

TEST REPORT

EN IEC 62368-1

IEC 62368-1

Audio/video, information and communication technology equipment –

Part 1: Safety requirements

Report reference No.: DG1220704-29976E-SF-A1

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Date of issue: 2022-07-13

Testing laboratory: Bay Area Compliance Laboratories Corp. (Dongguan)

Address: No.12, Pulong East 1st Road, Tangxia Town, Dongguan,
Guangdong, China

Testing location: See above

Applicant's name: Shenzhen Sonoff Technologies Co.,Ltd.

Address.....: 3F & 6F, Bldg A, No. 663, Bulong Rd, Shenzhen, Guangdong, China

Manufacturer's name.....: Shenzhen Sonoff Technologies Co.,Ltd.

Address.....: 3F & 6F, Bldg A, No. 663, Bulong Rd, Shenzhen, Guangdong, China

Factory's name: N/A

Address.....: N/A

Standard: EN IEC 62368-1:2020+A11:2020
IEC 62368-1:2018

Test sample(s) received: 2021-11-16

Test in period.....: 2021-11-17 to 2022-01-25

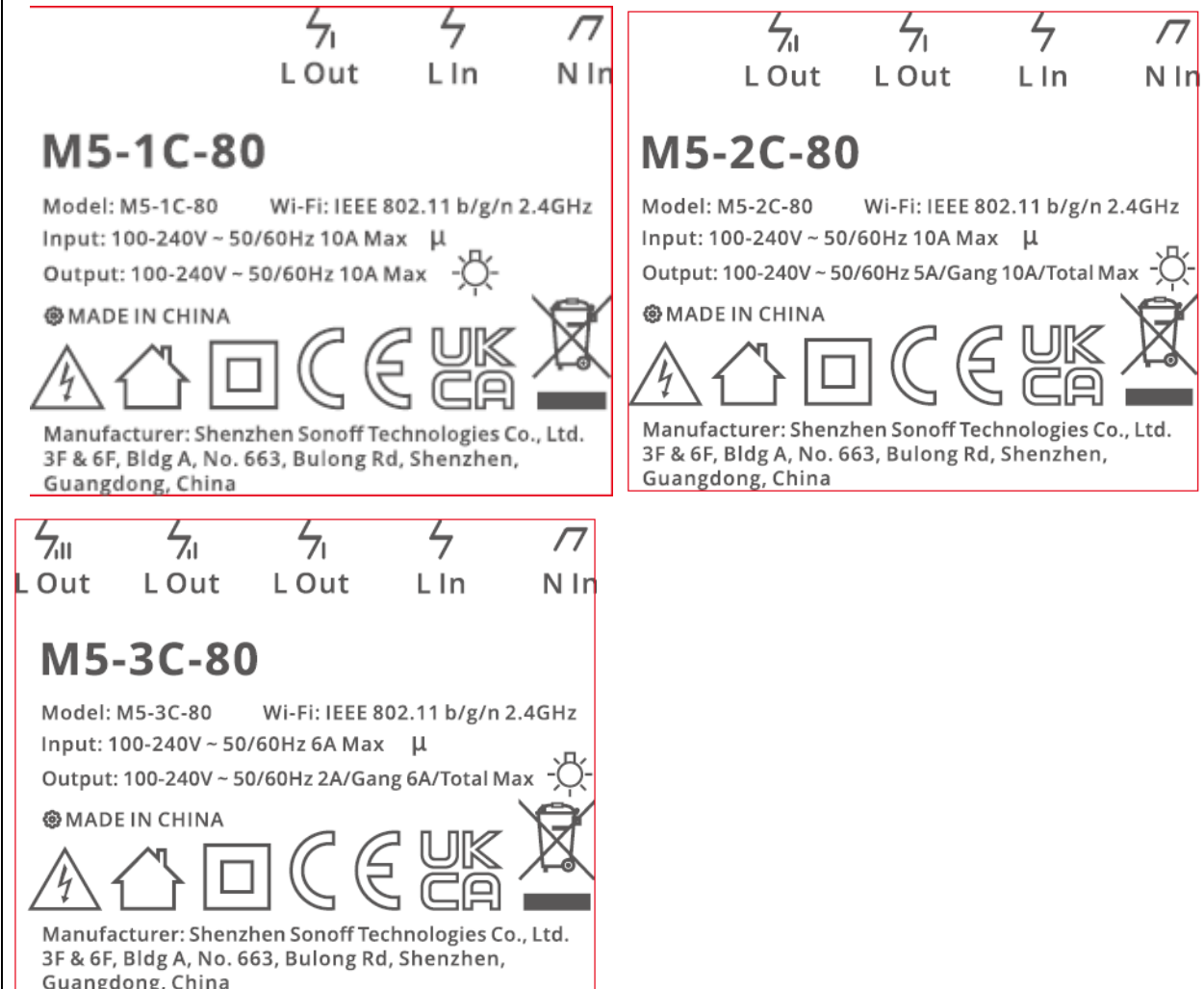
Procedure deviation: N/A

Non-standard test method: N/A

Type of test object	: SONOFF SwitchMan Smart Wall Switch
Trademark	: SONOFF
Tested model	: M5-3C-80, M5-2C-80, M5-1C-80, M5-1C-80W, M5-2C-80W, M5-3C-80W, M5-1C-80G, M5-2C-80G, M5-3C-80G
Manufacturer.....	: Shenzhen Sonoff Technologies Co.,Ltd.
Rating.....	: M5-3C-80:Input: 100-240V~, 50/60Hz, 6A Max; Output: 100-240V~, 50/60Hz, 2A/Gang 6A/Total Max, Max. load: 1320W(1-440W/Gang). M5-2C-80:Input: 100-240V~, 50/60Hz, 10A Max; Output: 100-240V~, 50/60Hz, 5A/Gang 10A/Total Max, Max. load: 2200W(1-1100W/Gang). M5-1C-80:Input: 100-240V~, 50/60Hz, 10A Max; Output: 100-240V~, 50/60Hz, 10A Max, Max. load: 2200W.

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.



The label for others model is identical to it except for model name and the rating.

Note:

- The CE marking and WEEE symbol (if any) should be at least 5.0mm and 7.0mm respectively in height.
- Manufacturers shall ensure that the equipment bears a type, batch or serial number or other element allowing its identification.
- Manufacturers shall indicate on the electrical equipment their name, registered trade name or registered trade mark and the postal address at which they can be contacted.
- Importers shall indicate on the electrical equipment their name, registered trade name or registered trade mark and the postal address at which they can be contacted.

Test item particulars:			
Product group	<input type="checkbox"/> end product	<input checked="" type="checkbox"/> built-in component	
Classification of use by	<input checked="" type="checkbox"/> Ordinary person <input checked="" type="checkbox"/> Children likely present <input type="checkbox"/> Instructed person <input type="checkbox"/> Skilled person		
Supply connection	<input checked="" type="checkbox"/> AC mains <input type="checkbox"/> DC mains <input type="checkbox"/> not mains connected: <input type="checkbox"/> ES1 <input type="checkbox"/> ES2 <input type="checkbox"/> ES3		
Supply tolerance	<input checked="" type="checkbox"/> +10%/-10% <input type="checkbox"/> +20%/-15% <input type="checkbox"/> + %/ - % <input type="checkbox"/> None		
Supply connection – type	<input type="checkbox"/> pluggable equipment type A - <input type="checkbox"/> non-detachable supply cord <input type="checkbox"/> appliance coupler <input type="checkbox"/> direct plug-in <input type="checkbox"/> pluggable equipment type B - <input type="checkbox"/> non-detachable supply cord <input type="checkbox"/> appliance coupler <input checked="" type="checkbox"/> permanent connection <input type="checkbox"/> mating connector <input type="checkbox"/> other: <u>not directly connected to the mains</u>		
Considered current rating of protective device	<input checked="" type="checkbox"/> 16 A; Location: <input checked="" type="checkbox"/> building <input type="checkbox"/> equipment <input type="checkbox"/> N/A		
Equipment mobility	<input type="checkbox"/> movable <input type="checkbox"/> hand-held <input type="checkbox"/> transportable <input type="checkbox"/> direct plug-in <input checked="" type="checkbox"/> stationary <input checked="" type="checkbox"/> for building-in <input type="checkbox"/> wall/ceiling-mounted <input type="checkbox"/> SRME/rack-mounted <input type="checkbox"/> other:		
Overvoltage category (OVC)	<input type="checkbox"/> OVC I <input checked="" type="checkbox"/> OVC II <input type="checkbox"/> OVC III <input type="checkbox"/> OVC IV <input type="checkbox"/> other: <u>not directly connected to the mains</u>		
Class of equipment	<input type="checkbox"/> Class I <input checked="" type="checkbox"/> Class II <input type="checkbox"/> Class III <input type="checkbox"/> Not classified <input type="checkbox"/>		
Special installation location	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> restricted access area <input type="checkbox"/> outdoor location <input type="checkbox"/>		
Pollution degree (PD)	<input type="checkbox"/> PD 1 <input checked="" type="checkbox"/> PD 2 <input type="checkbox"/> PD 3		
Manufacturer's specified Tma	40 °C <input type="checkbox"/> Outdoor: minimum °C		
IP protection class	<input checked="" type="checkbox"/> IPX0 <input type="checkbox"/> IP__		
Power systems	<input checked="" type="checkbox"/> TN <input type="checkbox"/> TT <input type="checkbox"/> IT - V L-L <input type="checkbox"/> not AC mains		
Altitude during operation (m)	<input checked="" type="checkbox"/> 2000 m or less <input type="checkbox"/> m		
Altitude of test laboratory (m)	<input checked="" type="checkbox"/> 2000 m or less <input type="checkbox"/> m		
Mass of equipment (kg)	M5-3C-80:0.156kg M5-2C-80:0.158kg		

Possible test case verdicts.....:

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

General remarks:

"(see remark #)" refers to a remark appended to the report.

(see appended table)" refers to a table appended to the report.

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

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

Summary of testing:

All tests were performed at the worst case and all test results complied with the standard on the cover page.

General product information:

1. The equipment named SONOFF SwitchMan Smart Wall Switch is designed as information technology equipment, for indoor use only.
2. After installation, the accessible surface has no holes
3. All primary circuits of EUT are considered as ES3 and PS3 circuits.
4. The maximum operating temperature is 40°C.
5. Before placing the products in the different countries, the manufacturer must ensure that: Operating Instructions, Ratings Labels and Warnings Labels are in an Accepted or Official Language of the country in question; The equipment complies with the National Standards and/or Electrical Codes of the country, province or city or in question.
6. The differences between the product model name of M5-3C-80, M5-2C-80, M5-1C-80, M5-1C-80W, M5-2C-80W, M5-3C-80W, M5-1C-80G, M5-2C-80G, M5-3C-80G, see the Appendix B-Declaration of similarity. All tests were performed on the model of M5-3C-80 and M5-2C-80. If no specified and all the test results also valid for the others model.

Remark:

This report No. DG1220704-29976E-SF-A1 is base on the BACL report No. DG1210901-45614E-SF.the differences see below :

1. The shell control panel becomes smaller, products are electrically identical. Small size changes on control panel have no significant impact on safety.
2. The product model is changed to M5-3C-80, M5-2C-80, M5-1C-80, M5-1C-80W, M5-2C-80W, M5-2C-80W, M5-3C-80W, M5-1C-80G, M5-2C-80G, M5-3C-80G.

Others are the same, No need added test.

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
ES3: Primary circuits	Ordinary	--	--	Transformer T1 Y-capacitor CY1, Plastic enclosure See Clause 5.4.4, 5.5.3, 5.5.4
ES1: Secondary circuits, Accessible enclosure	Ordinary	--	--	--
6	Electrically-caused fire			
Class and Energy Source (e.g. PS2: 100 Watt circuit)	Material part (e.g. Printed board)	Safeguards		
		B	1 st S	2 nd S
PS3: Primary circuits	Enclosure and PCB	See clause 6.3	See clause 6.4.6	--
PS1: Secondary circuits	Enclosure	--	--	--
7	Injury caused by hazardous substances			
Class and Energy Source (e.g. Ozone)	Body Part (e.g., Skilled)	Safeguards		
		B	S	R
--	--	--	--	--
8	Mechanically-caused injury			
Class and Energy Source (e.g. MS3: Plastic fan blades)	Body Part (e.g. Ordinary)	Safeguards		
		B	S	R
MS1: Sharp edges and corners	Ordinary	--	--	--
MS1: Equipment mass < 7kg	Ordinary	--	--	--
9	Thermal burn			
Class and Energy Source (e.g. TS1: Keyboard caps)	Body Part (e.g., Ordinary)	Safeguards		
		B	S	R
TS1: Accessible parts surface	Ordinary	--	--	--
--	--	--	--	--
10	Radiation			
Class and Energy Source (e.g. RS1: PMP sound output)	Body Part (e.g., Ordinary)	Safeguards		
		B	S	R
Exempt Group: Indicator light	Ordinary	--	--	--
Supplementary Information:				
"B" – Basic Safeguard; "S" – Supplementary Safeguard; "R" – Reinforced Safeguard				

ENERGY SOURCE DIAGRAM
<p>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.</p> <p>Insert diagram below. Example diagram designs are; Block diagrams; image(s) with layered data; mechanical drawings</p>
<p align="center">ES3, PS3, MS1, TS1 and Exempt Group for EUT</p> <p align="center"> <input checked="" type="checkbox"/> ES <input checked="" type="checkbox"/> PS <input checked="" type="checkbox"/> MS <input checked="" type="checkbox"/> TS <input checked="" type="checkbox"/> RS </p>

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
4	GENERAL REQUIREMENTS		P
4.1.1	Acceptance of materials, components and subassemblies	(See appended table 4.1.2)	P
4.1.2	Use of components	Components comply with the requirements of this standard or, where specified in a requirements clause, with the safety aspects of the relevant IEC component standards. (See appended table 4.1.2)	P
4.1.3	Equipment design and construction	Parts of equipment that could cause injury shall not be accessible, and accessible parts shall not cause an injury.	P
4.1.4	Specified ambient temperature for outdoor use (°C).....	Indoor use	N/A
4.1.5	Constructions and components not specifically covered	All solid safeguards are compliant with applicable requirements in Annex T.	N/A
4.1.8	Liquids and liquid filled components (LFC)	No such components	N/A
4.1.15	Markings and instructions	(See Annex F)	P
4.4.3	Safeguard robustness		P
4.4.3.1	General	See below	P
4.4.3.2	Steady force tests	(See Annex T.2 and T.5)	P
4.4.3.3	Drop tests		N/A
4.4.3.4	Impact tests	(See Annex T.6)	P
4.4.3.5	Internal accessible safeguard tests		N/A
4.4.3.6	Glass impact tests	No such components.	N/A
4.4.3.7	Glass fixation tests	No such components.	N/A
	Glass impact test (1J)		N/A
	Push/pull test (10 N)		N/A
4.4.3.8	Thermoplastic material tests	(See Annex T.8)	P
4.4.3.9	Air comprising a safeguard	(See Annex T)	P
4.4.3.10	Accessibility, glass, safeguard effectiveness		P
4.4.4	Displacement of a safeguard by an insulating liquid		N/A
4.4.5	Safety interlocks		N/A
4.5	Explosion		P
4.5.1	General	Tests as specified in Clause B.2, Clause B.3 and Clause B.4.	P

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.5.2	No explosion during normal/abnormal operating condition		N/A
	No harm by explosion during single fault conditions	Tests as specified in Clause B.4	P
4.6	Fixing of conductors	Class II equipment	P
	Fix conductors not to defeat a safeguard		P
	Compliance is checked by test :	Internal conductor and components.	P
4.7	Equipment for direct insertion into mains socket-outlets		N/A
4.7.2	Mains plug part complies with relevant standard :		N/A
4.7.3	Torque (Nm) :		N/A
4.8	Equipment containing coin/button cell batteries		N/A
4.8.1	General	No button battery	N/A
4.8.2	Instructional safeguard :		N/A
4.8.3	Battery compartment door/cover construction		N/A
	Open torque test		N/A
4.8.4.2	Stress relief test		N/A
4.8.4.3	Battery replacement test		N/A
4.8.4.4	Drop test		N/A
4.8.4.5	Impact test		N/A
4.8.4.6	Crush test		N/A
4.8.5	Compliance		N/A
	30N force test with test probe		N/A
	20N force test with test hook		N/A
4.9	Likelihood of fire or shock due to entry of conductive object		N/A
4.10	Component requirements		P
4.10.1	Disconnect Device	No such components	N/A
4.10.2	Switches and relays	No such switches, Relays: (See appended table 4.1.2)	P
5	Electrically-caused injury		P

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Clause	Requirement + Test		Verdict
5.2	Classification and limits of electrical energy sources		P
5.2.2	ES1, ES2 and ES3 limits	ES3	P
5.2.2.2	Steady-state voltage and current limits :	(See appended table 5.2)	P
5.2.2.3	Capacitance limits :	No such electrical energy sources	N/A
5.2.2.4	Single pulse limits :	No such electrical energy sources	N/A
5.2.2.5	Limits for repetitive pulses :	No such electrical energy sources	N/A
5.2.2.6	Ringling signals	No such electrical energy sources	N/A
5.2.2.7	Audio signals	No such electrical energy sources	N/A
5.3	Protection against electrical energy sources		P
5.3.1	General Requirements for accessible parts to ordinary, instructed and skilled persons	See only 4.3 and 5.3 to 5.5 which applies to protection between the accessible parts and hazardous parts of other circuits.	P
5.3.1 a)	Accessible ES1/ES2 derived from ES2/ES3 circuits	Transformer T1, Y-capacitor CY1, See Clause 5.4.4, 5.5.3, 5.5.4	P
5.3.1 b)	Skilled persons not unintentional contact ES3 bare conductors		N/A
5.3.2.1	Accessibility to electrical energy sources and safeguards	Only ES1 circuit can be accessed for this product.	P
	Accessibility to outdoor equipment bare parts		N/A
5.3.2.2	Contact requirements	See below	P
	Test with test probe from Annex V	No access with test probe to any ES3 circuit or parts.	-
5.3.2.2 a)	Air gap – electric strength test potential (V) :		N/A
5.3.2.2 b)	Air gap – distance (mm) :	>0.2mm	P
5.3.2.3	Compliance		P
5.3.2.4	Terminals for connecting stripped wire	No such terminals.	N/A
5.4	Insulation materials and requirements		P
5.4.1.2	Properties of insulating material	The choice and application have taken into account as specified in this Clause 5 and Annex T, and natural rubber, hygroscopic materials or asbestos are not used as insulation.	P
5.4.1.3	Material is non-hygroscopic	(See appended table 5.4.8)	P
5.4.1.4	Maximum operating temperature for insulating materials :	(See appended table 5.4.1.4)	P
5.4.1.5	Pollution degrees :	Pollution degree 2 considered	P

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.4.1.5.2	Test for pollution degree 1 environment and for an insulating compound		N/A
5.4.1.5.3	Thermal cycling test		N/A
5.4.1.6	Insulation in transformers with varying dimensions	No such transformers	N/A
5.4.1.7	Insulation in circuits generating starting pulses	No such circuit	N/A
5.4.1.8	Determination of working voltage :	(See appended table 5.4.1.8)	P
5.4.1.9	Insulating surfaces		P
5.4.1.10	Thermoplastic parts on which conductive metallic parts are directly mounted	Comply with clause 5.4.1.10.3 and See appended table 4.1.2	P
5.4.1.10.2	Vicat test :	Ball pressure tested.	N/A
5.4.1.10.3	Ball pressure test :	(See appended table 5.4.1.10.3)	P
5.4.2	Clearances	See below	P
5.4.2.1	General requirements		P
	Clearances in circuits connected to AC Mains, Alternative method		N/A
5.4.2.2	Procedure 1 for determining clearance	(See appended table 5.4.2.2)	P
	Temporary overvoltage :		—
5.4.2.3	Procedure 2 for determining clearance	(See appended table 5.4.2.2, 5.4.2.4 and 5.4.3)	P
5.4.2.3.2.2	a.c. mains transient voltage :	2500V peak considered for Overvoltage Cat. II	—
5.4.2.3.2.3	d.c. mains transient voltage :		—
5.4.2.3.2.4	External circuit transient voltage :		—
5.4.2.3.2.5	Transient voltage determined by measurement :		—
5.4.2.4	Determining the adequacy of a clearance using an electric strength test :		N/A
5.4.2.5	Multiplication factors for clearances and test voltages :	Altitude :Less than 2000m Multiplication :1.0	P
5.4.2.6	Clearance measurement :	(See appended table 5.4.2.2, 5.4.2.4 and 5.4.3)	P
5.4.3	Creepage distances	(See appended table 5.4.2.2, 5.4.2.4 and 5.4.3)	P
5.4.3.1	General		P
5.4.3.3	Material group :	Material group IIIb is assumed to be used	—
5.4.3.4	Creepage distances measurement :	(See appended table 5.4.2.2, 5.4.2.4 and 5.4.3)	P
5.4.4	Solid insulation		P

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.4.4.1	General requirements		P
5.4.4.2	Minimum distance through insulation :	(See appended table 5.4.4.2)	P
5.4.4.3	Insulating compound forming solid insulation		N/A
5.4.4.4	Solid insulation in semiconductor devices		N/A
5.4.4.5	Insulating compound forming cemented joints		N/A
5.4.4.6	Thin sheet material	(See appended table 4.1.2)	P
5.4.4.6.1	General requirements		P
5.4.4.6.2	Separable thin sheet material	Separable thin sheet material used.	P
	Number of layers (pcs) :	Min. 2 layers, Any one layer pass the electric strength test for reinforced insulation. See appended table 5.4.9	P
5.4.4.6.3	Non-separable thin sheet material		N/A
	Number of layers (pcs) :		N/A
5.4.4.6.4	Standard test procedure for non-separable thin sheet material :		N/A
5.4.4.6.5	Mandrel test		N/A
5.4.4.7	Solid insulation in wound components	(See Annex G.6)	P
5.4.4.9	Solid insulation at frequencies >30 kHz, E_p , K_R , d , V_{PW} (V) :		N/A
	Alternative by electric strength test, tested voltage (V), K_R :		N/A
5.4.5	Antenna terminal insulation		N/A
5.4.5.1	General		N/A
5.4.5.2	Voltage surge test		N/A
5.4.5.3	Insulation resistance ($M\Omega$) :		N/A
	Electric strength test :		N/A
5.4.6	Insulation of internal wire as part of supplementary safeguard	No such part used	N/A
5.4.7	Tests for semiconductor components and for cemented joints	No such part used	N/A
5.4.8	Humidity conditioning	Humidity treatment performed for 120 hrs. Electric strength test was conducted after the humidity treatment. No break down.	P
	Relative humidity (%), temperature ($^{\circ}C$), duration (h) :	93%, 40 $^{\circ}C$, 120h	—
5.4.9	Electric strength test	(See appended table 5.4.9)	P

