Part	Material	Thickness (mm)	Oven Temperature (°C)	Duration (h)	Observation	
Completed sample	Plastic enclosure (for all sources)	See table 4.1.2	70	7	No damaged, no hazards.	
Supplementary information:						

X	TABLE: Alternative method for determining minimum clearances distances			N
Clearance distanced between	Peak of working voltage (V)	Required cl (mm)	Measured cl (mm)	
--	--	--	--	
Supplementary information:				

4.1.2	TABLE: Critical components information				P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity[1)2)]
Speaker	Shenzhen Sound Password electroacoustic co., Ltd.	SMM45-173	3Ω, 5W	EN IEC 62368-1	Tested with appliance
Battery	Xinxiang Hongli Supply Source Technology Co.,Ltd.	IMR18650-1200mAh	3.7V, 1200mAh, 4.44Wh Max charge current: 600mA; Max discharge current: 600mA;	IEC 62133-2:2017, IEC 62133-2:2017/AMD1:2021	Test Report No.: CN24K3MI 001
Internal wire	Interchangeable	Interchangeable	Min.28AWG, min. 80°C, min. 30Vac, VW-1	UL 758	UL
PCB	Shenzhen Lutongda Technology Co Ltd	LTD-M	V-0, 130°C	UL 94, UL796	UL E486889
Alternative	Interchangeable	Interchangeable	V-0, 130°C	UL 94, UL796	UL
Plastic enclosure	FORMOSA CHEMICALS & FIBRE CORP PLASTICS DIV	AC310(+)	V-0, min. 1.0mm thickness, 60ºC	UL 94	UL E162823
Supplementary information: 1) Provided evidence ensures the agreed level of compliance. See OD-2039. 2) "Tested with appliance" means the standards that state in General remarks section of this report.					

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Attachment A
Photos of product