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.4.9.1	Test procedure for type test of solid insulation :	Test voltage based on transient voltages.	P
5.4.9.2	Test procedure for routine test		N/A
5.4.10	Safeguards against transient voltages from external circuits		N/A
5.4.10.1	Parts and circuits separated from external circuits		N/A
5.4.10.2	Test methods		N/A
5.4.10.2.1	General		N/A
5.4.10.2.2	Impulse test :		N/A
5.4.10.2.3	Steady-state test :		N/A
5.4.10.3	Verification for insulation breakdown for impulse test :		N/A
5.4.11	Separation between external circuits and earth	The equipment not intended to connect to external circuits.	N/A
5.4.11.1	Exceptions to separation between external circuits and earth		N/A
5.4.11.2	Requirements		N/A
	SPDs bridge separation between external circuit and earth		N/A
	Rated operating voltage U_{op} (V) :		—
	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/A
5.4.12	Insulating liquid		N/A
5.4.12.1	General requirements		N/A
5.4.12.2	Electric strength of an insulating liquid :		N/A
5.4.12.3	Compatibility of an insulating liquid :		N/A
5.4.12.4	Container for insulating liquid :		N/A
5.5	Components as safeguards		P
5.5.1	General		P
5.5.2	Capacitors and RC units	(See appended table 4.1.2)	P
5.5.2.1	General requirement		P
5.5.2.2	Safeguards against capacitor discharge after disconnection of a connector :		N/A
5.5.3	Transformers	(See Annex G.5.3)	P

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.5.4	Optocouplers	No such components.	N/A
5.5.5	Relays	No such components.	N/A
5.5.6	Resistors	(See Clause G.10)	N/A
5.5.7	SPDs	No such components.	N/A
5.5.8	Insulation between the mains and an external circuit consisting of a coaxial cable :		N/A
5.5.9	Safeguards for socket-outlets in outdoor equipment		N/A
	RCD rated residual operating current (mA) :		—
5.6	Protective conductor		N/A
5.6.2	Requirement for protective conductors		N/A
5.6.2.1	General requirements		N/A
5.6.2.2	Colour of insulation		N/A
5.6.3	Requirement for protective earthing conductors		N/A
	Protective earthing conductor size (mm ²) :		—
	Protective earthing conductor serving as a reinforced safeguard		N/A
	Protective earthing conductor serving as a double safeguard		N/A
5.6.4	Requirements for protective bonding conductors		N/A
5.6.4.1	Protective bonding conductors		N/A
	Protective bonding conductor size (mm ²). :		—
5.6.4.2	Protective current rating (A) :		N/A
5.6.5	Terminals for protective conductors		N/A
5.6.5.1	Terminal size for connecting protective earthing conductors (mm) :		N/A
	Terminal size for connecting protective bonding conductors (mm) :		N/A
5.6.5.2	Corrosion		N/A
5.6.6	Resistance of the protective bonding system		N/A
5.6.6.1	Requirements		N/A
5.6.6.2	Test Method :		N/A
5.6.6.3	Resistance (Ω) or voltage drop :		N/A
5.6.7	Reliable connection of a protective earthing conductor		N/A
5.6.8	Functional earthing		N/A

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Conductor size (mm ²) :		N/A
	Class II with functional earthing marking :		N/A
	Appliance inlet cl & cr (mm) :		N/A
5.7	Prospective touch voltage, touch current and protective conductor current		P
5.7.2	Measuring devices and networks		P
5.7.2.1	Measurement of touch current	(See appended table 5.2)	P
5.7.2.2	Measurement of voltage		P
5.7.3	Equipment set-up, supply connections and earth connections		N/A
5.7.4	Unearthed accessible parts :		N/A
5.7.5	Earthed accessible conductive parts :		N/A
5.7.6	Requirements when touch current exceeds ES2 limits		N/A
	Protective conductor current (mA) :		N/A
	Instructional Safeguard :		N/A
5.7.7	Prospective touch voltage and touch current associated with external circuits		N/A
5.7.7.1	Touch current from coaxial cables		N/A
5.7.7.2	Prospective touch voltage and touch current associated with paired conductor cables		N/A
5.7.8	Summation of touch currents from external circuits		N/A
	a) Equipment connected to earthed external circuits, current (mA) :		N/A
	b) Equipment connected to unearthed external circuits, current (mA) :		N/A
5.8	Backfeed safeguard in battery backed up supplies		N/A
	Mains terminal ES :		N/A
	Air gap (mm) :		N/A

6	Electrically- caused fire		P
6.2	Classification of PS and PIS		P
6.2.2	Power source circuit classifications :	PS3	P
6.2.3	Classification of potential ignition sources	See below	P
6.2.3.1	Arcing PIS :	(See appended table 6.2.3.1)	P
6.2.3.2	Resistive PIS :	(See appended table 6.2.3.2)	P

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test		Verdict
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 :	No ignition, no temperature more than 300 °C	P
	Combustible materials outside fire enclosure :	No such material	N/A
6.4	Safeguards against fire under single fault conditions		P
6.4.1	Safeguard method	Method by control of fire spread applied.	P
6.4.2	Reduction of the likelihood of ignition under single fault conditions in PS1 circuits		N/A
6.4.3	Reduction of the likelihood of ignition under single fault conditions in PS2 and PS3 circuits	Method by control of fire spread applied as 6.4.1	N/A
6.4.3.1	Supplementary safeguards		N/A
6.4.3.2	Single Fault Conditions :		N/A
	Special conditions for temperature limited by fuse		N/A
6.4.4	Control of fire spread in PS1 circuits		N/A
6.4.5	Control of fire spread in PS2 circuits		N/A
6.4.5.2	Supplementary safeguards		N/A
6.4.6	Control of fire spread in PS3 circuits	V-0 or better plastic enclosure and Min. V-1 PCB used.	P
6.4.7	Separation of combustible materials from a PIS		N/A
6.4.7.2	Separation by distance		N/A
6.4.7.3	Separation by a fire barrier		N/A
6.4.8	Fire enclosures and fire barriers	See below	P
6.4.8.2	Fire enclosure and fire barrier material properties	V-0 plastic enclosure is used for the fire enclosure.	P
6.4.8.2.1	Requirements for a fire barrier	No fire barrier	N/A
6.4.8.2.2	Requirements for a fire enclosure	V-0 plastic enclosure is used for the fire enclosure.	P
6.4.8.3	Constructional requirements for a fire enclosure and a fire barrier	After installation, the accessible surface has no openings	N/A
6.4.8.3.1	Fire enclosure and fire barrier openings	No such openings	N/A
6.4.8.3.2	Fire barrier dimensions		N/A
6.4.8.3.3	Top openings and properties		N/A
	Openings dimensions (mm) :		N/A
6.4.8.3.4	Bottom openings and properties	No such openings	N/A

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Openings dimensions (mm) :		N/A
	Flammability tests for the bottom of a fire enclosure		N/A
	Instructional Safeguard :		N/A
6.4.8.3.5	Side openings and properties		N/A
	Openings dimensions (mm) :		N/A
6.4.8.3.6	Integrity of a fire enclosure, condition met: a), b) or c) :		N/A
6.4.8.4	Separation of a PIS from a fire enclosure and a fire barrier distance (mm) or flammability rating :	V-0 plastic enclosure is used for the fire enclosure.	P
6.4.9	Flammability of insulating liquid :		N/A
6.5	Internal and external wiring		N/A
6.5.1	General requirements	No such wiring.	N/A
6.5.2	Requirements for interconnection to building wiring :		N/A
6.5.3	Internal wiring size (mm ²) for socket-outlets :		N/A
6.6	Safeguards against fire due to the connection to additional equipment		N/A
7	INJURY CAUSED BY HAZARDOUS SUBSTANCES		N/A
7.2	Reduction of exposure to hazardous substances		N/A
7.3	Ozone exposure		N/A
7.4	Use of personal safeguards or personal protective equipment (PPE)		N/A
	Personal safeguards and instructions :		—
7.5	Use of instructional safeguards and instructions		N/A
	Instructional safeguard (ISO 7010) :		—
7.6	Batteries and their protection circuits		N/A
8	MECHANICALLY-CAUSED INJURY		P
8.2	Mechanical energy source classifications		P
8.3	Safeguards against mechanical energy sources		P
8.4	Safeguards against parts with sharp edges and corners		P
8.4.1	Safeguards	Only MS1, no sharp edges and corners.	P
	Instructional Safeguard :		N/A
8.4.2	Sharp edges or corners		N/A
8.5	Safeguards against moving parts		N/A

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
8.5.1	Fingers, jewellery, clothing, hair, etc., contact with MS2 or MS3 parts	No moving parts	N/A
	MS2 or MS3 part required to be accessible for the function of the equipment		N/A
	Moving MS3 parts only accessible to skilled person		N/A
8.5.2	Instructional safeguard :		N/A
8.5.4	Special categories of equipment containing moving parts		N/A
8.5.4.1	General		N/A
8.5.4.2	Equipment containing work cells with MS3 parts		N/A
8.5.4.2.1	Protection of persons in the work cell		N/A
8.5.4.2.2	Access protection override		N/A
8.5.4.2.2.1	Override system		N/A
8.5.4.2.2.2	Visual indicator		N/A
8.5.4.2.3	Emergency stop system		N/A
	Maximum stopping distance from the point of activation (m) :		N/A
	Space between end point and nearest fixed mechanical part (mm) :		N/A
8.5.4.2.4	Endurance requirements		N/A
	Mechanical system subjected to 100 000 cycles of operation		N/A
	- Mechanical function check and visual inspection		N/A
	- Cable assembly :		N/A
8.5.4.3	Equipment having electromechanical device for destruction of media		N/A
8.5.4.3.1	Equipment safeguards		N/A
8.5.4.3.2	Instructional safeguards against moving parts :		N/A
8.5.4.3.3	Disconnection from the supply		N/A
8.5.4.3.4	Cut type and test force (N) :		N/A
8.5.4.3.5	Compliance		N/A
8.5.5	High pressure lamps	No high pressure lamps	N/A
	Explosion test :		N/A
8.5.5.3	Glass particles dimensions (mm) :		N/A
8.6	Stability of equipment		N/A

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
8.6.1	General	Equipment mass < 7kg, MS1	N/A
	Instructional safeguard :		N/A
8.6.2	Static stability		N/A
8.6.2.2	Static stability test :		N/A
8.6.2.3	Downward force test		N/A
8.6.3	Relocation stability		N/A
	Wheels diameter (mm) :		—
	Tilt test		N/A
8.6.4	Glass slide test		N/A
8.6.5	Horizontal force test :		N/A
8.7	Equipment mounted to wall, ceiling or other structure		N/A
8.7.1	Mount means type :		N/A
8.7.2	Test methods		N/A
	Test 1, additional downwards force (N) :		N/A
	Test 2, number of attachment points and test force (N) :		N/A
	Test 3 Nominal diameter (mm) and applied torque (Nm) :		N/A
8.8	Handles strength		N/A
8.8.1	General		N/A
8.8.2	Handle strength test		N/A
	Number of handles :		—
	Force applied (N) :		—
8.9	Wheels or casters attachment requirements		N/A
8.9.2	Pull test		N/A
8.10	Carts, stands and similar carriers		N/A
8.10.1	General		N/A
8.10.2	Marking and instructions :		N/A
8.10.3	Cart, stand or carrier loading test		N/A
	Loading force applied (N) :		N/A
8.10.4	Cart, stand or carrier impact test		N/A
8.10.5	Mechanical stability		N/A
	Force applied (N) :		—
8.10.6	Thermoplastic temperature stability		N/A

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

8.11	Mounting means for slide-rail mounted equipment (SRME)		N/A
8.11.1	General		N/A
8.11.2	Requirements for slide rails		N/A
	Instructional Safeguard :		N/A
8.11.3	Mechanical strength test		N/A
8.11.3.1	Downward force test, force (N) applied :		N/A
8.11.3.2	Lateral push force test		N/A
8.11.3.3	Integrity of slide rail end stops		N/A
8.11.4	Compliance		N/A
8.12	Telescoping or rod antennas		N/A
	Button/ball diameter (mm) :		—

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 9.3)	P
9.3.2	Test method and compliance		P
9.4	Safeguards against thermal energy sources		N/A
9.5	Requirements for safeguards		N/A
9.5.1	Equipment safeguard		N/A
9.5.2	Instructional safeguard :		N/A
9.6	Requirements for wireless power transmitters		N/A
9.6.1	General		N/A
9.6.2	Specification of the foreign objects		N/A
9.6.3	Test method and compliance :		N/A

10	RADIATION		P
10.2	Radiation energy source classification		P
10.2.1	General classification	Indicator light : Exempt Group	P
	Lasers :		—
	Lamps and lamp systems :		—
	Image projectors :		—
	X-Ray :		—
	Personal music player :		—

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test		Verdict
10.3	Safeguards against laser radiation		N/A
	The standard(s) equipment containing laser(s) comply :		N/A
10.4	Safeguards against optical radiation from lamps and lamp systems (including LED types)		N/A
10.4.1	General requirements	Indicating LED is used, no need safeguard	N/A
	Instructional safeguard provided for accessible radiation level needs to exceed		N/A
	Risk group marking and location :		N/A
	Information for safe operation and installation		N/A
10.4.2	Requirements for enclosures		N/A
	UV radiation exposure :		N/A
10.4.3	Instructional safeguard :		N/A
10.5	Safeguards against X-radiation		N/A
10.5.1	Requirements		N/A
	Instructional safeguard for skilled persons :		—
10.5.3	Maximum radiation (pA/kg) :		—
10.6	Safeguards against acoustic energy sources		N/A
10.6.1	General		N/A
10.6.2	Classification		N/A
	Acoustic output $L_{Aeq,T}$ dB(A) :		N/A
	Unweighted RMS output voltage (mV) :		N/A
	Digital output signal (dBFS) :		N/A
10.6.3	Requirements for dose-based systems		N/A
10.6.3.1	General requirements		N/A
10.6.3.2	Dose-based warning and automatic decrease		N/A
10.6.3.3	Exposure-based warning and requirements		N/A
	30 s integrated exposure level (MEL30) :		N/A
	Warning for MEL ≥ 100 dB(A) :		N/A
10.6.4	Measurement methods		N/A
10.6.5	Protection of persons		N/A
	Instructional safeguards :		N/A
10.6.6	Requirements for listening devices (headphones, earphones, etc.)		N/A
10.6.6.1	Corded listening devices with analogue input		N/A


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

	Listening device input voltage (mV) :		N/A
10.6.6.2	Corded listening devices with digital input		N/A
	Max. acoustic output $L_{Aeq,T}$, dB(A) :		N/A
10.6.6.3	Cordless listening devices		N/A
	Max. acoustic output $L_{Aeq,T}$, dB(A) :		N/A

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		P
B.2	Normal operating conditions		P
B.2.1	General requirements :	(See Test Item Particulars and appended test tables)	P
	Audio Amplifiers and equipment with audio amplifiers :		N/A
B.2.3	Supply voltage and tolerances	100-240V~, ±10%	P
B.2.5	Input test :	(See appended table B.2.5)	P
B.3	Simulated abnormal operating conditions		P
B.3.1	General	(See appended table B.3)	P
B.3.2	Covering of ventilation openings	(See appended table B.3)	P
	Instructional safeguard :		N/A
B.3.3	DC mains polarity test	Not connected to D.C. mains	N/A
B.3.4	Setting of voltage selector	No such components	N/A
B.3.5	Maximum load at output terminals	The output is equal to the input of AC mains. No need test.	N/A
B.3.6	Reverse battery polarity	No battery	N/A
B.3.7	Audio amplifier abnormal operating conditions	No audio amplifier	N/A
B.3.8	Safeguards functional during and after abnormal operating conditions :	(See appended table B.3)	P
B.4	Simulated single fault conditions		P
B.4.1	General		P
B.4.2	Temperature controlling device	No such components	N/A
B.4.3	Blocked motor test	No such components	N/A
B.4.4	Functional insulation		P
B.4.4.1	Short circuit of clearances for functional insulation	The functional insulation was short-circuited. (See appended table B.4)	P

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
B.4.4.2	Short circuit of creepage distances for functional insulation	The functional insulation was short-circuited. (See appended table B.4)	P
B.4.4.3	Short circuit of functional insulation on coated printed boards		N/A
B.4.5	Short-circuit and interruption of electrodes in tubes and semiconductors	(See appended table B.4)	P
B.4.6	Short circuit or disconnection of passive components	(See appended table B.4)	P
B.4.7	Continuous operation of components	No component intended for short-time operation or intermittent operation.	N/A
B.4.8	Compliance during and after single fault conditions :	Enclosure limited to TS1 during and after single fault conditions. Accessible output terminal limited to ES1 and TS1 during and after single fault conditions. No flame during and after single fault condition. (See appended table B.4)	P
B.4.9	Battery charging and discharging under single fault conditions		N/A
C	UV RADIATION		N/A
C.1	Protection of materials in equipment from UV radiation		N/A
C.1.2	Requirements	No UV radiation	N/A
C.1.3	Test method		N/A
C.2	UV light conditioning test		N/A
C.2.1	Test apparatus :		N/A
C.2.2	Mounting of test samples		N/A
C.2.3	Carbon-arc light-exposure test		N/A
C.2.4	Xenon-arc light-exposure test		N/A
D	TEST GENERATORS		N/A
D.1	Impulse test generators		N/A
D.2	Antenna interface test generator		N/A
D.3	Electronic pulse generator		N/A
E	TEST CONDITIONS FOR EQUIPMENT CONTAINING AUDIO AMPLIFIERS		N/A
E.1	Electrical energy source classification for audio signals		N/A
	Maximum non-clipped output power (W) :	No such components.	—

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test		Verdict
	Rated load impedance (Ω) :		—
	Open-circuit output voltage (V) :		—
	Instructional safeguard :		—
E.2	Audio amplifier normal operating conditions		N/A
	Audio signal source type :	No such components.	—
	Audio output power (W) :		—
	Audio output voltage (V):		—
	Rated load impedance (Ω) :		—
	Requirements for temperature measurement		N/A
E.3	Audio amplifier abnormal operating conditions		N/A
F	EQUIPMENT MARKINGS, INSTRUCTIONS, AND INSTRUCTIONAL SAFEGUARDS		P
F.1	General		P
	Language :	English version evaluated	—
F.2	Letter symbols and graphical symbols		P
F.2.1	Letter symbols according to IEC60027-1	Complied	P
F.2.2	Graphic symbols according to IEC, ISO or manufacturer specific	Complied	P
F.3	Equipment markings		P
F.3.1	Equipment marking locations	Outside of enclosure, visual	P
F.3.2	Equipment identification markings	See below	P
F.3.2.1	Manufacturer identification :	See copy of marking plate	P
F.3.2.2	Model identification :	See copy of marking plate	P
F.3.3	Equipment rating markings	See below	P
F.3.3.1	Equipment with direct connection to mains		P
F.3.3.2	Equipment without direct connection to mains		N/A
F.3.3.3	Nature of the supply voltage :	~	P
F.3.3.4	Rated voltage :	100-240V	P
F.3.3.5	Rated frequency :	50/60Hz	P
F.3.3.6	Rated current or rated power :	See copy of marking plate	P
F.3.3.7	Equipment with multiple supply connections	See copy of marking plate	P
F.3.4	Voltage setting device	No voltage setting device	N/A
F.3.5	Terminals and operating devices		P
F.3.5.1	Mains appliance outlet and socket-outlet markings :		N/A

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
F.3.5.2	Switch position identification marking :		N/A
F.3.5.3	Replacement fuse identification and rating markings :	Fuse resistor is not intended to be replaceable.	N/A
	Instructional safeguards for neutral fuse :		N/A
F.3.5.4	Replacement battery identification marking :		N/A
F.3.5.5	Neutral conductor terminal		N/A
F.3.5.6	Terminal marking location		N/A
F.3.6	Equipment markings related to equipment classification	Class II equipment	P
F.3.6.1	Class I equipment		N/A
F.3.6.1.1	Protective earthing conductor terminal :		N/A
F.3.6.1.2	Protective bonding conductor terminals :		N/A
F.3.6.2	Equipment class marking :	 Marked on the product label	P
F.3.6.3	Functional earthing terminal marking :		N/A
F.3.7	Equipment IP rating marking :	IPX0	N/A
F.3.8	External power supply output marking :		N/A
F.3.9	Durability, legibility and permanence of marking	The markings on the equipment is durable and legible, and shall be easily discernable under normal lighting conditions	P
F.3.10	Test for permanence of markings	Rubbing the marking by hand for 15 s with piece of cloth soaked with water, and for 15 s with a piece of cloth soaked with petroleum spirit at a different place .after this test, marking is legible and cannot be easily possible to remove marking and show no curling	P
F.4	Instructions		P
	a) Information prior to installation and initial use		P
	b) Equipment for use in locations where children not likely to be present		N/A
	c) Instructions for installation and interconnection		P
	d) Equipment intended for use only in restricted access area		N/A
	e) Equipment intended to be fastened in place		N/A
	f) Instructions for audio equipment terminals		N/A

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test		Verdict
	g) Protective earthing used as a safeguard		N/A
	h) Protective conductor current exceeding ES2 limits		N/A
	i) Graphic symbols used on equipment		P
	j) Permanently connected equipment not provided with all-pole mains switch		N/A
	k) Replaceable components or modules providing safeguard function		N/A
	l) Equipment containing insulating liquid		N/A
	m) Installation instructions for outdoor equipment		N/A
F.5	Instructional safeguards		P
G	COMPONENTS		P
G.1	Switches		N/A
G.1.1	General	No such components	N/A
G.1.2	Ratings, endurance, spacing, maximum load		N/A
G.1.3	Test method and compliance		N/A
G.2	Relays		P
G.2.1	Requirements	Approved relay used (See appended table 4.1.2)	P
G.2.2	Overload test		N/A
G.2.3	Relay controlling connectors supplying power to other equipment		N/A
G.2.4	Test method and compliance		N/A
G.3	Protective devices		P
G.3.1	Thermal cut-offs	No such components	N/A
	Thermal cut-outs separately approved according to IEC 60730 with conditions indicated in a) & b)		N/A
	Thermal cut-outs tested as part of the equipment as indicated in c)		N/A
G.3.1.2	Test method and compliance		N/A
G.3.2	Thermal links		N/A
G.3.2.1	a) Thermal links tested separately according to IEC 60691 with specifics		N/A
	b) Thermal links tested as part of the equipment		N/A
G.3.2.2	Test method and compliance		N/A
G.3.3	PTC thermistors		N/A