Fig. 1 – Overall view

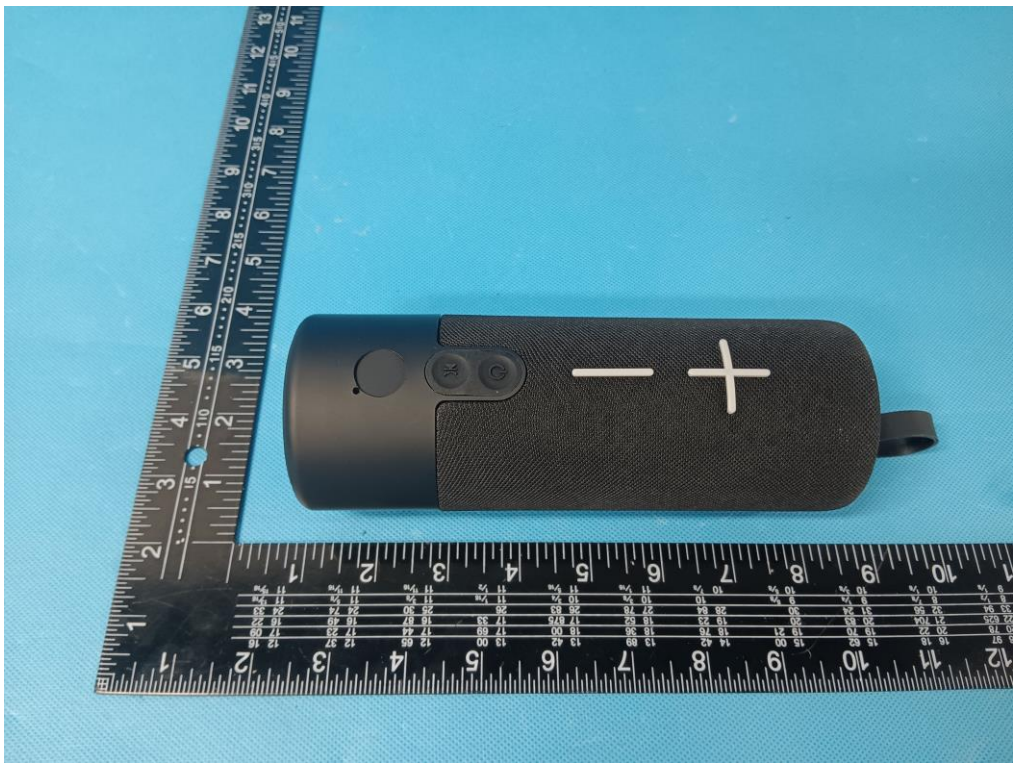

Fig. 2 – Over view

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Fig. 3 – Over view

Fig. 4 – Over view

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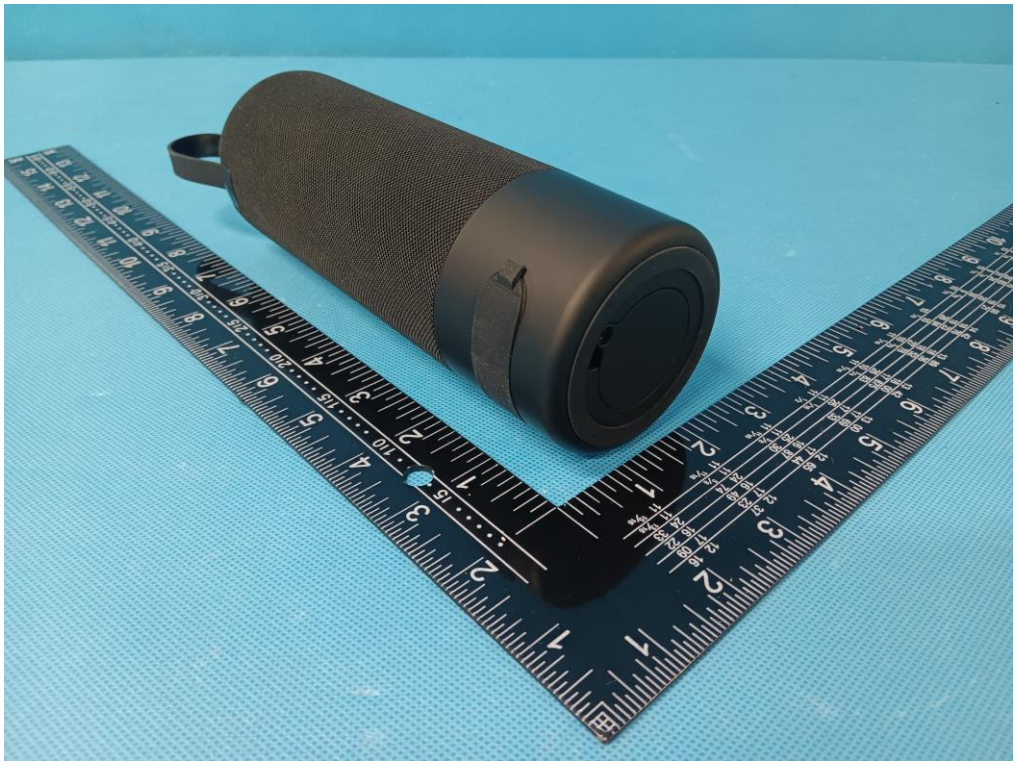