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
G.3.4	Overcurrent protection devices		N/A
G.3.5	Safeguards components not mentioned in G.3.1 to G.3.4		P
G.3.5.1	Non-resettable devices suitably rated and marking provided	Fuse resistor is not intended to be replaceable.	N/A
G.3.5.2	Single faults conditions :	(See appended table B.4)	P
G.4	Connectors		P
G.4.1	Spacings		P
G.4.2	Mains connector configuration :		P
G.4.3	Plug is shaped that insertion into mains socket-outlets or appliance coupler is unlikely		P
G.5	Wound components		P
G.5.1	Wire insulation in wound components	Approved Triple insulation wires (TIW) used for secondary winding of transformer.	P
G.5.1.2	Protection against mechanical stress	Physical separation is provided.	P
G.5.2	Endurance test		N/A
G.5.2.1	General test requirements		N/A
G.5.2.2	Heat run test		N/A
	Test time (days per cycle) :		—
	Test temperature (°C) :		—
G.5.2.3	Wound components supplied from the mains		N/A
G.5.2.4	No insulation breakdown		N/A
G.5.3	Transformers		P
G.5.3.1	Compliance method :	Comply with the requirements as below	P
	Position:	T1	P
	Method of protection :	See G.5.3.3	P
G.5.3.2	Insulation	Primary windings and secondary windings are separated by Reinforced insulation. (The core is considered as primary part as it is not isolated from Primary)	P
	Protection from displacement of windings :	Fixed by bobbin and insulation tape	—
G.5.3.3	Transformer overload tests	See below	P
G.5.3.3.1	Test conditions	(See append table B.3 and B.4)	P

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
G.5.3.3.2	Winding temperatures	(See append table B.3 and B.4)	P
G.5.3.3.3	Winding temperatures - alternative test method		N/A
G.5.3.4	Transformers using FIW		N/A
G.5.3.4.1	General		N/A
	FIW wire nominal diameter :		—
G.5.3.4.2	Transformers with basic insulation only		N/A
G.5.3.4.3	Transformers with double insulation or reinforced insulation :		N/A
G.5.3.4.4	Transformers with FIW wound on metal or ferrite core		N/A
G.5.3.4.5	Thermal cycling test and compliance		N/A
G.5.3.4.6	Partial discharge test		N/A
G.5.3.4.7	Routine test		N/A
G.5.4	Motors	No such components	N/A
G.5.4.1	General requirements		N/A
G.5.4.2	Motor overload test conditions		N/A
G.5.4.3	Running overload test		N/A
G.5.4.4.2	Locked-rotor overload test		N/A
	Test duration (days) :		—
G.5.4.5	Running overload test for DC motors		N/A
G.5.4.5.2	Tested in the unit		N/A
G.5.4.5.3	Alternative method		N/A
G.5.4.6	Locked-rotor overload test for DC motors		N/A
G.5.4.6.2	Tested in the unit		N/A
	Maximum Temperature :		N/A
G.5.4.6.3	Alternative method		N/A
G.5.4.7	Motors with capacitors		N/A
G.5.4.8	Three-phase motors		N/A
G.5.4.9	Series motors		N/A
	Operating voltage :		—
G.6	Wire Insulation		P
G.6.1	General	Triple insulated winding in T1 secondary windings used as reinforced safeguard in the isolating transformer that has separately complied with Annex J.	P

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
G.6.2	Enamelled winding wire insulation		P
G.7	Mains supply cords		N/A
G.7.1	General requirements		N/A
	Type :		—
G.7.2	Cross sectional area (mm ² or AWG) :		N/A
G.7.3	Cord anchorages and strain relief for non-detachable power supply cords		N/A
G.7.3.2	Cord strain relief		N/A
G.7.3.2.1	Requirements		N/A
	Strain relief test force (N) :		N/A
G.7.3.2.2	Strain relief mechanism failure		N/A
G.7.3.2.3	Cord sheath or jacket position, distance (mm) :		N/A
G.7.3.2.4	Strain relief and cord anchorage material		N/A
G.7.4	Cord Entry		N/A
G.7.5	Non-detachable cord bend protection		N/A
G.7.5.1	Requirements		N/A
G.7.5.2	Test method and compliance		N/A
	Overall diameter or minor overall dimension, <i>D</i> (mm) :		—
	Radius of curvature after test (mm) :		—
G.7.6	Supply wiring space		N/A
G.7.6.1	General requirements		N/A
G.7.6.2	Stranded wire		N/A
G.7.6.2.1	Requirements		N/A
G.7.6.2.2	Test with 8 mm strand		N/A
G.8	Varistors		P
G.8.1	General requirements	Approved varistor used. See appended table 4.1.2	P
G.8.2	Safeguards against fire		N/A
G.8.2.1	General		N/A
G.8.2.2	Varistor overload test		N/A
G.8.2.3	Temporary overvoltage test		N/A
G.9	Integrated circuit (IC) current limiters		N/A
G.9.1	Requirements	No such components	N/A
	IC limiter output current (max. 5A) :		—

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Manufacturers' defined drift :		—
G.9.2	Test Program		N/A
G.9.3	Compliance		N/A
G.10	Resistors		N/A
G.10.1	General	Fuse resistor used.	N/A
G.10.2	Conditioning		N/A
G.10.3	Resistor test		N/A
G.10.4	Voltage surge test		N/A
G.10.5	Impulse test		N/A
G.10.6	Overload test		N/A
G.11	Capacitors and RC units		P
G.11.1	General requirements	See below	P
G.11.2	Conditioning of capacitors and RC units	(See appended table 4.1.2)	P
G.11.3	Rules for selecting capacitors	Capacitors comply with IEC 60384-14 (See appended table 4.1.2)	P
G.12	Optocouplers		N/A
	Optocouplers comply with IEC 60747-5-5 with specifics	No such components	N/A
	Type test voltage $V_{ini,a}$:		—
	Routine test voltage, $V_{ini,b}$:		—
G.13	Printed boards		P
G.13.1	General requirements	(See appended table 4.1.2)	P
G.13.2	Uncoated printed boards		P
G.13.3	Coated printed boards		N/A
G.13.4	Insulation between conductors on the same inner surface		N/A
G.13.5	Insulation between conductors on different surfaces		N/A
	Distance through insulation :		N/A
	Number of insulation layers (pcs) :		—
G.13.6	Tests on coated printed boards		N/A
G.13.6.1	Sample preparation and preliminary inspection		N/A
G.13.6.2	Test method and compliance		N/A
G.14	Coating on components terminals		N/A
G.14.1	Requirements :	No such components	N/A

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test		Verdict
G.15	Pressurized liquid filled components		N/A
G.15.1	Requirements	No such components	N/A
G.15.2	Test methods and compliance		N/A
G.15.2.1	Hydrostatic pressure test		N/A
G.15.2.2	Creep resistance test		N/A
G.15.2.3	Tubing and fittings compatibility test		N/A
G.15.2.4	Vibration test		N/A
G.15.2.5	Thermal cycling test		N/A
G.15.2.6	Force test		N/A
G.15.3	Compliance		N/A
G.16	IC including capacitor discharge function (ICX)		N/A
G.16.1	Condition for fault tested is not required	No such components	N/A
	ICX with associated circuitry tested in equipment		N/A
	ICX tested separately		N/A
G.16.2	Tests		N/A
	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 :		—
G.16.3	Capacitor discharge test:		N/A
H	CRITERIA FOR TELEPHONE RINGING SIGNALS		N/A
H.1	General		N/A
H.2	Method A		N/A
H.3	Method B		N/A
H.3.1	Ringing signal	No ringing signals	N/A
H.3.1.1	Frequency (Hz) :		—
H.3.1.2	Voltage (V) :		—
H.3.1.3	Cadence; time (s) and voltage (V) :		—
H.3.1.4	Single fault current (mA): :		—
H.3.2	Tripping device and monitoring voltage		N/A
H.3.2.1	Conditions for use of a tripping device or a monitoring voltage		N/A
H.3.2.2	Tripping device		N/A

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test		Verdict
H.3.2.3	Monitoring voltage (V) :		N/A
J	INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION		P
J.1	General		P
	Winding wire insulation :	Approved triple insulated wire used. See appended table 4.1.2.	—
	Solid round winding wire, diameter (mm):		N/A
	Solid square and rectangular (flatwise bending) winding wire, cross-sectional area (mm ²):		N/A
J.2/J.3	Tests and Manufacturing	(See separate test report)	—
K	SAFETY INTERLOCKS		N/A
K.1	General requirements		N/A
	Instructional safeguard :	No such components	N/A
K.2	Components of safety interlock safeguard mechanism		N/A
K.3	Inadvertent change of operating mode		N/A
K.4	Interlock safeguard override		N/A
K.5	Fail-safe		N/A
K.5.1	Under single fault condition		N/A
K.6	Mechanically operated safety interlocks		N/A
K.6.1	Endurance requirement		N/A
K.6.2	Test method and compliance :		N/A
K.7	Interlock circuit isolation		N/A
K.7.1	Separation distance for contact gaps & interlock circuit elements		N/A
	In circuit connected to mains, separation distance for contact gaps (mm) :		N/A
	In circuit isolated from mains, separation distance for contact gaps (mm) :		N/A
	Electric strength test before and after the test of K.7.2 :		N/A
K.7.2	Overload test, Current (A) :		N/A
K.7.3	Endurance test		N/A
K.7.4	Electric strength test		N/A
L	DISCONNECT DEVICES		N/A
L.1	General requirements		N/A
L.2	Permanently connected equipment		N/A

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
L.3	Parts that remain energized		N/A
L.4	Single-phase equipment		N/A
L.5	Three-phase equipment		N/A
L.6	Switches as disconnect devices		N/A
L.7	Plugs as disconnect devices		N/A
L.8	Multiple power sources		N/A
	Instructional safeguard :		N/A
M	EQUIPMENT CONTAINING BATTERIES AND THEIR PROTECTION CIRCUITS		N/A
M.1	General requirements		N/A
M.2	Safety of batteries and their cells		N/A
M.2.1	Batteries and their cells comply with relevant IEC standards :		N/A
M.3	Protection circuits for batteries provided within the equipment		N/A
M.3.1	Requirements		N/A
M.3.2	Test method		N/A
	Overcharging of a rechargeable battery		N/A
	Excessive discharging		N/A
	Unintentional charging of a non-rechargeable battery		N/A
	Reverse charging of a rechargeable battery		N/A
M.3.3	Compliance		N/A
M.4	Additional safeguards for equipment containing a portable secondary lithium battery		N/A
M.4.1	General		N/A
M.4.2	Charging safeguards		N/A
M.4.2.1	Requirements		N/A
M.4.2.2	Compliance :		N/A
M.4.3	Fire enclosure :		N/A
M.4.4	Drop test of equipment containing a secondary lithium battery		N/A
M.4.4.2	Preparation and procedure for the drop test		N/A
M.4.4.3	Drop, Voltage on reference and dropped batteries (V); voltage difference during 24 h period (%): :		N/A
M.4.4.4	Check of the charge/discharge function		N/A
M.4.4.5	Charge / discharge cycle test		N/A

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
M.4.4.6	Compliance		N/A
M.5	Risk of burn due to short-circuit during carrying		N/A
M.5.1	Requirement		N/A
M.5.2	Test method and compliance		N/A
M.6	Safeguards against short-circuits		N/A
M.6.1	External and internal faults		N/A
M.6.2	Compliance		N/A
M.7	Risk of explosion from lead acid and NiCd batteries		N/A
M.7.1	Ventilation preventing explosive gas concentration		N/A
	Calculated hydrogen generation rate :		N/A
M.7.2	Test method and compliance		N/A
	Minimum air flow rate, Q (m ³ /h) :		N/A
M.7.3	Ventilation tests		N/A
M.7.3.1	General		N/A
M.7.3.2	Ventilation test – alternative 1		N/A
	Hydrogen gas concentration (%):		N/A
M.7.3.3	Ventilation test – alternative 2		N/A
	Obtained hydrogen generation rate :		N/A
M.7.3.4	Ventilation test – alternative 3		N/A
	Hydrogen gas concentration (%):		N/A
M.7.4	Marking:		N/A
M.8	Protection against internal ignition from external spark sources of batteries with aqueous electrolyte		N/A
M.8.1	General		N/A
M.8.2	Test method		N/A
M.8.2.1	General		N/A
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/A
M.9.1	Protection from electrolyte spillage		N/A
M.9.2	Tray for preventing electrolyte spillage		N/A
M.10	Instructions to prevent reasonably foreseeable misuse		N/A

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Instructional safeguard :		N/A
N	ELECTROCHEMICAL POTENTIALS		N/A
	Material(s) used:		—
O	MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES		P
	Value of X (mm) :		—
P	SAFEGUARDS AGAINST CONDUCTIVE OBJECTS		N/A
P.1	General	After installation, the accessible surface has no openings	N/A
P.2	Safeguards against entry or consequences of entry of a foreign object		N/A
P.2.1	General		N/A
P.2.2	Safeguards against entry of a foreign object		N/A
	Location and Dimensions (mm) :		—
P.2.3	Safeguards against the consequences of entry of a foreign object		N/A
P.2.3.1	Safeguard requirements		N/A
	The ES3 and PS3 keep-out volume in Figure P.3 not applicable to transportable equipment		N/A
	Transportable equipment with metalized plastic parts :		N/A
P.2.3.2	Consequence of entry test :		N/A
P.3	Safeguards against spillage of internal liquids		N/A
P.3.1	General		N/A
P.3.2	Determination of spillage consequences		N/A
P.3.3	Spillage safeguards		N/A
P.3.4	Compliance		N/A
P.4	Metallized coatings and adhesives securing parts		N/A
P.4.1	General		N/A
P.4.2	Tests		N/A
	Conditioning, T _C (°C) :		—
	Duration (weeks) :		—
Q	CIRCUITS INTENDED FOR INTERCONNECTION WITH BUILDING WIRING		N/A
Q.1	Limited power sources		N/A
Q.1.1	Requirements		N/A
	a) Inherently limited output		N/A
	b) Impedance limited output		N/A

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	c) Regulating network limited output		N/A
	d) Overcurrent protective device limited output		N/A
	e) IC current limiter complying with G.9		N/A
Q.1.2	Test method and compliance :	(See appended table Q.1)	N/A
	Current rating of overcurrent protective device (A) :		N/A
Q.2	Test for external circuits – paired conductor cable		N/A
	Maximum output current (A) :		N/A
	Current limiting method :		—
R	LIMITED SHORT CIRCUIT TEST		N/A
R.1	General		N/A
R.2	Test setup		N/A
	Overcurrent protective device for test :		—
R.3	Test method		N/A
	Cord/cable used for test :		—
R.4	Compliance		N/A
S	TESTS FOR RESISTANCE TO HEAT AND FIRE		N/A
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/A
	Samples, material :		—
	Wall thickness (mm) :		—
	Conditioning (°C) :		—
	Test flame according to IEC 60695-11-5 with conditions as set out		N/A
	- Material not consumed completely		N/A
	- Material extinguishes within 30s		N/A
	- No burning of layer or wrapping tissue		N/A
S.2	Flammability test for fire enclosure and fire barrier integrity		N/A
	Samples, material :		—
	Wall thickness (mm) :		—
	Conditioning (°C) :		—
S.3	Flammability test for the bottom of a fire enclosure		N/A
S.3.1	Mounting of samples		N/A
S.3.2	Test method and compliance		N/A

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test		Verdict
	Mounting of samples :		—
	Wall thickness (mm) :		—
S.4	Flammability classification of materials		N/A
S.5	Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power exceeding 4 000 W		N/A
	Samples, material :		—
	Wall thickness (mm) :		—
	Conditioning (°C) :		—
T	MECHANICAL STRENGTH TESTS		P
T.1	General		P
T.2	Steady force test, 10 N :	(See appended table Annex T.2)	P
T.3	Steady force test, 30 N :		N/A
T.4	Steady force test, 100 N :		N/A
T.5	Steady force test, 250 N :	(See appended table Annex T.5)	P
T.6	Enclosure impact test	(See appended table T.6)	P
	Fall test		P
	Swing test		P
T.7	Drop test :		N/A
T.8	Stress relief test :	(See appended table Annex T.8)	P
T.9	Glass Impact Test :		N/A
T.10	Glass fragmentation test		N/A
	Number of particles counted :		N/A
T.11	Test for telescoping or rod antennas		N/A
	Torque value (Nm) :		N/A
U	MECHANICAL STRENGTH OF CATHODE RAY TUBES (CRT) AND PROTECTION AGAINST THE EFFECTS OF IMPLOSION		N/A
U.1	General		N/A
	Instructional safeguard :		N/A
U.2	Test method and compliance for non-intrinsically protected CRTs		N/A
U.3	Protective screen		N/A
V	DETERMINATION OF ACCESSIBLE PARTS		P
V.1	Accessible parts of equipment		P
V.1.1	General	Only touched the ES1 circuits	P
V.1.2	Surfaces and openings tested with jointed test		P

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	probes		
V.1.3	Openings tested with straight unjointed test probes		N/A
V.1.4	Plugs, jacks, connectors tested with blunt probe		N/A
V.1.5	Slot openings tested with wedge probe		N/A
V.1.6	Terminals tested with rigid test wire		N/A
V.2	Accessible part criterion		P
X	ALTERNATIVE METHOD FOR DETERMINING CLEARANCES FOR INSULATION IN CIRCUITS CONNECTED TO AN AC MAINS NOT EXCEEDING 420 V PEAK (300 V RMS)		N/A
	Clearance :		N/A
Y	CONSTRUCTION REQUIREMENTS FOR OUTDOOR ENCLOSURES		N/A
Y.1	General		N/A
Y.2	Resistance to UV radiation		N/A
Y.3	Resistance to corrosion		N/A
Y.3	Resistance to corrosion		N/A
Y.3.1	Metallic parts of outdoor enclosures are resistant to effects of water-borne contaminants by :		N/A
Y.3.2	Test apparatus		N/A
Y.3.3	Water – saturated sulphur dioxide atmosphere		N/A
Y.3.4	Test procedure :		N/A
Y.3.5	Compliance		N/A
Y.4	Gaskets		N/A
Y.4.1	General		N/A
Y.4.2	Gasket tests		N/A
Y.4.3	Tensile strength and elongation tests		N/A
	Alternative test methods:		N/A
Y.4.4	Compression test		N/A
Y.4.5	Oil resistance		N/A
Y.4.6	Securing means		N/A
Y.5	Protection of equipment within an outdoor enclosure		N/A
Y.5.1	General		N/A
Y.5.2	Protection from moisture		N/A
	Relevant tests of IEC 60529 or Y.5.3 :		N/A
Y.5.3	Water spray test		N/A
Y.5.4	Protection from plants and vermin		N/A

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
Y.5.5	Protection from excessive dust		N/A
Y.5.5.1	General		N/A
Y.5.5.2	IP5X equipment		N/A
Y.5.5.3	IP6X equipment		N/A
Y.6	Mechanical strength of enclosures		N/A
Y.6.1	General		N/A
Y.6.2	Impact test :		N/A

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

IEC62368_1E - ATTACHMENT			
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 62368-1:2020+A11:2020			
Attachment Form No.....: EU_GD_IEC62368_1E			
Attachment Originator UL(Demko)			
Master Attachment 2021-02-04			
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	CENELEC COMMON MODIFICATIONS (EN)		P
	Clause numbers in the cells that are shaded light grey are clause references in EN IEC 62368-1:2020+A11:2020. All other clause numbers in that column, except for those in the paragraph below, refers to IEC 62368-1:2018. Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 62368-1:2018 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 Clause 3 .		N/A
3.3.19	Sound exposure Replace 3.3.19 of IEC 62368-1 with the following definitions:		N/A



EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
3.3.19.1	<p>momentary exposure level, MEL</p> <p>metric for estimating 1 s sound exposure level from the HD 483-1 S2 test signal applied to both channels, based on EN 50332-1:2013, 4.2.</p> <p>Note 1 to entry: MEL is measured as A-weighted levels in dB.</p> <p>Note 2 to entry: See B.3 of EN 50332-3:2017 for additional information.</p>		N/A
3.3.19.3	<p>sound exposure, E</p> <p>A-weighted sound pressure (p) squared and integrated over a stated period of time, T</p> <p>Note 1 to entry: The SI unit is $\text{Pa}^2 \text{ s}$.</p> $E = \int_0^T p(t)^2 dt$		N/A
3.3.19.4	<p>sound exposure level, SEL</p> <p>logarithmic measure of sound exposure relative to a reference value, E_0, typically the 1 kHz threshold of hearing in humans.</p> <p>Note 1 to entry: SEL is measured as A-weighted levels in dB.</p> <p>#</p> $SEL = 10 \lg \left(\frac{E}{E_0} \right) \text{ dB}$ <p>#</p> <p>Note 2 to entry: See B.4 of EN 50332-3:2017 for additional information.</p>		N/A
3.3.19.5	<p>digital signal level relative to full scale, dBFS</p> <p>levels reported in dBFS are always r.m.s. Full scale level, 0 dBFS, is the level of a dc-free 997-Hz sine wave whose undithered positive peak value is positive digital full scale, leaving the code corresponding to negative digital full scale unused</p> <p>Note 1 to entry: It is invalid to use dBFS for non-r.m.s. levels. Because the definition of full scale is based on a sine wave, the level of signals with a crest factor lower than that of a sine wave may exceed 0 dBFS. In particular, square wave signals may reach +3,01 dBFS.</p>		N/A
2	Modification to Clause 10		N/A
10.6	<p>Safeguards against acoustic energy sources</p> <p>Replace 10.6 of IEC 62368-1 with the following:</p>		N/A
10.6.1.1	<p>Introduction</p> <p>Safeguard requirements for protection against</p>		N/A

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>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:</p> <ul style="list-style-type: none"> – 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.). <p>EXAMPLES Portable CD players, MP3 audio players, mobile phones with MP3 type features, PDAs or similar equipment.</p> <p>Personal music players shall comply with the requirements of either 10.6.2 or 10.6.3.</p> <p>NOTE 1 Protection against acoustic energy sources from telecom applications is referenced to ITU-T P.360.</p> <p>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.</p> <p>Listening devices sold separately shall comply with the requirements of 10.6.6.</p> <p>These requirements are valid for music or video mode only.</p> <p>The requirements do not apply to:</p> <ul style="list-style-type: none"> – professional equipment; <p>NOTE 3 Professional equipment is equipment sold through special sales channels. All products sold through normal electronics stores are considered not to be professional equipment.</p> <ul style="list-style-type: none"> – hearing aid equipment and other devices for assistive listening; – the following type of analogue personal music players: <ul style="list-style-type: none"> • long distance radio receiver (for example, a multiband radio receiver or world band radio receiver, an AM radio receiver), and • cassette player/recorder; <p>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</p>		

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>be extended to other technologies.</p> <p>– a player while connected to an external amplifier that does not allow the user to walk around while in use.</p> <p>For equipment that is clearly designed or intended primarily for use by children, the limits of the relevant toy standards may apply.</p> <p>The relevant requirements are given in EN 71-1:2011, 4.20 and the related tests methods and measurement distances apply.</p>		
10.6.1.2	<p>Non-ionizing radiation from radio frequencies in the range 0 to 300 GHz</p> <p>The amount of non-ionizing radiation is regulated by European Council Recommendation 1999/519/EC of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz). For intentional radiators, ICNIRP guidelines should be taken into account for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300 GHz). For hand-held and body mounted devices, attention is drawn to EN 50360 and EN 50566.</p>		N/A
10.6.2	Classification of devices without the capacity to estimate sound dose		N/A
10.6.2.1	<p>General</p> <p>This standard is transitioning from short-term based (30 s) requirements to long-term based (40 hour) requirements. These clauses remain in effect only for devices that do not comply with sound dose estimation as stipulated in EN 50332-3.</p> <p>For classifying the acoustic output $L_{Aeq,T}$, measurements are based on the A-weighted equivalent sound pressure level over a 30 s period.</p> <p>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.</p> <p>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.</p>		N/A

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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.		
10.6.2.2	<p>RS1 limits (to be superseded, see 10.6.3.2)</p> <p>RS1 is a class 1 acoustic energy source that does not exceed the following:</p> <ul style="list-style-type: none"> – 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. – 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 ≤ 27 mV (analogue interface) or -25 dBFS (digital interface) when playing the fixed “programme simulation noise” described in EN 50332-1. – The RS1 limits will be updated for all devices as per 10.6.3.2. 		N/A
10.6.2.3	<p>RS2 limits (to be superseded, see 10.6.3.3)</p> <p>RS2 is a class 2 acoustic energy source that does not exceed the following:</p> <ul style="list-style-type: none"> – 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 130 detection, the $L_{Aeq,T}$ acoustic output shall be ≤ 100 dB(A) when playing the fixed “programme simulation noise” as described in EN 50332-1. – 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 EN 50332-1. 		N/A
10.6.2.4	<p>RS3 limits</p> <p>RS3 is a class 3 acoustic energy source that exceeds RS2 limits.</p>		N/A
10.6.3	Classification of devices (new)		N/A

EN IEC 62368-1, IEC 62368-1			
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 of 23 June 2009, are given below.		N/A
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 $L_{Aeq,T}$ acoustic output shall be ≤ 80 dB when playing the fixed “programme simulation noise” described in EN 50332-1. – 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.		N/A
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, shall be ≤ 80 dB when playing the fixed “programme simulation noise” described in EN 50332-1. – 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 EN50332-3, shall be ≤ 15 mV (analogue interface) or -30 dBFS (digital interface) when playing the fixed “programme simulation noise” described in EN 50332-1.		N/A
10.6.4	Requirements for maximum sound exposure		N/A
10.6.4.1	Measurement methods All volume controls shall be turned to maximum		N/A

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	during tests. Measurements shall be made in accordance with EN 50332-1 or EN 50332-2 as applicable.		
10.6.4.2	<p>Protection of persons</p> <p>Except as given below, protection requirements for parts accessible to ordinary persons, instructed persons and skilled persons are given in 4.3.</p> <p>NOTE 1 Volume control is not considered a safeguard.</p> <p>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.</p> <p>Alternatively, the instructional safeguard may be given through the equipment display during use.</p> <p>The elements of the instructional safeguard shall be as follows:</p> <div style="text-align: center;">  </div> <ul style="list-style-type: none"> – element 1a: the symbol , IEC 60417-6044 (2011-01) – element 2: “High sound pressure” or equivalent wording – element 3: “Hearing damage risk” or equivalent wording – element 4: “Do not listen at high volume levels for long periods.” or equivalent wording <p>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.</p> <p>The equipment shall provide a means to actively inform the user of the increased sound level when the equipment is operated with an output exceeding RS1. Any means used shall be acknowledged by the user before activating a mode of operation which allows for an output exceeding RS1. The acknowledgement does not need to be repeated more than once every 20 h of cumulative listening time.</p> <p>NOTE 2 Examples of means include visual or audible signals. Action from the user is always needed.</p> <p>NOTE 3 The 20 h listening time is the accumulative listening</p>		N/A

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>time, independent of how often and how long the personal music player has been switched off.</p> <p>A skilled person shall not be unintentionally exposed to RS3.</p>		
10.6.5	Requirements for dose-based systems		N/A
10.6.5.1	<p>General requirements</p> <p>Personal music players shall give the warnings as provided below when tested according to EN 50332-3, using the limits from this clause.</p> <p>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.</p> <p>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.</p>		N/A
10.6.5.2	<p>Dose-based warning and requirements</p> <p>When a dose of 100 % <i>CSD</i> is reached, and at least at every 100 % further increase of <i>CSD</i>, the device shall warn the user and require an acknowledgement. In case the user does not acknowledge, the output level shall automatically decrease to compliance with class RS1.</p> <p>The warning shall at least clearly indicate that listening above 100 % <i>CSD</i> leads to the risk of hearing damage or loss.</p>		N/A
10.6.5.3	<p>Exposure-based requirements</p> <p>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.</p>		N/A

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>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.</p> <p>The EL settling time (time from starting level reduction to reaching target output) shall be 10 s or faster.</p> <p>Test of EL functionality is conducted according to EN 50332-3, 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 unweighted 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.</p> <p>NOTE In case the source is known not to be music (or test signal), the EL may be disabled.</p>		

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
10.6.6	Requirements for listening devices (headphones, earphones, etc.)		N/A
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 maximize the measured acoustic output, the input voltage of the listening device when playing the fixed “programme simulation noise” as described in EN 50332-1 shall be ≥ 75 mV. NOTE The values of 94 dB and 75 mV correspond with 85 dB and 27 mV or 100 dB and 150 mV.		N/A
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, 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/A
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; 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/A
10.6.6.4	Measurement method <i>Measurements shall be made in accordance with EN 50332-2 as applicable.</i>		N/A
3	Modification to the whole document		

EN IEC 62368-1, IEC 62368-1							
Clause	Requirement + Test			Result - Remark		Verdict	
	Delete all the “country” notes in the reference document according to the following list:					P	
	0.2.1	Note 1 and 2	1	Note 4 and 5	3.3.8.1		Note 2
	3.3.8.3	Note 1	4.1.15	Note	4.7.3		Note 1 and 2
	5.2.2.2	Note	5.4.2.3.2.2 Table 12	Note c	5.4.2.3.2.4		Note 1 and 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 3 and 4
	5.6.8	Note 2	5.7.6	Note	5.7.7.1		Note 1 and Note 2
	8.5.4.2.3	Note	10.2.1 Table 39	Note 3 and 4 and 5	10.5.3		Note 2
	10.6.1	Note 3	F.3.3.6	Note 3	Y.4.1		Note
	Y.4.5	Note					
4	Modification to Clause 1					P	
1	Add the following note: NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2011/65/EU.					P	

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
5	Modification to 4.Z1		N/A
4.Z1	<p>Add the following new subclause after 4.9:</p> <p>To protect against excessive current, short-circuits and earth faults in circuits connected to an a.c. mains, protective devices shall be included either as integral parts of the equipment or as parts of the building installation, subject to the following, a), b) and c):</p> <p>a) except as detailed in b) and c), protective devices necessary to comply with the requirements of B.3.1 and B.4 shall be included as parts of the equipment;</p> <p>b) for components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, short-circuit and earth fault protection may be provided by protective devices in the building installation;</p> <p>c) it is permitted for pluggable equipment type B or permanently connected equipment, to rely on dedicated overcurrent and short-circuit protection in the building installation, provided that the means of protection, e.g. fuses or circuit breakers, is fully specified in the installation instructions.</p> <p>If reliance is placed on protection in the building installation, the installation instructions shall so state, except that for pluggable equipment type A the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet.</p>		N/A
6	Modification to 5.4.2.3.2.4		N/A
5.4.2.3.2.4	<p>Add the following to the end of this subclause:</p> <p>The requirement for interconnection with external circuit is in addition given in EN 50491-3:2009.</p>		N/A
7	Modification to 10.2.1		N/A
10.2.1	<p>Add the following to ^{c)} and ^{d)} in table 39:</p> <p>For additional requirements, see 10.5.1.</p>		N/A

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
8	Modification to 10.5.1		N/A
10.5.1	<p>Add the following after the first paragraph:</p> <p>For RS 1 compliance is checked by measurement under the following conditions:</p> <p>In addition to the normal operating conditions, all controls adjustable from the outside 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.</p> <p>NOTE Z1 Soldered joints and paint lockings are examples of adequate locking.</p> <p>The dose-rate is determined by means of a radiation monitor with an effective area of 10 cm², at any point 10 cm from the outer surface of the apparatus.</p> <p>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.</p> <p>For RS1, the dose-rate shall not exceed 1 µSv/h taking account of the background level.</p> <p>NOTE Z2 These values appear in Directive 96/29/Euratom of 13 May 1996.</p>		N/A
9	Modification to G.7.1		N/A
G.7.1	<p>Add the following note:</p> <p>NOTE Z1 The harmonized code designations corresponding to the IEC cord types are given in Annex ZD.</p>		N/A

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
10	Modification to Bibliography		N/A
	<p>Add the following notes for the standards indicated:</p> <p>IEC 60130-9 NOTE Harmonized as EN 60130-9. 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 NOTE Harmonized as EN 60664-5. IEC 61032:1997 NOTE Harmonized as EN 61032:1998 (not modified). 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 61643-1 NOTE Harmonized as EN 61643-1. 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 61643-331.</p>		N/A
11	ADDITION OF ANNEXES		N/A
ZB	ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)		N/A
4.1.15	<p>Denmark, Finland, Norway and Sweden</p> <p>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.</p> <p>The marking text in the applicable countries shall be as follows:</p> <p>In Denmark: "Apparatets stikprop skal tilsluttes en stikkontakt med jord som giver forbindelse til stikproppens jord." In Finland: "Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan" In Norway: "Apparatet må tilkoples jordet stikkontakt" In Sweden: "Apparaten skall anslutas till jordat uttag"</p>		N/A

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.7.3	<p>United Kingdom</p> <p>To the end of the subclause the following is added:</p> <p>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</p>		N/A
5.2.2.2	<p>Denmark</p> <p>After the 2nd paragraph add the following:</p> <p>A warning (marking safeguard) for high touch current is required if the touch current exceeds the limits of 3,5 mA a.c. or 10 mA d.c.</p>		N/A
5.4.11.1 and Annex G	<p>Finland and Sweden</p> <p>To the end of the subclause the following is added:</p> <p>For separation of the telecommunication network from earth the following is applicable:</p> <p>If this insulation is solid, including insulation forming part of a component, it shall at least consist of either</p> <ul style="list-style-type: none"> • 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. <p>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</p> <ul style="list-style-type: none"> • passes the tests and inspection criteria of 5.4.8 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), <p>and</p> <ul style="list-style-type: none"> • is subject to routine testing for electric strength during manufacturing, using a test voltage of 1,5 kV. <p>It is permitted to bridge this insulation with a capacitor complying with EN 60384-14:2005,</p>		N/A

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>subclass Y2.</p> <p>A capacitor classified Y3 according to EN 60384-14:2005, may bridge this insulation under the following conditions:</p> <ul style="list-style-type: none"> 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 5.4.11; the additional testing shall be performed on all the test specimens as described in EN 60384-14; <p>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.</p>		
5.5.2.1	<p>Norway</p> <p>After the 3rd paragraph the following is added:</p> <p>Due to the IT power system used, capacitors are required to be rated for the applicable line-to-line voltage (230 V).</p>		N/A
5.5.6	<p>Finland, Norway and Sweden</p> <p>To the end of the subclause the following is added:</p> <p>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.10.2.</p>		N/A
5.6.1	<p>Denmark</p> <p>Add to the end of the subclause Due to many existing installations where the socket-outlets can be protected with fuses with higher rating than the rating of the socket-outlets the protection for pluggable equipment type A shall be an integral part of the equipment. <i>Justification:</i> In Denmark an existing 13 A socket outlet can be protected by a 20 A fuse.</p>		N/A
5.6.4.2.1	<p>Ireland and United Kingdom</p> <p>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.</p>		N/A

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
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.		N/A
5.6.5.1	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 mm ² to 1,5 mm ² in cross-sectional area.		N/A
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/A
5.7.6	Denmark To the end of the subclause the following is added: The installation instruction shall be affixed to the equipment if the protective conductor current exceeds the limits of 3,5 mA a.c. or 10 mA d.c.		N/A

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.7.6.2	<p>Denmark</p> <p>To the end of the subclause the following is added: The warning (marking safeguard) for high touch current is required if the touch current or the protective current exceed the limits of 3,5 mA .</p>		N/A
5.7.7.1	<p>Norway and Sweden</p> <p>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.</p> <p>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.</p> <p>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:</p> <p>“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)”</p> <p>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 r.m.s., 50 Hz or 60 Hz, for 1 min.</p> <p>Translation to Norwegian (the Swedish text will also be accepted in Norway):</p> <p>“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.”</p>		N/A

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>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."</p>		
8.5.4.2.3	<p>United Kingdom</p> <p>Add the following after the 2nd dash bullet in 3rd paragraph:</p> <p>An emergency stop system complying with the requirements of IEC 60204-1 and ISO 13850 is required where there is a risk of personal injury.</p>		N/A
B.3.1 and B.4	<p>Ireland and United Kingdom</p> <p>The following is applicable:</p> <p>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</p>		N/A

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
G.4.2	<p>Denmark</p> <p>To the end of the subclause the following is added:</p> <p>Supply cords of single phase appliances having a rated current not exceeding 13 A shall be provided with a plug according to DS 60884-2-D1:2011.</p> <p>CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a.</p> <p>If a single-phase equipment having a RATED CURRENT exceeding 13 A or if a polyphase equipment is provided with a supply cord with a plug, this plug shall be in accordance with the standard sheets DK 6-1a in DS 60884-2-D1 or EN 60309-2.</p> <p>Mains socket outlets intended for providing power to Class II apparatus with a rated current of 2,5 A shall be in accordance DS 60884-2-D1:2011 standard sheet DKA 1-4a.</p> <p>Other current rating socket outlets shall be in compliance with Standard Sheet DKA 1-3a or DKA 1-1c.</p> <p>Mains socket-outlets with earth shall be in compliance with DS 60884-2-D1:2011 Standard Sheet DK 1-3a, DK 1-1c, DK1-1d, DK 1-5a or DK 1-7a</p> <p><i>Justification:</i> Heavy Current Regulations, Section 6c</p>		N/A
G.4.2	<p>United Kingdom</p> <p>To the end of the subclause the following is added:</p> <p>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.</p>		N/A

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
G.7.1	<p>United Kingdom</p> <p>To the first paragraph the following is added:</p> <p>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.</p> <p>NOTE "Standard plug" is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug.</p>		N/A
G.7.1	<p>Ireland</p> <p>To the first paragraph the following is added:</p> <p>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</p>		N/A
G.7.2	<p>Ireland and United Kingdom</p> <p>To the first paragraph the following is added:</p> <p>A power supply cord with a conductor of 1,25 mm² is allowed for equipment which is rated over 10 A and up to and including 13 A.</p>		N/A

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
ZC	ANNEX ZC, NATIONAL DEVIATIONS (EN)		N/A
10.5.2	<p>Germany</p> <p>The following requirement applies:</p> <p>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.</p> <p><i>Justification:</i> German ministerial decree against ionizing radiation (Röntgenverordnung), in force since 2002-07-01, implementing the European Directive 96/29/EURATOM.</p> <p>NOTE Contact address: Physikalisch-Technische Bundesanstalt, Bundesallee 100, D-38116 Braunschweig, Tel.: Int+49-531-592-6320, Internet: http://www.ptb.de</p>		N/A

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

ZD	IEC and CENELEC CODE DESIGNATIONS FOR FLEXIBLE CORDS (EN)		N/A
	Type of flexible cord	Code designations	
		IEC	CENELEC
	PVC insulated cords		N/A
	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

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

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⁾	
264Vac	All circuits	Normal	--	--	--	--	ES3
		Abnormal condition	--	--	--	--	
		Single fault – SC/OC	--	--	--	--	
264Vac	T1 output A-B	Normal	23.5Vpk	--	--	--	ES1
		Abnormal-T1 output overload	23.5Vpk	--	--	--	
		Single fault – CE1 short circuit	0Vpk	--	--	--	
264Vac	L /N to accessible enclosure	Normal	--	0.06mA	--	--	ES1
		Abnormal condition	--	0.06mA	--	--	
		Single fault –EC4 SC	--	0.02mA	--	--	
Supplementary information:							
1) Type: Steady state (SS), Capacitance (CP), Single pulse (SP), Repetitive pulses (RP), etc.							
2) Additional Info: Frequency, Pulse duration, Pulse off time, Capacitance value, etc.							

5.4.1.8	TABLE: Working voltage measurement				P
Location	RMS voltage (V)	Peak voltage (V)	Frequency (Hz)	Comments	
M5-3C-80					
T1 pin1- A	231	380	60Hz	--	
T1 pin2- A	230	400	60Hz	--	
T1 pin3-A	202	344	60Hz	--	
T1 pin4- A	225	476	60Hz	--	
T1 pin1- B	225	376	60Hz	--	
T1 pin2- B	225	372	60Hz	--	
T1 pin3- B	207	364	60Hz	--	
T1 pin4- B	228	478	60Hz	Max. Peak	
CY1 pin1-2	225	374	60Hz	--	
K1 pin1-2	240	338	60Hz	Max. RMS	
Supplementary information: M5-1C-80 and M5-2C-80 test data are the same as above.					

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

5.4.1.10.2	TABLE: Vicat softening temperature of thermoplastics			N/A
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			P
Allowed impression diameter (mm) :		≤ 2 mm		—
Object/Part No./Material	Manufacturer/trademark	Thickness (mm)	Test temperature (°C)	Impression diameter (mm)
Plastic enclosure Model: 940(f1)	SABIC INNOVATIVE PLASTICS US L L C	1.1*3	125	1.4
--	--	--	--	--
Supplementary information: Bobbin of transformer T1 is made of phenolic materials, no need do test.				

5.4.2, 5.4.3	TABLE: Minimum Clearances/Creepage distance							P
Clearance (cl) and creepage distance (cr) at/of/between:	U _p (V)	U _{rms} (V)	Freq ¹⁾ (Hz)	Required cl (mm)	cl (mm)	E.S. ²⁾ (V)	Required cr (mm)	cr (mm)
(Form model: M5-3C-80)								
Basic insulation:								
L to N before fuse resistor R1	340	240	<30k	1.5	3.30	--	2.4	3.30
Two pins of fuse resistor R1	340	240	<30k	1.5	2.83	--	2.4	2.83
Reinforced insulation:								
Primary component C1 to T1 secondary pin	480	240	<30k	3.0	5.49	--	4.8	5.49
CY1 pin1-2	480	240	<30k	3.0	7.54	--	4.8	7.54
Primary components relay to secondary components Q1	480	240	<30k	3.0	5.42	--	4.8	5.42
T1 core to sec. pin	480	240	<30k	3.0	>10	--	4.8	>10
T1 pri. winding to sec. Pin	480	240	<30k	3.0	>10	--	4.8	>10
Primary trace to accessible enclosure	480	240	<30k	3.0	>10	--	4.8	>10
Supplementary information: M5-1C-80 and M5-2C-80 test data are the same as above.								

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

Note 1: Only for frequency above 30 kHz

Note 2: Complete Electric Strength voltage (E.S. (V) when 5.4.2.4 applied)

Note 3: Core of transformer T1 is deeming as primary conductor.

Note 4: Triple insulated wire used for secondary winding of the transformer.

Note 5: If no specified, the worst condition were recorded.

5.4.4.2	TABLE: Minimum distance through insulation				P
Distance through insulation (DTI) at/of	Peak voltage (V)	Insulation	Required DTI (mm)	Measured DTI (mm)	
Plastic enclosure	480	Reinforced insulation	0.4	See appended table 4.1.2	
Bobbin of T1	480	Reinforced insulation	0.4	See appended table 4.1.2	
Supplementary information:					

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

5.4.9	TABLE: Electric strength tests				P
Test voltage applied between:		Voltage shape (Surge, Impulse, AC, DC, etc.)	Test voltage (V)	Breakdown Yes / No	
Basic insulation					
L to N before fuse resistor R1 (R1 disconnected)		DC	2500V	No	
Reinforce insulation					
L/N to plastic enclosure		DC	4000V	No	
From T1 Primary to secondary		DC	4000V	No	
From T1 Core to secondary		DC	4000V	No	
Any one layer insulation tape of transformer T1		DC	4000V	No	
Supplementary information: When used dc voltage test, the voltage is gradully raised from zero to the prescribed voltage and maintained at that value for 60s, then reprated it in reverse polarity.					