Fig. 5 – Over view

Fig. 6 – Open view

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Fig. 7 – Open view

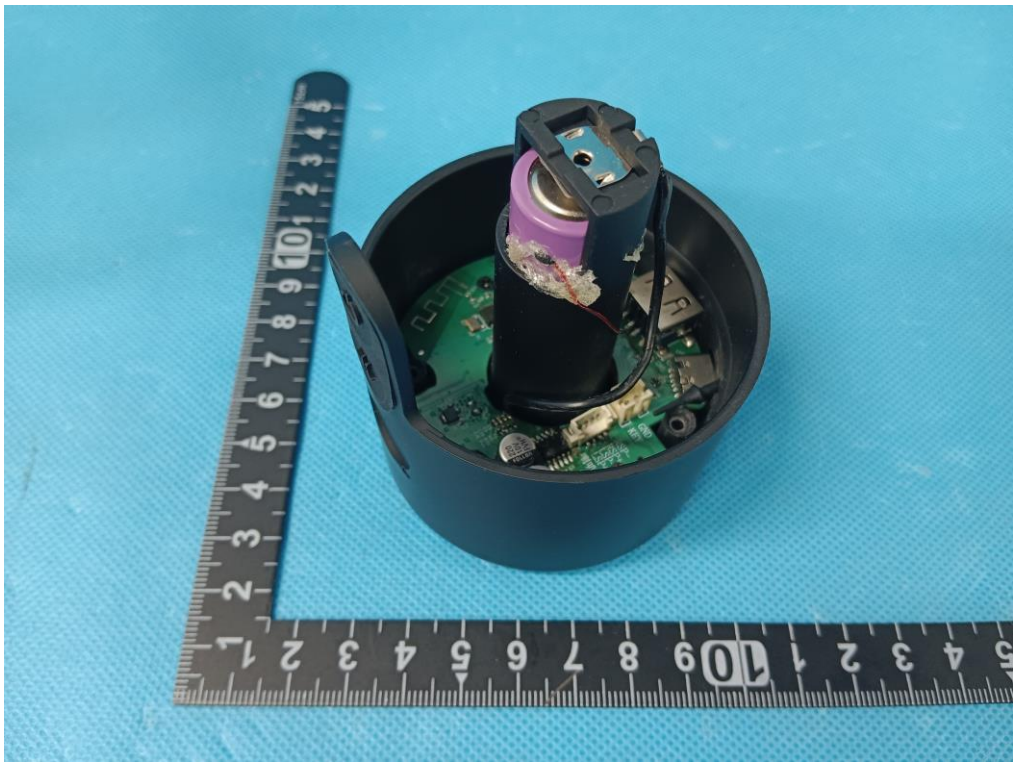

Fig. 8 – Open view

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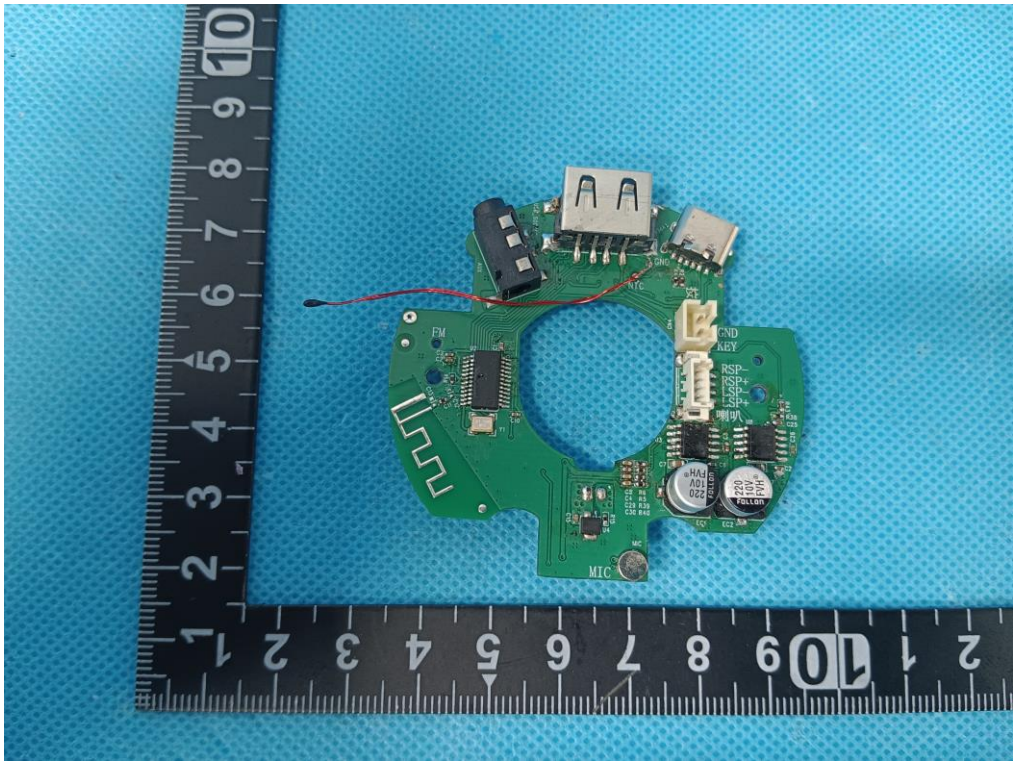