5.5.2.2	TABLE: Stored discharge on capacitors					N/A
Location	Supply voltage (V)	Operating and fault condition ¹⁾	Switch position	Measured voltage (Vpk)	ES Class	

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

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Supplementary information: X-capacitors installed for testing: <input type="checkbox"/> bleeding resistor rating: <input type="checkbox"/> ICX: 1) Normal operating condition (e.g., normal operation, or open fuse), SC= short circuit, OC= open circuit					

5.6.6	TABLE: Resistance of protective conductors and terminations				N/A
Location	Test current (A)	Duration (min)	Voltage drop (V)	Resistance (Ω)	
--	--	--	--	--	
Supplementary information:					

5.7.4	TABLE: Unearthed accessible parts					P
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: See table 5.2 Abbreviation: SC= short circuit; OC= open circuit						

5.7.5	TABLE: Earthed accessible conductive part			N/A
Supply voltage (V) :				—
Phase(s) :		[] Single Phase; [] Three Phase: [] Delta [] Wye		
Power Distribution System :		[] TN [] TT [] IT		
Location		Fault Condition No in IEC 60990 clause 6.2.2	Touch current (mA)	Comment
--		--	--	--
Supplementary Information:				

5.8	TABLE: Backfeed safeguard in battery backed up supplies					N/A
Location	Supply voltage (V)	Operating and fault condition	Time (s)	Open-circuit voltage (V)	Touch current (A)	ES Class
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Supplementary information: Abbreviation: SC= short circuit, OC= open circuit						

6.2.2	TABLE: Power source circuit classifications					P
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EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

Location	Operating and fault condition	Voltage (V)	Current (A)	Max. Power ¹⁾ (W)	Time (S)	PS class
All primary circuits	Normal	264V	--	--	--	PS3 (Declared)

Supplementary information:

1. The Primary circuits has been classified as PS3 circuits specified.

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				P
Location	Open circuit voltage after 3 s (Vpk)	Measured r.m.s current (A)	Calculated value	Arcing PIS? Yes / No	
--	--	--	--	--	
--	--	--	--	--	
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Supplementary information: The Primary circuits exist Arcing PIS in equipment.

6.2.3.2	TABLE: Determination of resistive PIS			P
Location	Operating and fault condition	Dissipate power (W)	Arcing PIS? Yes / No	
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Supplementary information: The Primary circuits exist Resistive PIS in equipment.

Abbreviation: SC= short circuit; OC= open circuit

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

9.6	TABLE: Temperature measurements for wireless power transmitters		N/A
Supply voltage (V) :			—
Max. transmit power of transmitter (W) :			—

EN IEC 62368-1, IEC 62368-1								
Clause	Requirement + Test				Result - Remark			Verdict
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)
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
Supplementary information:								

5.4.1.4, 9.3, B.1.5, B.2.6	TABLE: Temperature measurements					P
Supply voltage (V) :		90V 60Hz		264V 50Hz		—
Ambient temperature during test T_{amb} (°C) :		24.2	Shift to 40 °C	23.9	Shift to 40 °C	—
Maximum measured temperature T of part/at:		T (°C)				Allowed T_{max} (°C)
Model: M5-3C-80						
Ambient	24.2	40.0	23.9	40.0	--	
RV1 body on power board	41.8	57.6	40.1	56.2	85	
CX1 body on power board	39.8	55.6	41.7	57.8	105	
CE1 body on power board	41.5	57.3	44.4	60.5	105	
T1 winding on power board	45.5	61.3	50.0	66.1	90	
T1 bobbin on power board	44.5	60.3	49.6	65.7	150	
CY1 body on power board	39.9	55.7	43.3	59.4	125	
CE3 body on power board	43.1	58.9	45.3	61.4	105	
K1 body on power board	45.6	61.4	47.5	63.6	80	
K2 body on power board	50.8	66.6	51.5	67.6	80	
PCB near U1on power board	46.0	61.8	52.2	68.3	130	
PCB near T1 on power board	42.2	58.0	46.3	62.4	130	
PCB near U4 on control board	39.3	55.1	39.7	55.8	130	
PCB near U2 on control board	35.0	50.8	34.5	50.6	130	
Enclosure inside near T1	36.2	52.0	37.4	53.5	80	
Accessible parts (shift to 25°C)						
Ambient	24.2	25.0	23.9	25.0	--	
Plastic enclosure outside near T1	35.5	36.3	37.2	38.3	77#	
Touch pad (plastic)	30.3	31.1	30.8	31.9	77#	

EN IEC 62368-1, IEC 62368-1							
Clause	Requirement + Test			Result - Remark			Verdict
Plastic enclosure side		31.4		32.2	31.7	32.8	77#
Plastic enclosure outside near LED		29.7		30.5	31.1	32.2	77#
Temperature T of winding:	t_1 (°C)	R_1 (Ω)	t_2 (°C)	R_2 (Ω)	T (°C)	Allowed T_{max} (°C)	Insulation class
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--
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Supplementary information: # The external accessible surfaces touched time for >1 s and < 10 s during normal use.							

5.4.1.4, 9.3, B.1.5, B.2.6	TABLE: Temperature measurements					P
Supply voltage (V) :		90V 60Hz		264V 50Hz		—
Ambient temperature during test T_{amb} (°C) :		23.8	Shift to 40 °C	23.3	Shift to 40 °C	—
Maximum measured temperature T of part/at:		T (°C)				Allowed T_{max} (°C)
Model: M5-2C-80						
Ambient		23.8	40.0	23.3	40.0	--
RV1 body on power board		42.7	58.9	41.0	57.7	85
CX1 body on power board		40.9	57.1	42.8	59.5	105
CE1 body on power board		42.7	58.9	45.6	62.3	105
T1 winding on power board		46.0	62.2	50.5	67.2	90
T1 bobbin on power board		44.7	60.9	49.9	66.6	150
CY1 body on power board		40.6	56.8	44.0	60.7	125
CE3 body on power board		44.6	60.8	46.8	63.5	105
K1 body on power board		46.2	62.4	48.1	64.8	80
K2 body on power board		52.0	68.2	52.7	69.4	80
PCB near U1on power board		46.8	63.0	53.0	69.7	130
PCB near T1 on power board		43.7	59.9	47.8	64.5	130
PCB near U4 on control board		40.6	56.8	41.0	57.7	130
PCB near U2 on control board		35.9	52.1	35.4	52.1	130
Enclosure inside near T1		37.7	53.9	38.9	55.6	80

EN IEC 62368-1, IEC 62368-1							
Clause	Requirement + Test			Result - Remark			Verdict
Accessible parts (shift to 25°C)							
Ambient		23.8	25.0	23.3	25.0	--	
Plastic enclosure outside near T1		36.2	37.4	37.9	39.6	77#	
Touch pad (plastic)		31.2	32.4	31.7	33.4	77#	
Plastic enclosure side		32.2	33.4	32.6	34.3	77#	
Plastic enclosure outside near LED		30.5	31.7	32.0	33.7	77#	
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:							
# The external accessible surfaces touched time for >1 s and < 10 s during normal use.							

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
Model: M5-3C-80								
90	50Hz	6.10	--	543	--	R1	6.10	Max. normal operating condition, load 6A
90	60Hz	6.10	--	543	--	R1	6.10	Max. normal operating condition, load 6A
100	50Hz	6.03*	6.0	597	--	R1	6.03*	Max. normal operating condition, load 6A
100	60Hz	6.03*	6.0	597	--	R1	6.03*	Max. normal operating condition, load 6A
240	50Hz	5.84	6.0	1320	--	R1	5.84	Max. normal operating condition, load 1320W
240	60Hz	5.84	6.0	1320	--	R1	5.84	Max. normal operating condition, load 1320W
264	50Hz	5.37	--	1320	--	R1	5.37	Max. normal operating condition, load 1320W
264	60Hz	5.37	--	1320	--	R1	5.37	Max. normal operating condition, load 1320W

EN IEC 62368-1, IEC 62368-1			
Clause	Requirement + Test		Verdict

Model: M5-2C-80								
90	50Hz	10.10	--	903	--	R1	10.10	Max. normal operating condition, load 10A
90	60Hz	10.10	--	903	--	R1	10.10	Max. normal operating condition, load 10A
100	50Hz	10.03*	10.0	997	--	R1	10.03*	Max. normal operating condition, load 10A
100	60Hz	10.03*	10.0	997	--	R1	10.03*	Max. normal operating condition, load 10A
240	50Hz	9.33	10.0	2200	--	R1	9.33	Max. normal operating condition, load 2200W
240	60Hz	9.33	10.0	2200	--	R1	9.33	Max. normal operating condition, load 2200W
264	50Hz	8.62	--	2200	--	R1	8.62	Max. normal operating condition, load 2200W
264	60Hz	8.62	--	2200	--	R1	8.62	Max. normal operating condition, load 2200W
Supplementary information: *Not exceed the rated current by more than 10%.								

B.3 TABLE: Abnormal operating tests							P
Ambient temperature T_{amb} (°C) :					--		—
Power source for EUT: Manufacturer, model/type, output rating :					--		—
Component No.	Condition	Supply voltage (V)	Test time	Fuse no.	Fuse current (A)	Observation	
Model: M5-3C-80							
Openings	Blocked	240V	3.5hours	R1	5.84→ 5.92	The temperature of accessible plastic enclosure less than the limit of TS2 (87°C), no hazard. Ambient: 25.0°C T1 winding: 62.3°C T1 bobbin: 61.8°C Enclosure outside near T1: 31.6°C	
T1 pin A-B (EC3)	OL	264V	4hours	R1	5.37→ 5.88	The maximum output current up to 1.21A, when over 1.23A unit shut down, no damage, no hazard., the	

EN IEC 62368-1, IEC 62368-1						
Clause	Requirement + Test				Result - Remark	
						unit shut down immediately, no fire or molten metal occurred, no hazard. Ambient: 25.0°C T1 winding: 71.5°C T1 bobbin: 70.6°C Enclosure outside near T1: 30.2°C The Max. temperature of winding less than the limit of Class A for table G.3. The temperature of accessible plastic enclosure less than the limit of TS2 (87°C).
Model: M5-2C-80						
Openings	Blocked	240V	3.7hours	R1	9.33→ 9.36	The temperature of accessible plastic enclosure less than the limit of TS2 (87°C), no hazard. Ambient: 25.0°C T1 winding: 63.4°C T1 bobbin: 62.1°C Enclosure outside near T1: 32.0°C
T1 pin A-B (EC3)	OL	264V	4.5hours	R1	8.62→ 9.18	The maximum output current up to 1.22A, when over 1.24A unit shut down, no damage, no hazard., the unit shut down immediately, no fire or molten metal occurred, no hazard. Ambient: 25.0°C T1 winding: 70.8°C T1 bobbin: 71.9°C Enclosure outside near T1: 31.0°C The Max. temperature of winding less than the limit of Class A for table G.3. The temperature of accessible plastic enclosure less than the limit of TS2 (87°C).
Supplementary information: The temperature limited of transformer winding under fault and abnormal condition is 150-10-(40-25)=125°C 1. 1. After test, all safeguards comply with applicable requirements.						

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

2. The Hi-pot test conducted successfully after every fault condition test.

3. The output is equal to the input of AC mains. No need test.

Test table is provided to record abnormal and fault conditions for all applicable energy sources including Thermal burn injury. Column "Abnormal/Fault." Specify if test condition by indicating "Abnormal" then the condition for a Clause B.3 test or "Single Fault" then the condition for Clause B.4.

1) SC: Short-circuited; OC: Open-circuited; OL: Overloaded; BL: Blocked.

2) The test result shown all safeguards remained effective and didn't lead to a single fault condition during abnormal operating condition; In addition all safeguards complied with applicable requirements in this standard after restoration of normal operating conditions.

B.4		TABLE: Fault condition tests					P
Ambient temperature T _{amb} (°C) :					25.0		—
Power source for EUT: Manufacturer, model/type, output rating :					--		—
Component No.	Condition	Supply voltage (V)	Test time	Fuse no.	Fuse current (A)	Observation	
Model: M5-3C-80							
DB1	SC	264V	1s	R1	0	R1 opened immediately, no hazards.	
CE1	SC	264V	1s	R1	0	R1 opened immediately, no hazards.	
CE2	SC	264V	1s	R1	0	R1 opened immediately, no hazards.	
R5	SC	264V	30mins	R1	5.37	The EUT working normally, No hazards.	
C3	SC	264V	30mins	R1	0.1	The EUT output shut down, recoverable, no hazards.	
U1 pin 1-5	SC	264V	1s	R1	0	R1 opened immediately, no hazards.	
U1 pin 3-5	SC	264V	1s	R1	0	R1 opened immediately, no hazards.	
T1 pin A-B	SC	264V	30mins	R1	0.1	The EUT output shut down, recoverable, no hazards.	
CE3	SC	264V	30mins	R1	0.1	The EUT output shut down, recoverable, no hazards.	
Model: M5-2C-80							
DB1	SC	264V	1s	R1	0	R1 opened immediately, no hazards.	
CE1	SC	264V	1s	R1	0	R1 opened immediately, no hazards.	
CE2	SC	264V	1s	R1	0	R1 opened immediately, no	

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

						hazards.
R5	SC	264V	30mins	R1	8.63	The EUT working normally, No hazards.
C3	SC	264V	30mins	R1	0.1	The EUT output shut down, recoverable, no hazards.
U1 pin 1-5	SC	264V	1s	R1	0	R1 opened immediately, no hazards.
U1 pin 3-5	SC	264V	1s	R1	0	R1 opened immediately, no hazards.
T1 pin A-B	SC	264V	30mins	R1	0.1	The EUT output shut down, recoverable, no hazards.
CE3	SC	264V	30mins	R1	0.1	The EUT output shut down, recoverable, no hazards.

Supplementary information:

The temperature limited of transformer winding under fault and abnormal condition is $150-10-(40-25)=125^{\circ}\text{C}$

1. After test, all safeguards comply with applicable requirements.
2. The Hi-pot test conducted successfully after every fault condition test.
3. All "Single Fault" tests of fuse open were repeated 10 times with the same results

Test table is provided to record abnormal and fault conditions for all applicable energy sources including Thermal burn injury. Column "Abnormal/Fault." Specify if test condition by indicating "Abnormal" then the condition for a Clause B.3 test or "Single Fault" then the condition for Clause B.4.

- 1) SC: Short-circuited; OC: Open-circuited; OL: Overloaded; BL: Blocked.
- 2) The test result shown all safeguards remained effective and didn't lead to a single fault condition during abnormal operating condition; In addition all safeguards complied with applicable requirements in this standard after restoration of normal operating conditions.

M.3	TABLE: Protection circuits for batteries provided within the equipment					N/A
Is it possible to install the battery in a reverse polarity position? :					—	
Equipment Specification	Charging					
	Voltage (V)		Current (A)			
Manufacturer/type	Battery specification					
	Non-rechargeable batteries		Rechargeable batteries			
	Discharging current (A)	Unintentional charging current (A)	Charging		Discharging current (A)	Reverse charging current (A)
			Voltage (V)	Current (A)		
--	--	--	--	--	--	--
--	--	--	--	--	--	--
--	--	--	--	--	--	--
Note: The tests of M.3.2 are applicable only when above appropriate data is not available.						

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

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

Specified battery temperature (°C) :							
Component No.	Fault condition	Charge/discharge mode	Test time	Temp. (°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					N/A
Maximum specified charging voltage (V) :						—
Maximum specified charging current (A) :						—
Highest specified charging temperature (°C) :						
Lowest specified charging temperature (°C) :						
Battery manufacturer/type	Operating and fault condition	Measurement			Observation	
		Charging voltage (V)	Charging current (A)	Temp. (°C)		
--	--	--	--	--	--	
--	--	--	--	--	--	
--	--	--	--	--	--	
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/A
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
Part/Location	Material	Thickness (mm)	Probe	Force	Test Duration (s)	Observation	

EN IEC 62368-1, IEC 62368-1						
Clause	Requirement + Test			Result - Remark		Verdict
				(N)		
Internal components	--	--	--	10	5s	No reduction the clearances and creepage distances
Top plastic enclosure	Plastic	Min.1.1mm	--	100	5s	No reduction the clearances and creepage distances
Bottom plastic enclosure	Plastic	Min.1.1mm	--	100	5s	No reduction the clearances and creepage distances
Side plastic enclosure	Plastic	Min.1.1mm	--	100	5s	No reduction the clearances and creepage distances
Supplementary information:						

T.6, T.9	TABLE: Impact test				P
Location/part	Material	Thickness (mm)	Height (mm)	Observation	
Horizontal direction	Plastic	Min.1.1mm	1300	Enclosure remained intact, no crack opening developed. No insulation breakdown. No. hazards.	
Vertical direction	Plastic	Min.1.1mm	1300	Enclosure remained intact, no crack opening developed. No insulation breakdown. No. hazards.	
Supplementary information:					

T.7	TABLE: Drop test				N/A
Location/part	Material	Thickness (mm)	Height (mm)	Observation	
--	--	--	--	--	
--	--	--	--	--	
Supplementary information:					

T.8	TABLE: Stress relief test					P
Location/Part	Material	Thickness (mm)	Oven Temperature (°C)	Duration (h)	Observation	
Plastic enclosure	Plastic	Min.1.1mm	70	7	Enclosure remained intact, no crack opening developed. No insulation breakdown. No. hazards.	

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

Supplementary information:

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

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

4.1.2	TABLE: List of critical components (#)					P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾	
Plastic enclosure	SABIC INNOVATIVE PLASTICS US L L C	940(f1)	V-0, 80°C, Thickness: Min.1.1mm	UL 94, UL 746	UL E121562	
PCB	DONGGUAN BESTCHOICE ELECTRONICS CO.,LTD	YX-11	V-0, Min.130°C	UL 796, UL 94	UL E302201	
(Alt.)	SHENZHEN QUNHUI ELECTRONICS CO LTD	QH-D	V-0, Min.130°C	UL 796, UL 94	UL E506706	
Varistor (RV1)	Shantou High-New Technology Dev. Zone Songtian Enterprise Co., Ltd.	STE-10D471K	Min. 300VAC 85°C	EN 61051-1 EN 61051-2 EN 61051-2-2	VDE 40023049	
(Alt.)	HONGZHI ENTERPRISES LTD	HEL10D471K	Min. 300VAC 85°C	UL 1449	VDE 40037512	
Fuse resistor (R1)	Dong Guan DEEHO Electronic Co Ltd	FKN-1WS-T52-J-10R	10R, 1W	EN IEC 62368-1:2020+A11:2020 IEC 62368-1:2018	Test with appliance	
-Heat shrinkable tube	Interchangeable	Interchangeable	Min. 300V, Min. 105°C	UL 224	UL	
E-Capacitor (CE1,CE2)	DONG GUAN KNSCHA ELECTRONICS CO.,LTD.	D6.3L14	105°C 400V 4.7μF	EN IEC 62368-1:2020+A11:2020 IEC 62368-1:2018	Test with appliance	
(Alt.)	Shenzhen huarong weiye electronics co., Ltd.	D6.3L14	105°C 400V 4.7μF	EN IEC 62368-1:2020+A11:2020 IEC 62368-1:2018	Test with appliance	
X-Capacitor X2 (CX1)	SURETOP TECHNOLOGY Co. Ltd.	MPX	AC275V 0.047μF, 105°C	EN60384-14	VDE 40034508	

EN IEC 62368-1, IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
Y-Capacitor (CY1)	Shantou High-New Technology Dev. Zone Songtian Enterprise Co., Ltd.	Y1-400VAC-Y5P-221K	400V 220pF 125°C	EN60384-14	VDE 40025754
(Alt.)	Guangdong Hongzhi Electronic Technology Co., Ltd.	Y1-B-221K	400V 220pF 125°C	EN60384-14	VDE 40038760
Relay of M5-1C-80 (K1)	Zhejiang Fanhar Electronics Co., Ltd.	W11-1A2STLE-H-DC5V	DC5V 10A 250VAC	IEC 61810-1: 2015 EN 61810-1:2015	TUV R50332879
(Alt.)	SHENZHEN Golden Electrical Appliance Co Ltd.	GI-1A-5LH	DC5V 10A 250VAC	IEC 61810-1:2015 EN 61810-1:2015	TUV R50210280
Relay of M5-2C-80 (K1,K2)	Zhejiang Fanhar Electronics Co., Ltd.	W11-1A2STLE-H-DC5V	DC5V 10A 250VAC	IEC 61810-1: 2015 EN 61810-1:2015	TUV R50332879
(Alt.)	SHENZHEN Golden Electrical Appliance Co Ltd.	GI-1A-5LH	DC5V 10A 250VAC	IEC 61810-1:2015 EN 61810-1:2015	TUV R50210280
Relay of M5-3C-80 (K1,K2,K3)	Zhejiang Fanhar Electronics Co., Ltd.	W18-1AST-DC5V	DC5V 5A 250VAC	IEC 61810-1: 2015 EN 61810-1:2015	TUV R50406753
(Alt.)	Shenzhen Golden Electrical Appliance Co Ltd.	Y5-1A-5DH 5DH	5A 250VAC	IEC 61810-1: 2015 EN 61810-1:2015	TUV R50205017
(Alt.)	SUZHOU GEEKO ELECTRICAPPLIAN CES CO.,LTD	GK101-1AS-DC5V	5A 250VAC	IEC 61810-1: 2015 EN 61810-1:2015	TUV R50444381
Transformer (T1)	Shenzhen Xinchuang Long Electronic Technology Co., Ltd.	EE10	2.8mH 5V/500mA LP3669A	EN IEC 62368-1:2020+A11:2020 IEC 62368-1:2018	Test with appliance

EN IEC 62368-1, IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
(Alt.)	Dongguan Aeromagnetic Electronics Co., Ltd.	EE10	2.8mH 5V/500mA SN-5V/0.5A	EN IEC 62368-1:2020+A11:2020 IEC 62368-1:2018	Test with appliance
-Bobbin	ZHEJIANG JIAMIN PLASTIC CO LTD	PF2E6-985J(GF30+GG20)	V-0, 150°C Thickness: Min.0.8mm	UL 94, UL 746	UL E231508
-Primary wire	SHANTOU SHENGANG ELECTRICAL INDUSTRIAL CO LTD	2UEW	155°C	UL 1446	UL E239508
-Tape	SUZHOU MAILADUONA ELECTRIC MATERIAL CO LTD	JY313#	130°C	UL 510	UL E188295
-Secondary wire (Triple wire)	TEAMWORK INTERNATIONAL CORPORATION	TIWW-B	36-18AWG, 130°C	EN 62368-1:2014+A11:2017 IEC 62368-1:2014 UL 2353	VDE 40024497 UL E321186
-Varnish	SUZHOU TAIHU ELECTRIC ADVANCED MATERIAL CO LTD	T-4260(a)	MW 28-C, 130°C	UL1446	UL E228349
<p>Supplementary information:</p> <p>1) An asterisk indicates a mark which assures the agreed level of surveillance.</p> <p>2) (#): The information marked # is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report.</p>					

Appendix A - EUT PHOTOS

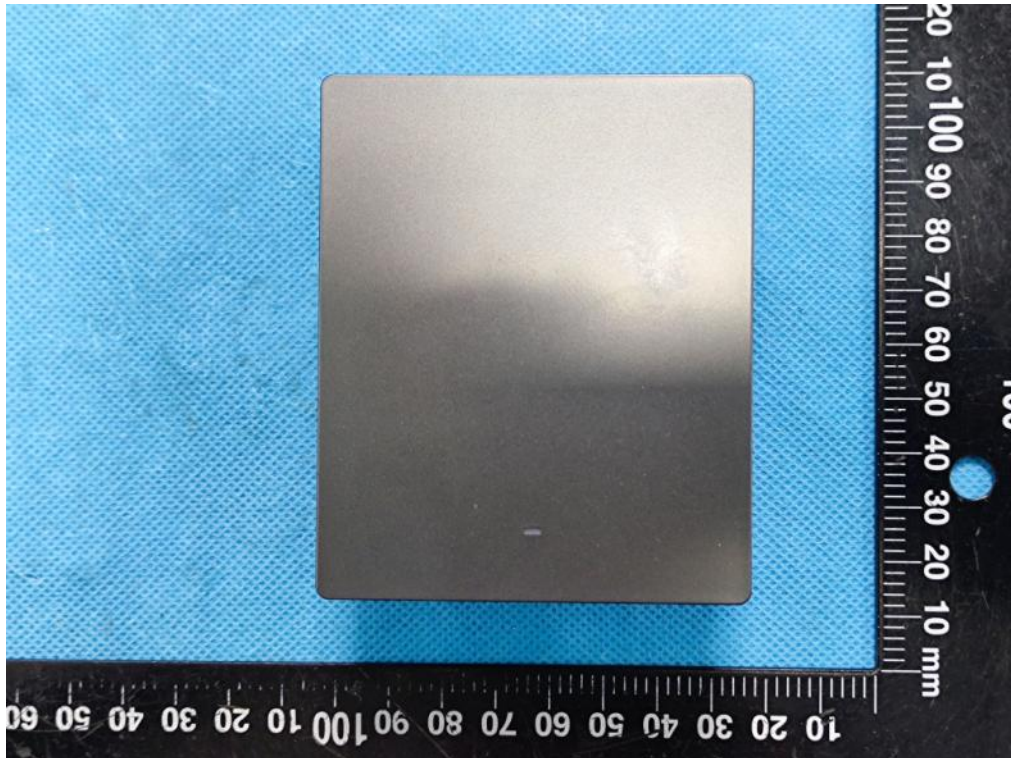


Photo 1 Top view(Model: M5-1C-80)

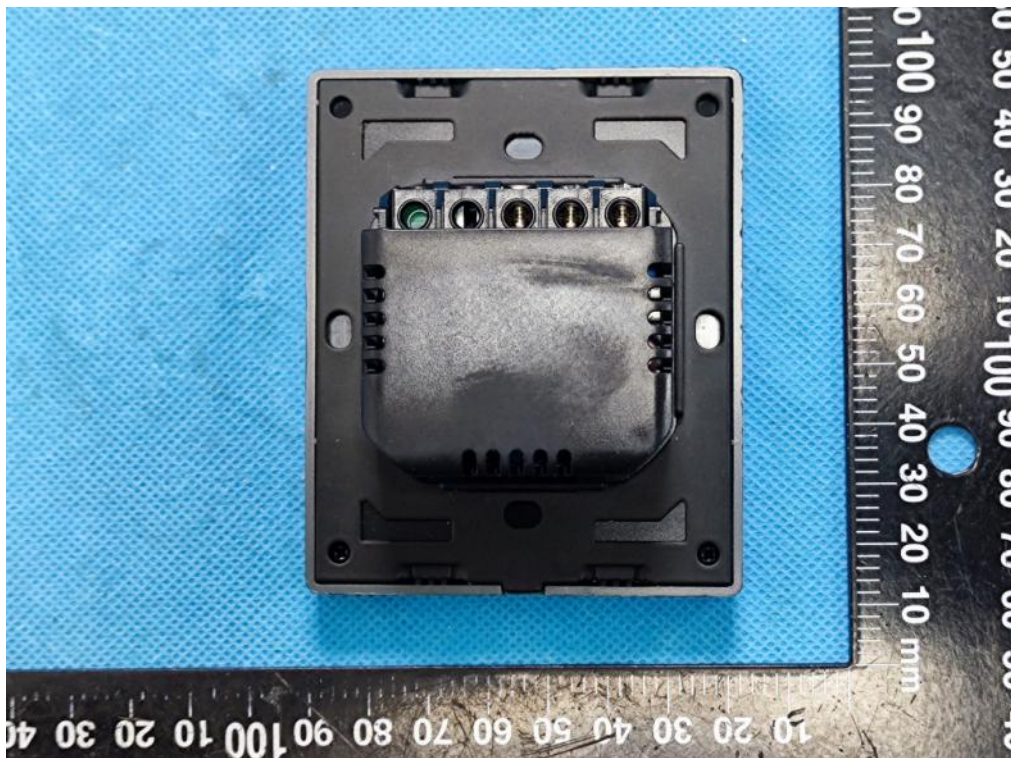


Photo 2 back view(Model: M5-1C-80)



Photo 3 Side view(Model: M5-1C-80)

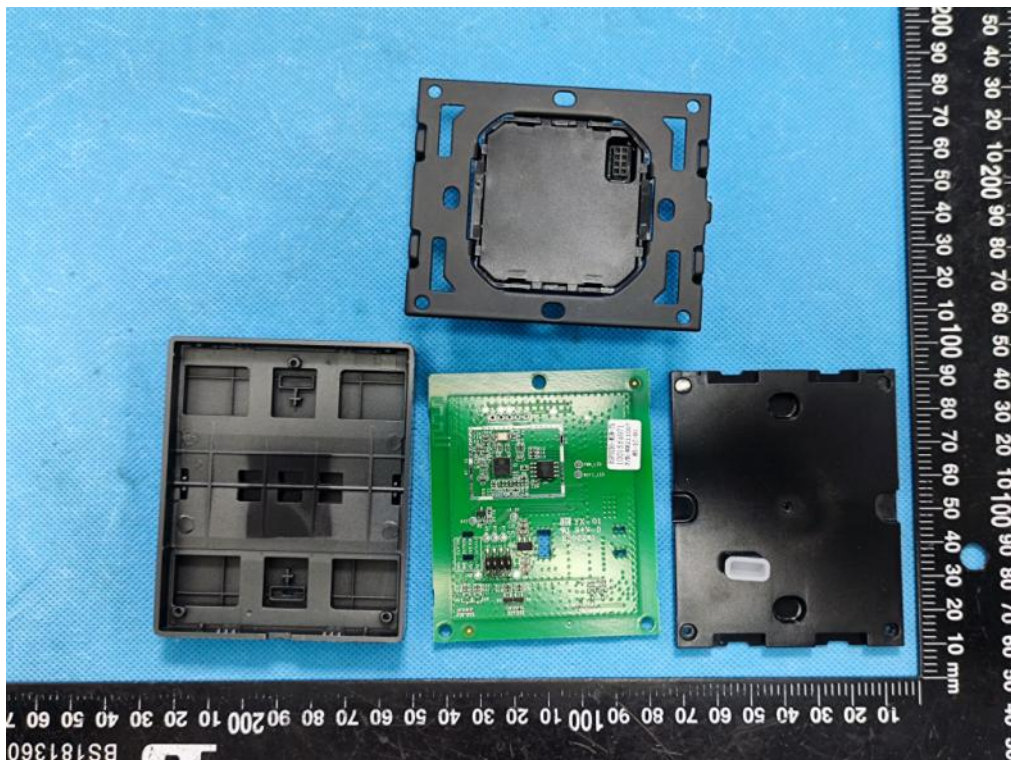


Photo 4 Uncover view(Model: M5-1C-80)

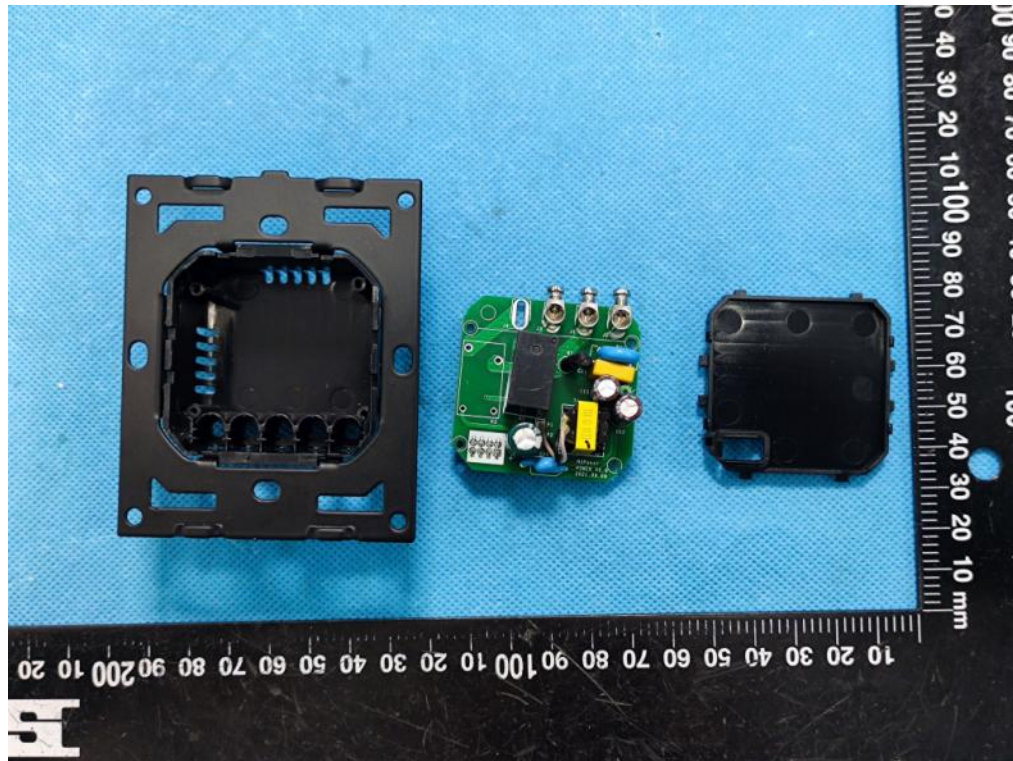


Photo 5 Uncover view(Model: M5-1C-80)

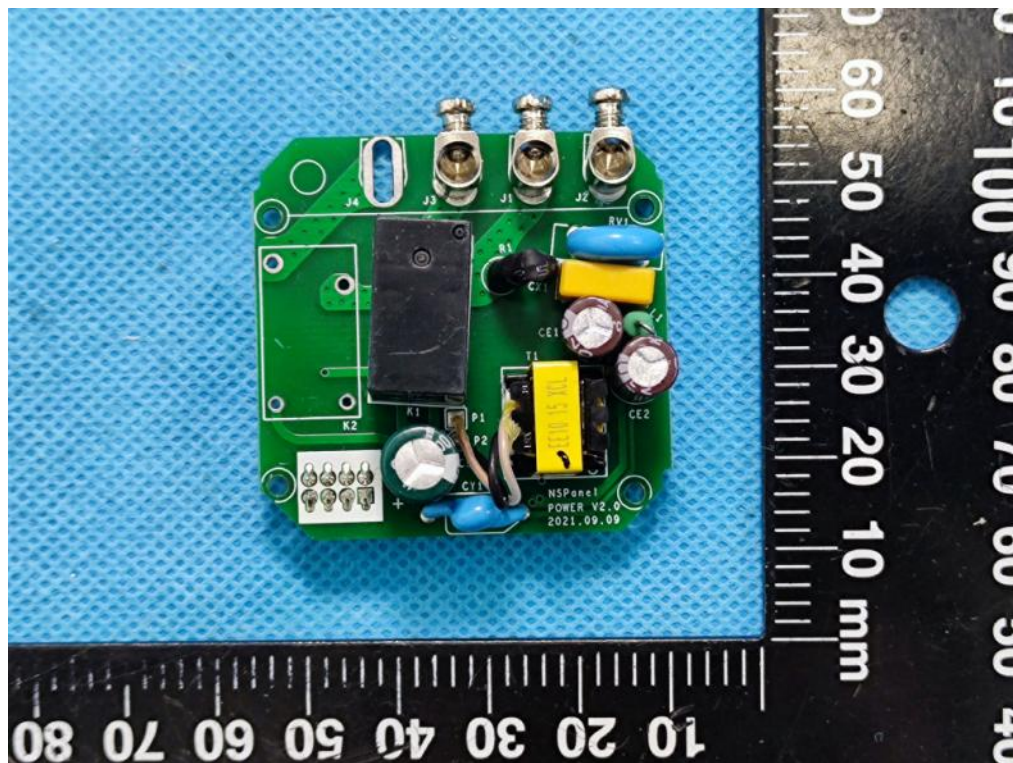


Photo 6 PCB top view of power bard(Model: M5-1C-80)

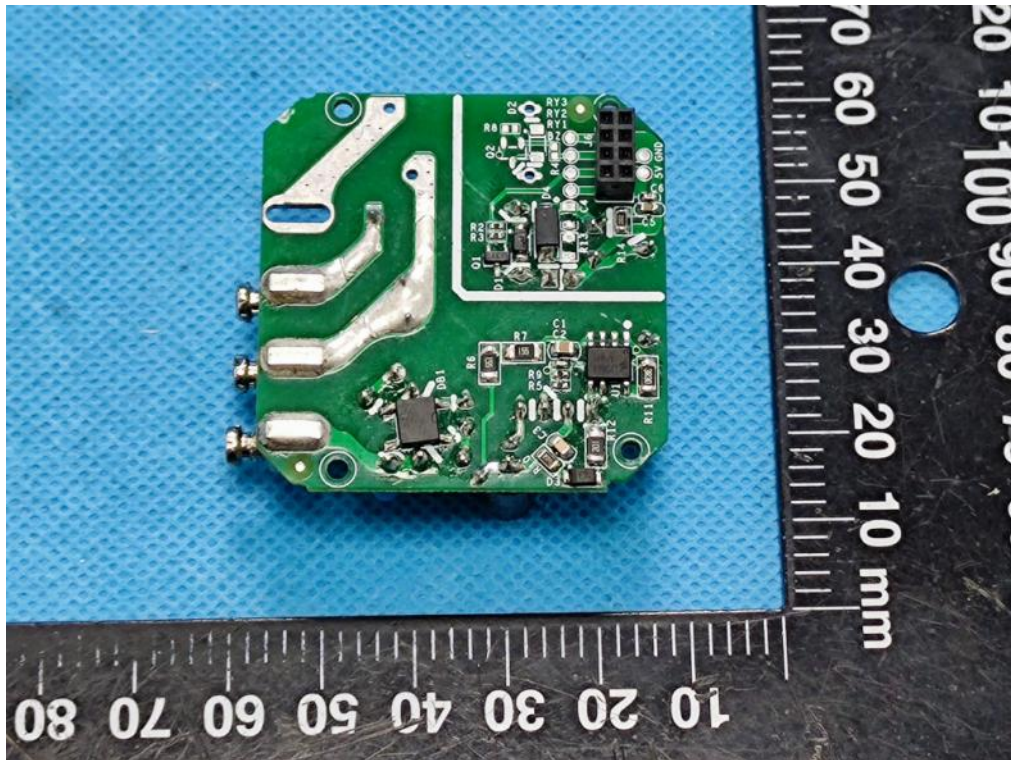


Photo 7 PCB bottom view of power board(Model: M5-1C-80)

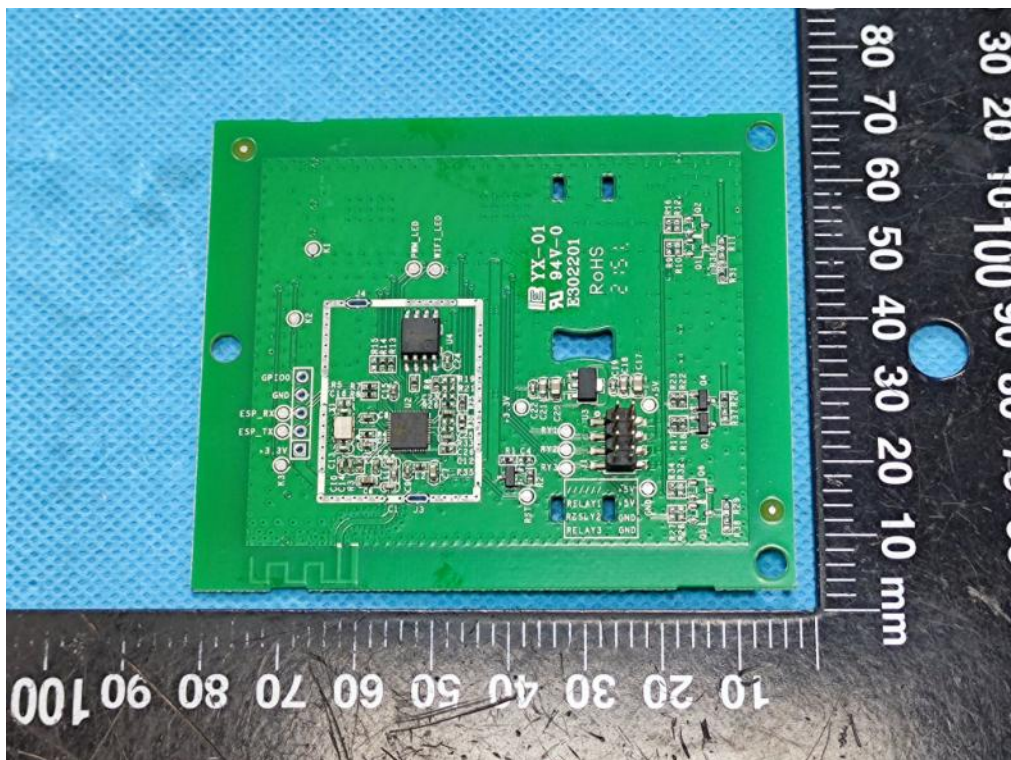


Photo 8 PCB top view of control board (Model: M5-1C-80)

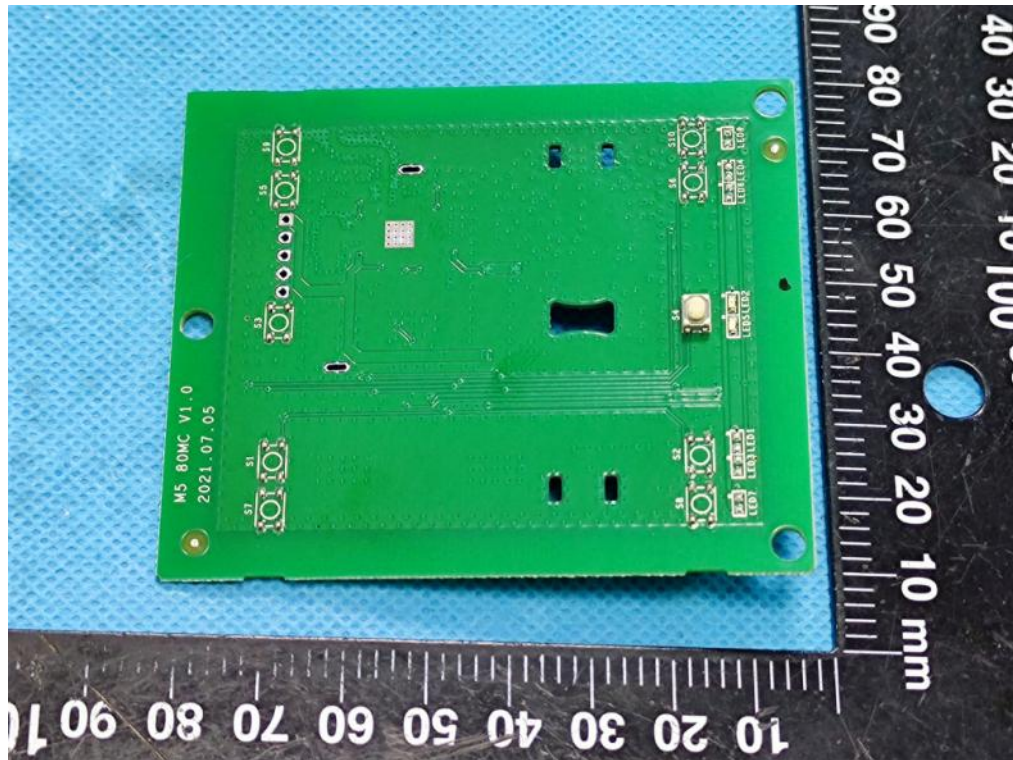


Photo 9 PCB bottom view of control board (Model: M5-1C-80)

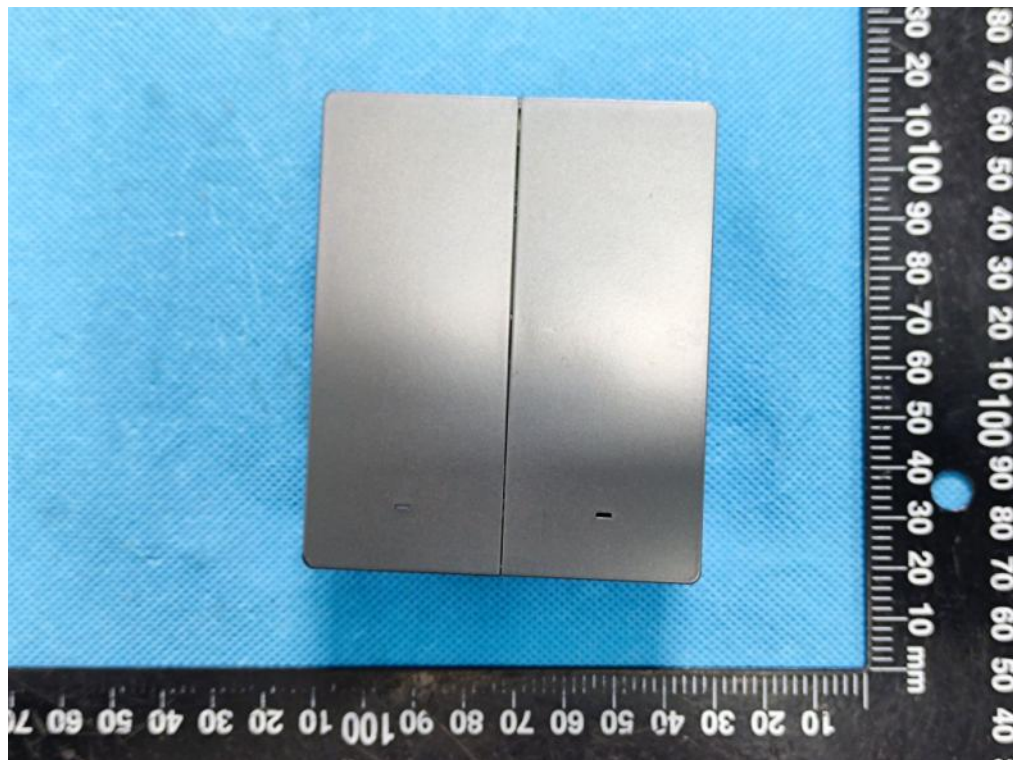


Photo 10 Top view (Model: M5-2C-80)