Fig. 9 – PCB view

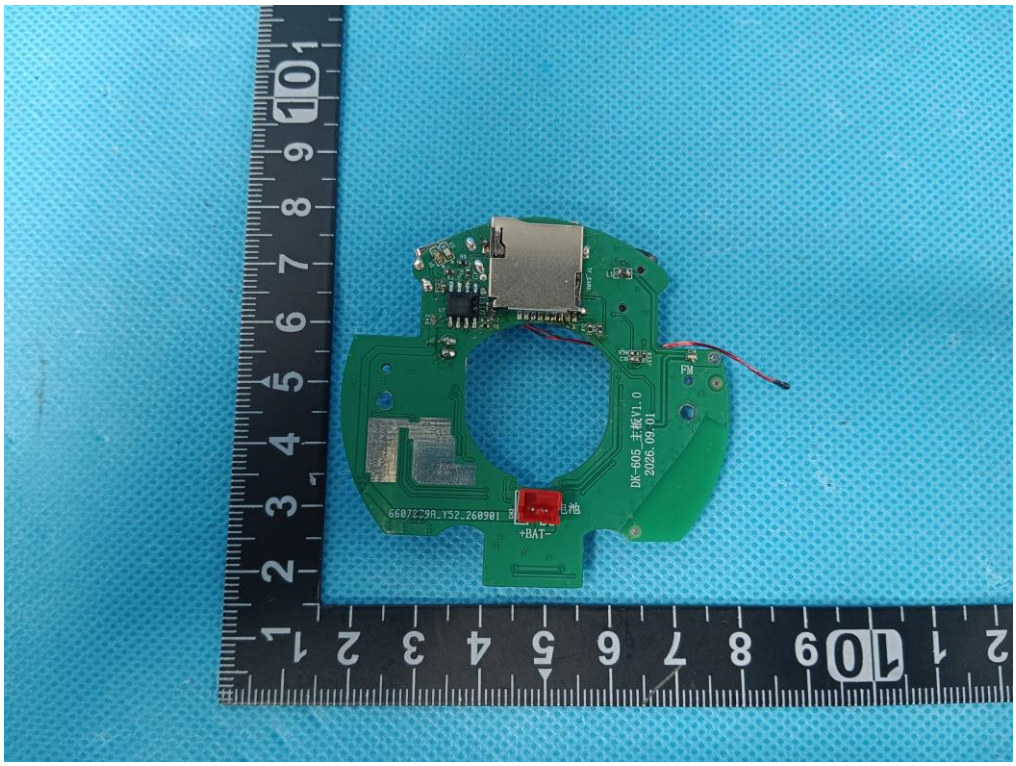

Fig. 10 – PCB view

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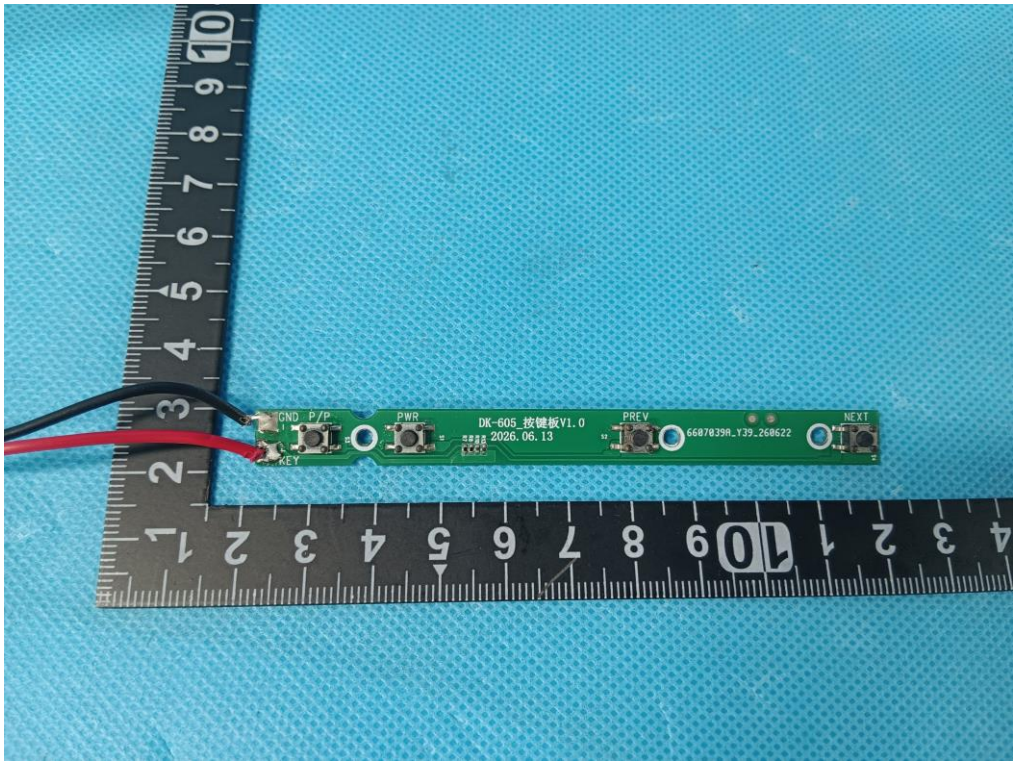