Photo 11 back view(Model: M5-2C-80)

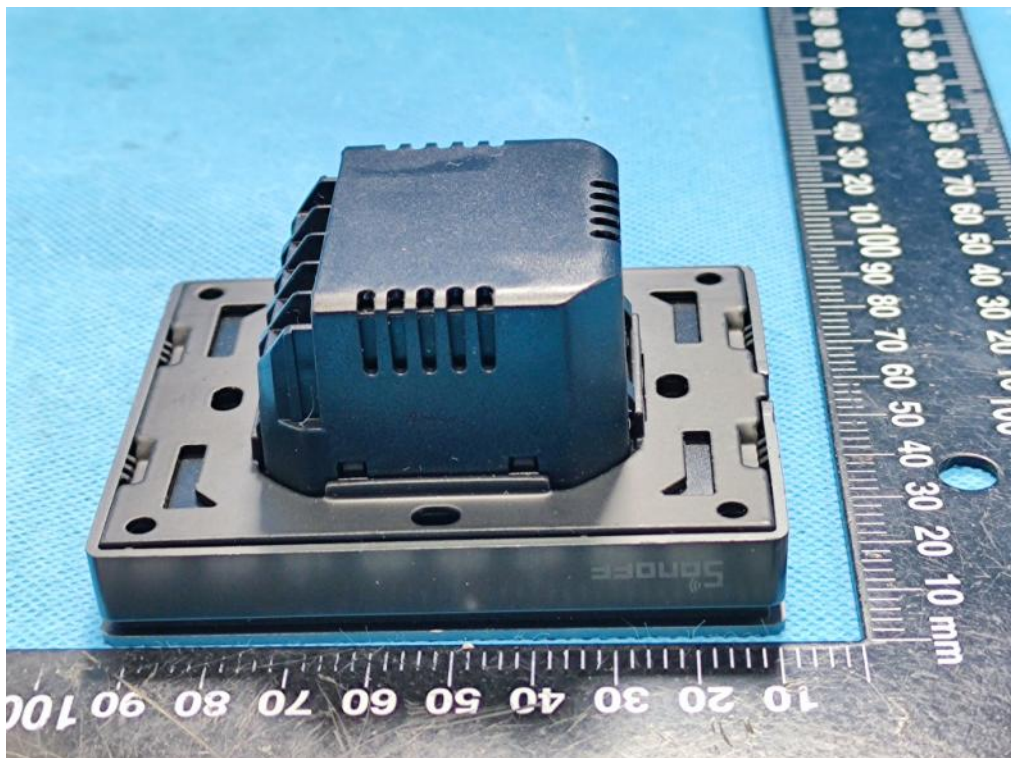


Photo 12 Side view(Model: M5-2C-80)

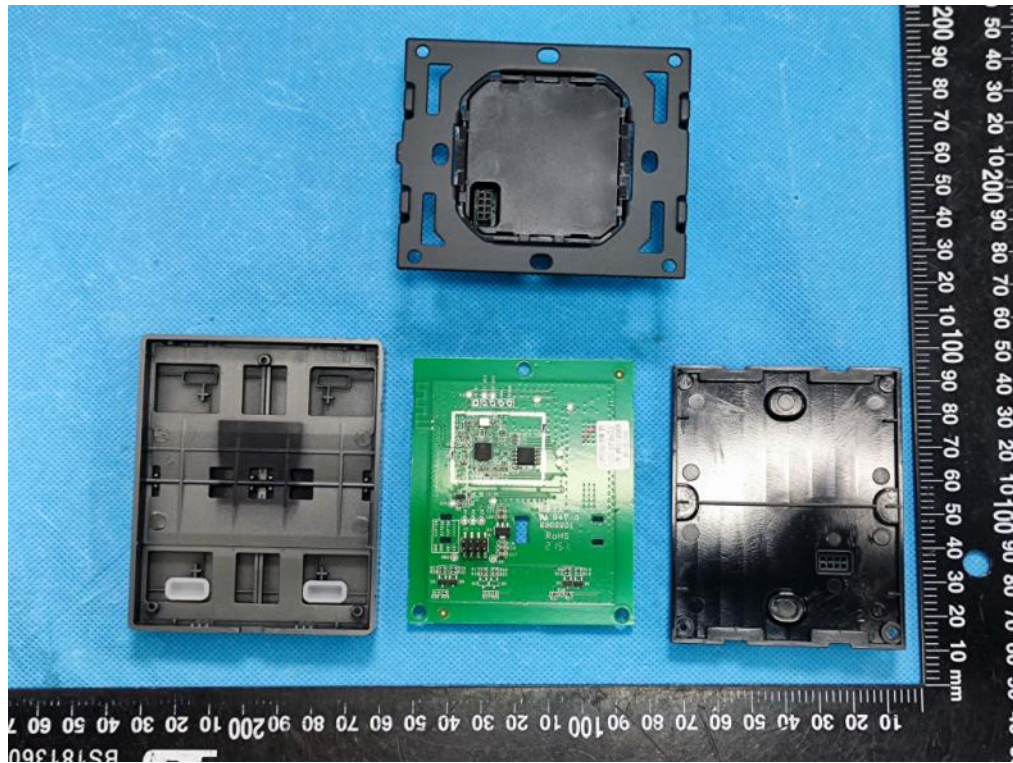


Photo 13 Uncover view(Model: M5-2C-80)

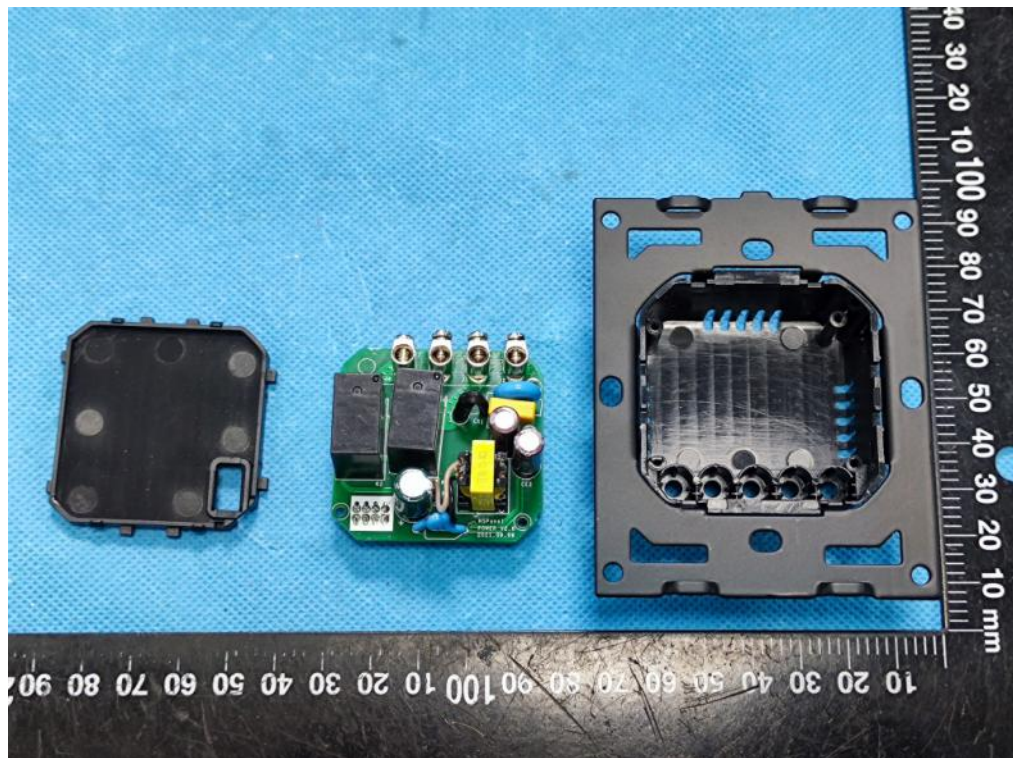


Photo 14 Uncover view(Model: M5-2C-80)

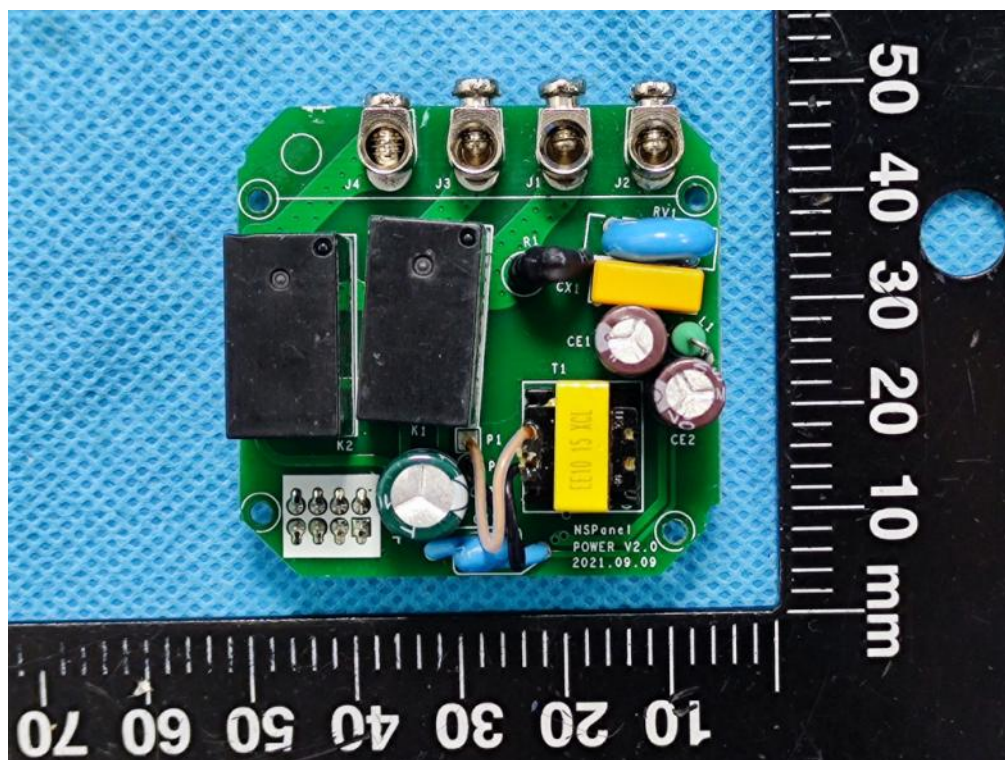


Photo 15 PCB top view of power bard(Model: M5-2C-80)

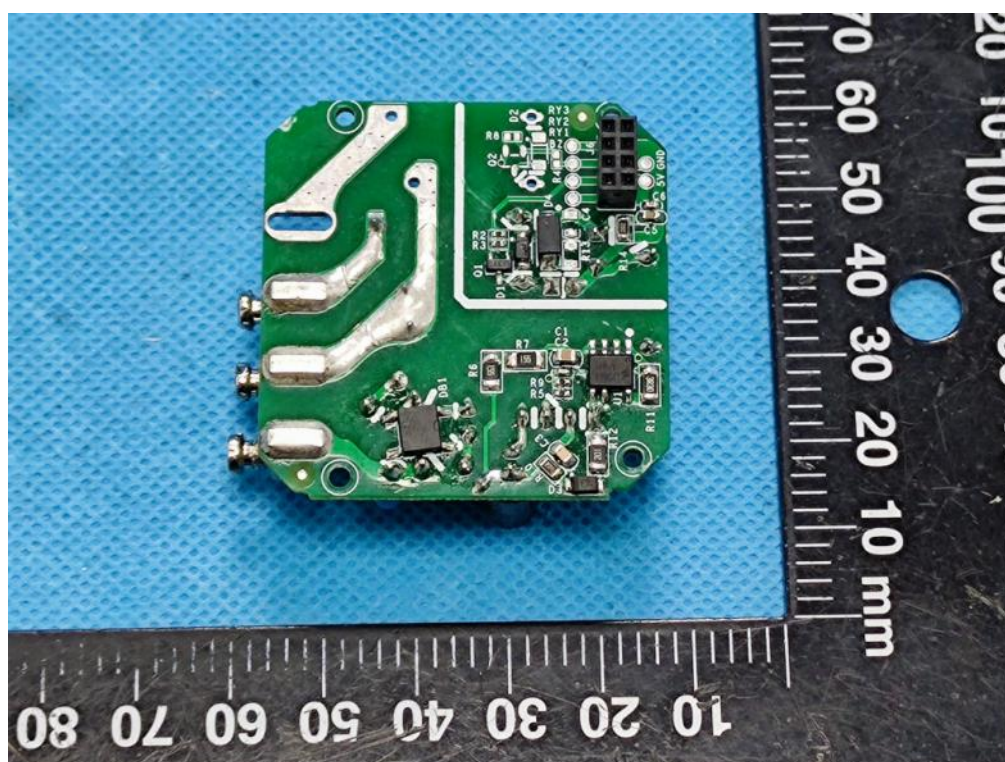


Photo 16 PCB bottom view of power board(Model: M5-2C-80)

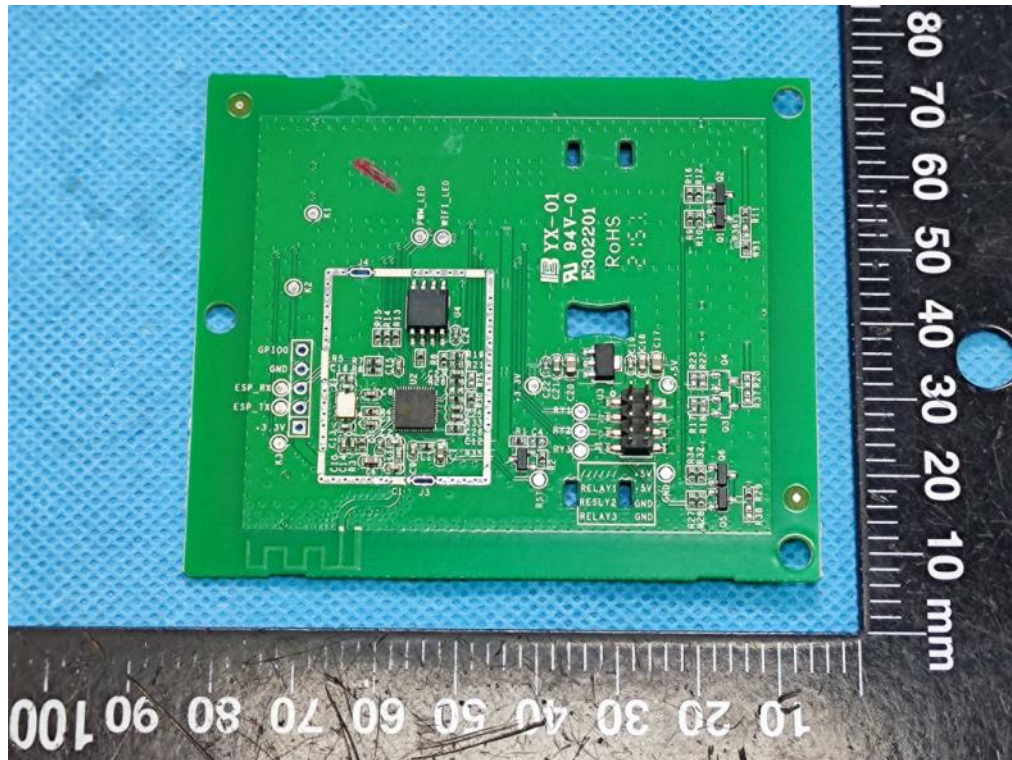


Photo 17 PCB top view of control board (Model: M5-2C-80)

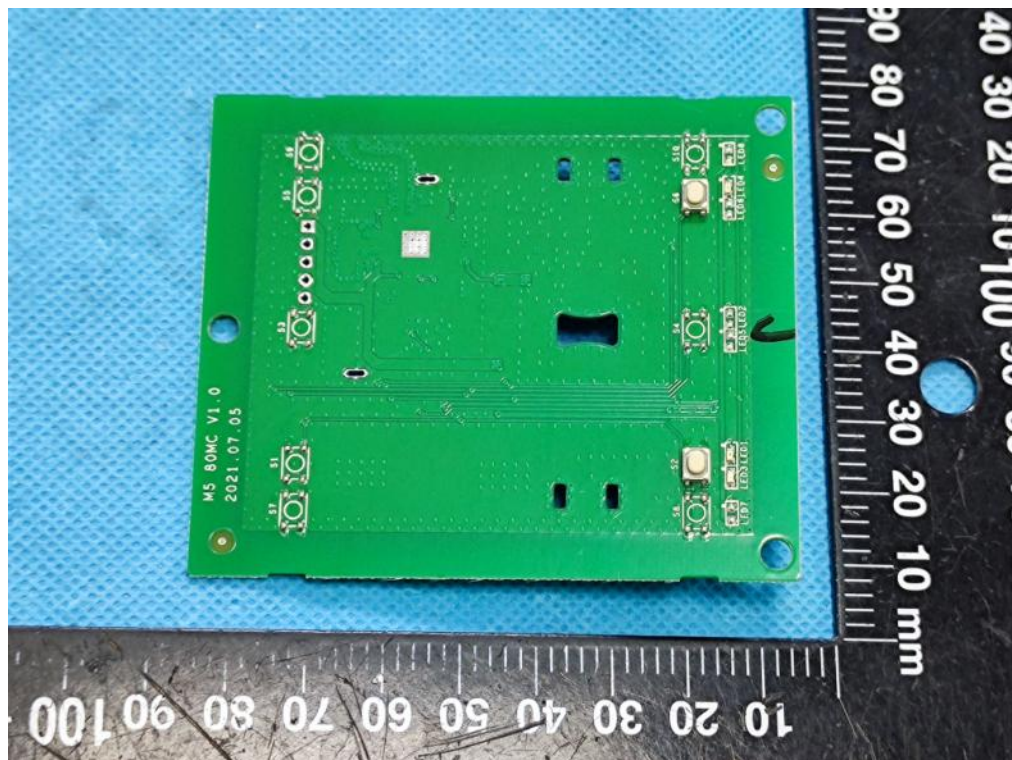


Photo 18 PCB bottom view of control board (Model: M5-2C-80)

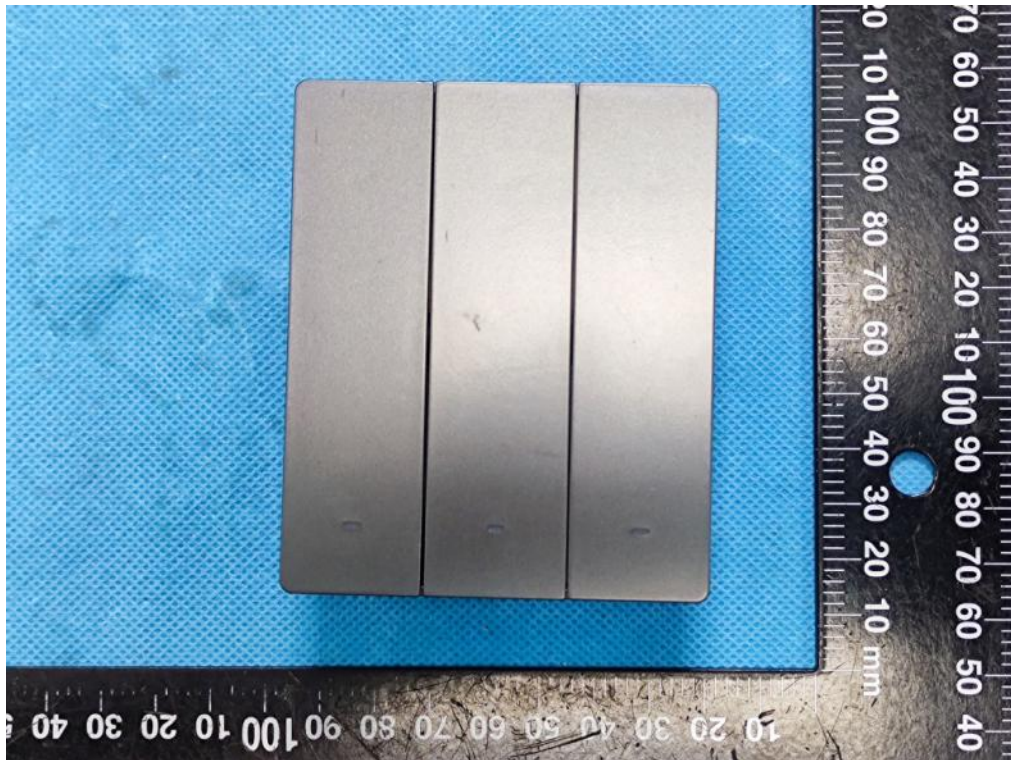


Photo 19 Top view(Model: M5-3C-80)