Fig. 11 – PCB view

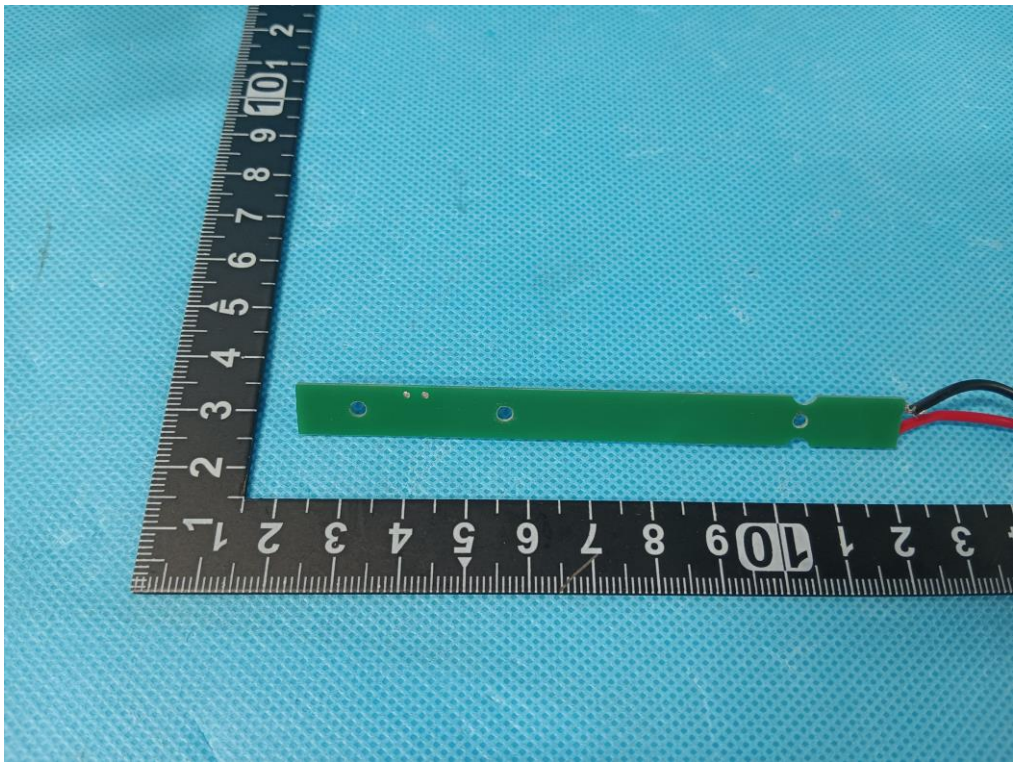

Fig. 12 – PCB view

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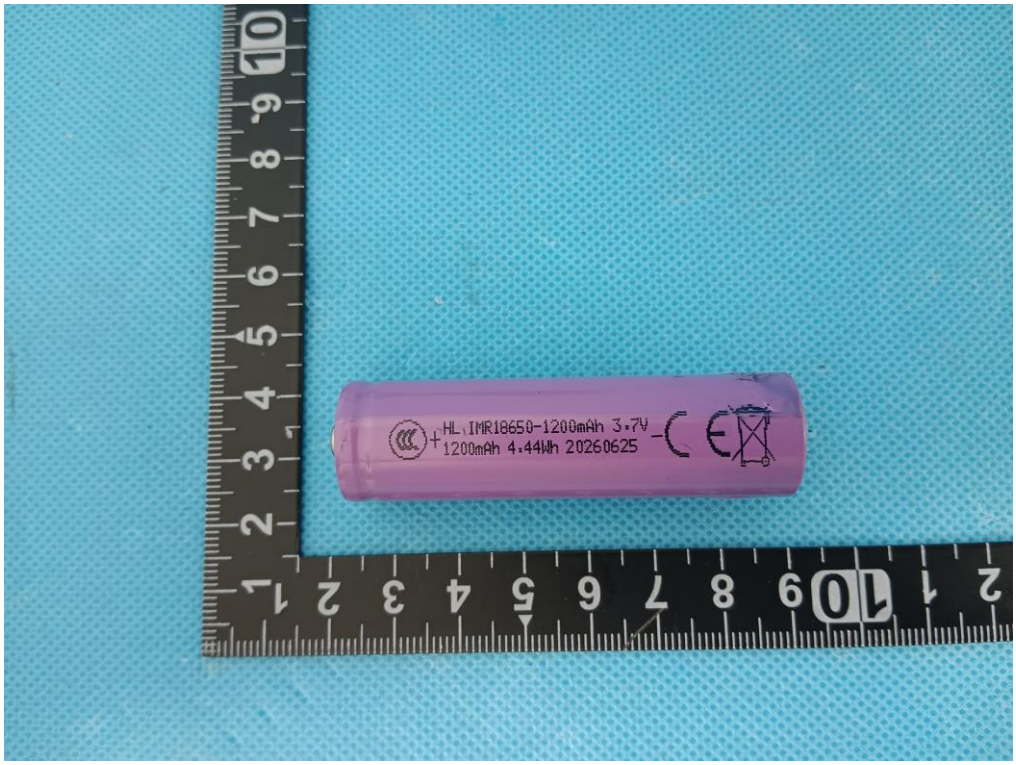

Fig. 13 – Battery view

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Conditions of Issuance of Test Reports

1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd (the "Company") solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the "Clients").
2. Any report issued by Company as a result of this application for testing services (the "Report") shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.
3.The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.
4. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.
5. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.
6. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.
7.Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.
8. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.
9. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.

-----END OF REPORT-----

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