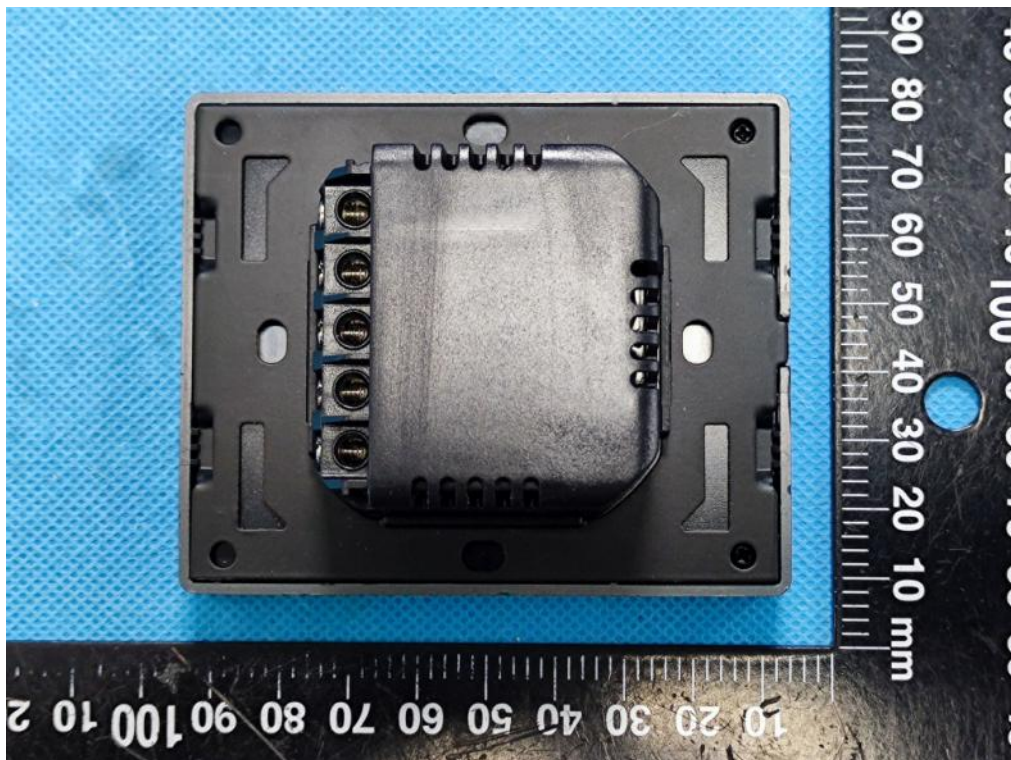


Photo 20 back view(Model: M5-3C-80)



Photo 21 Side view(Model: M5-3C-80)

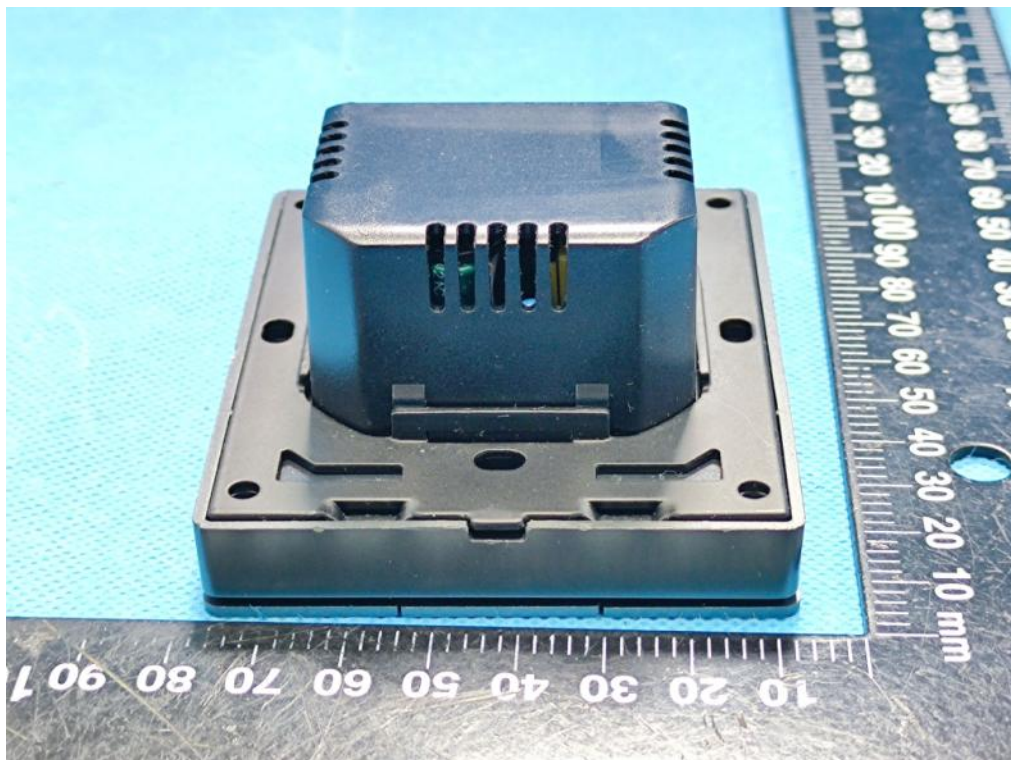


Photo 22 Side view(Model: M5-3C-80)

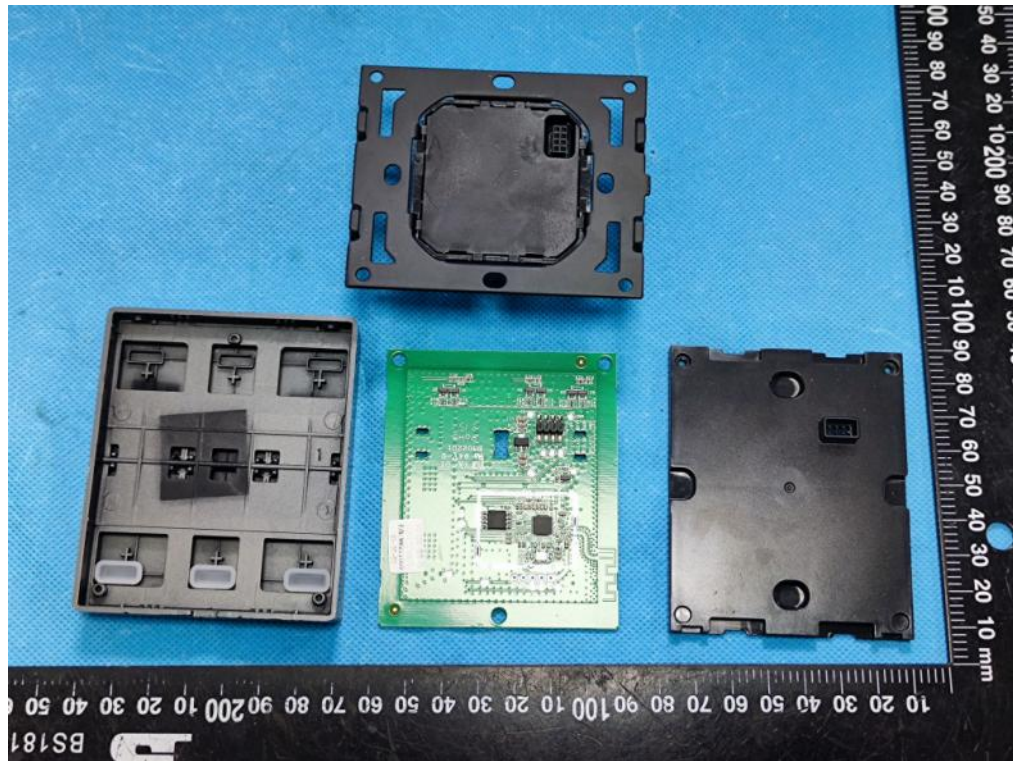


Photo 23 Uncover view(Model: M5-3C-80)

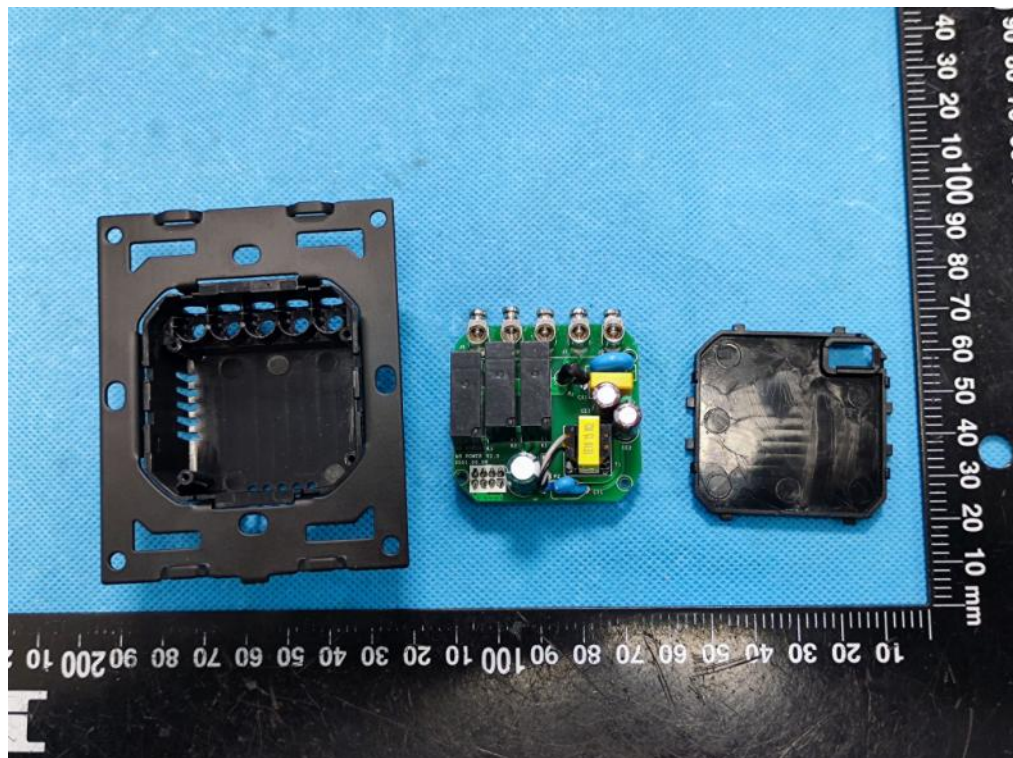


Photo 24 Uncover view(Model: M5-3C-80)

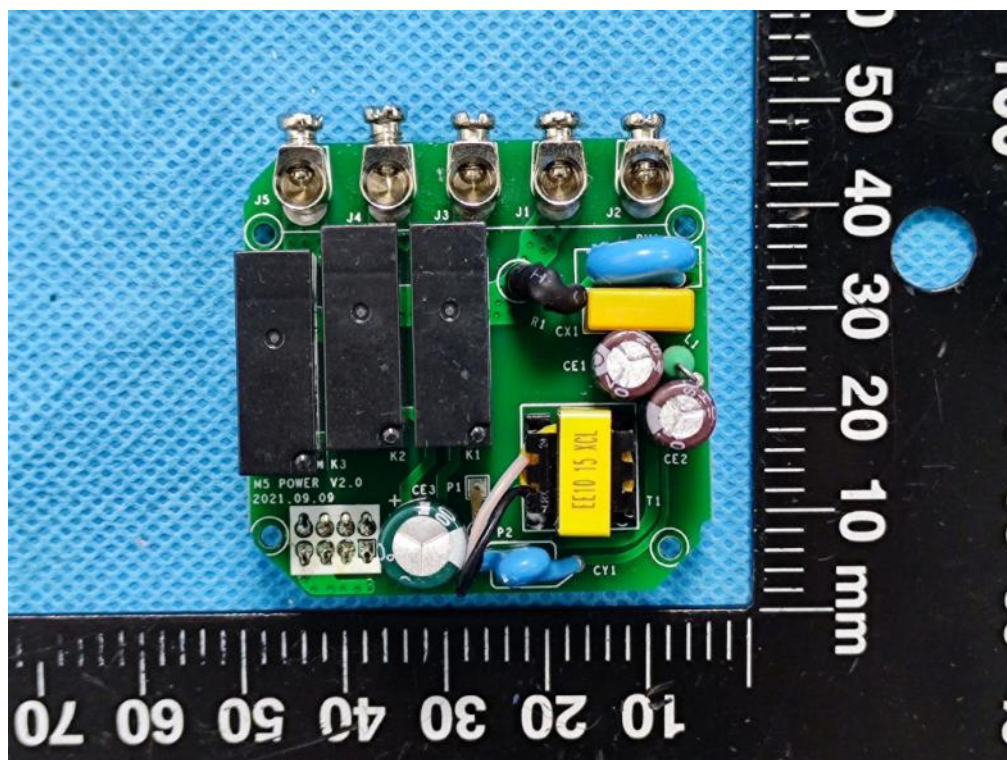


Photo 25 PCB top view of power bard(Model: M5-3C-80)

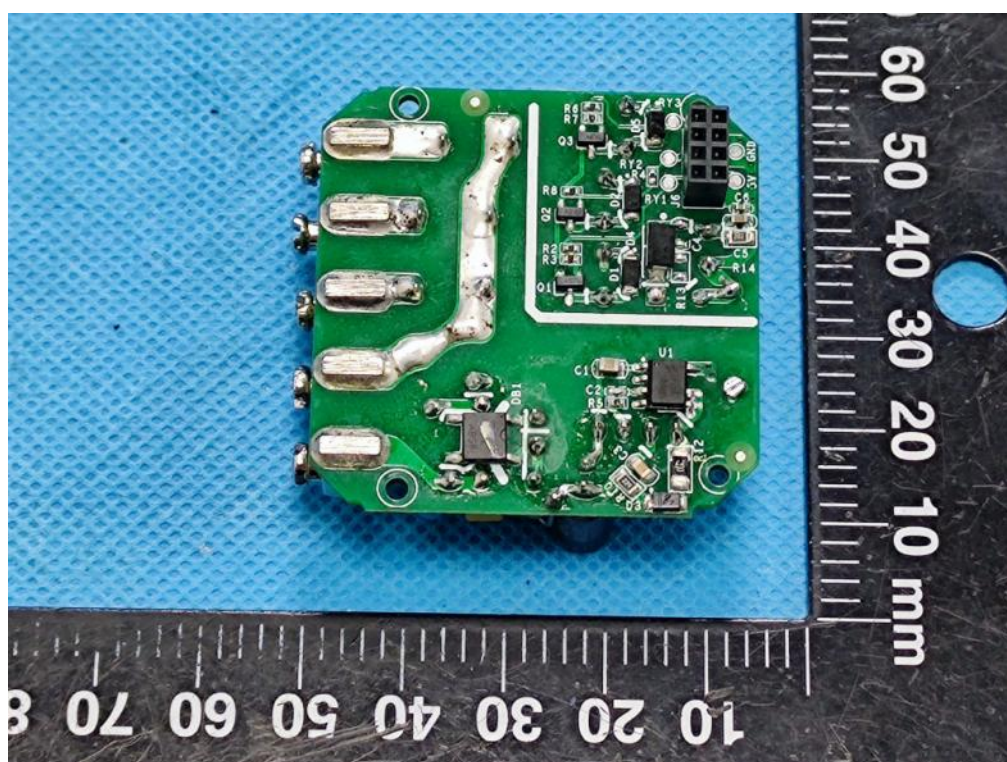


Photo 26 PCB bottom view of power baard(Model: M5-3C-80)

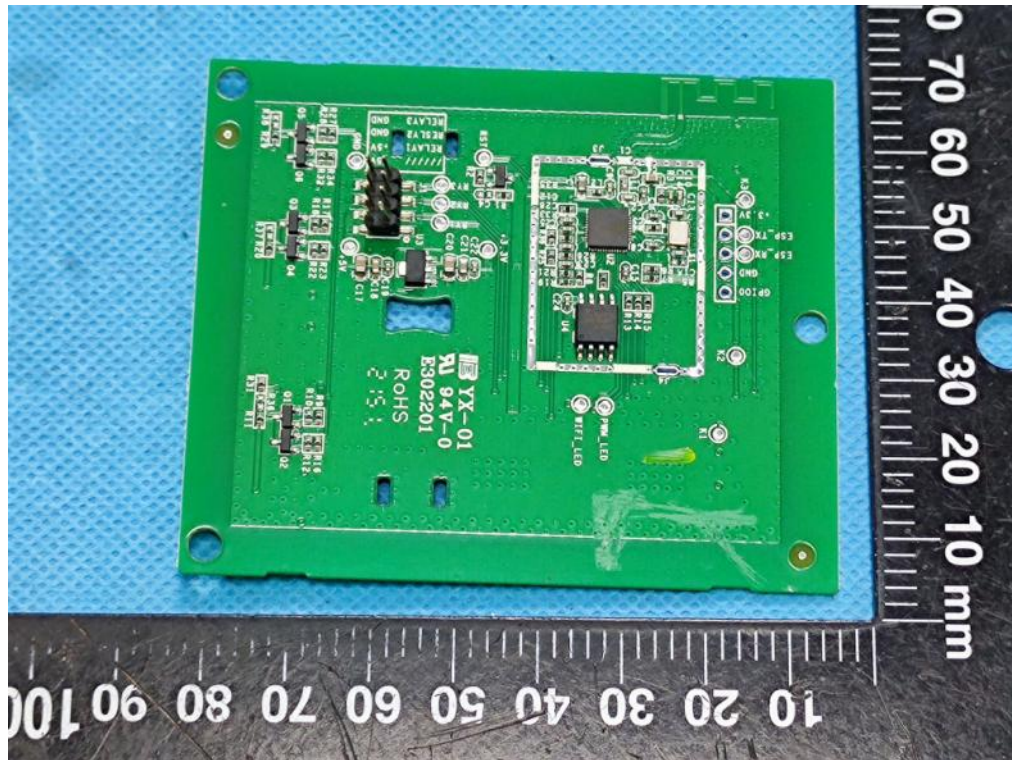


Photo 27 PCB top view of control board(Model: M5-3C-80)

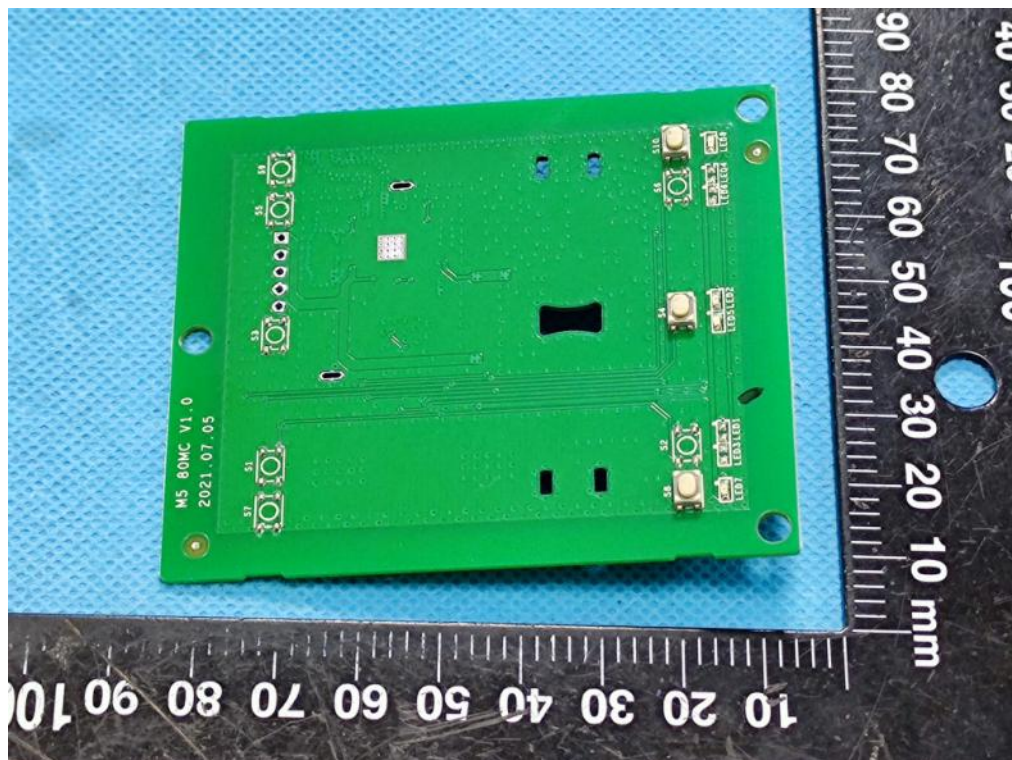


Photo 28 PCB bottom view of control board(Model: M5-3C-80)

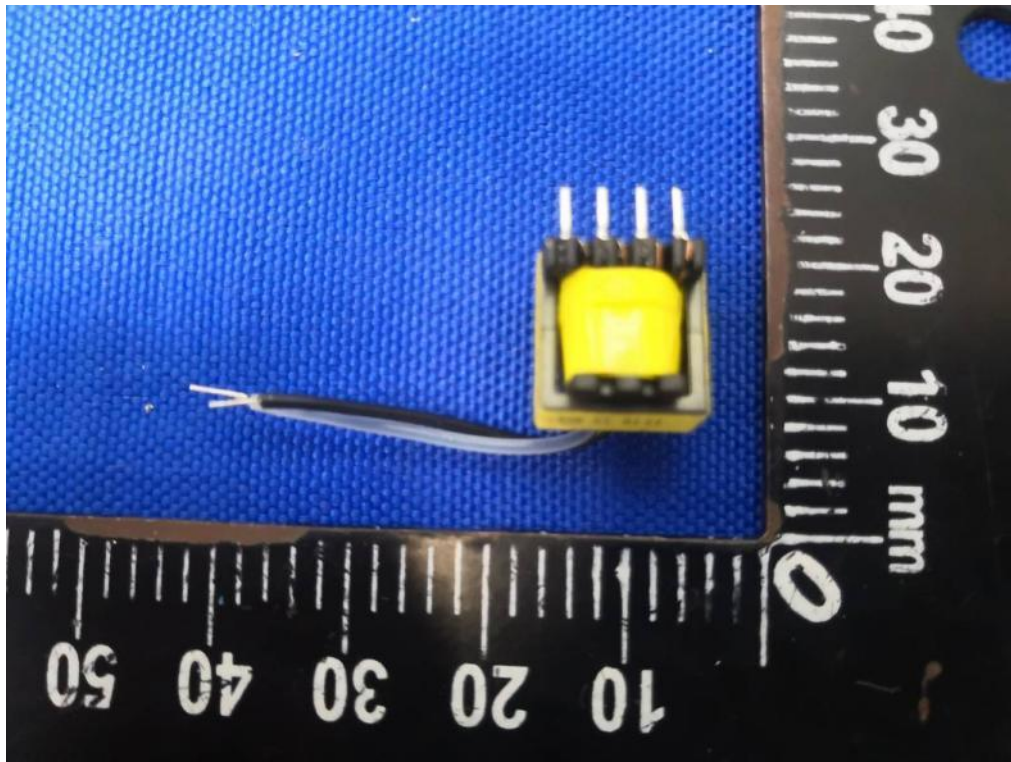


Photo 29 Transformer view

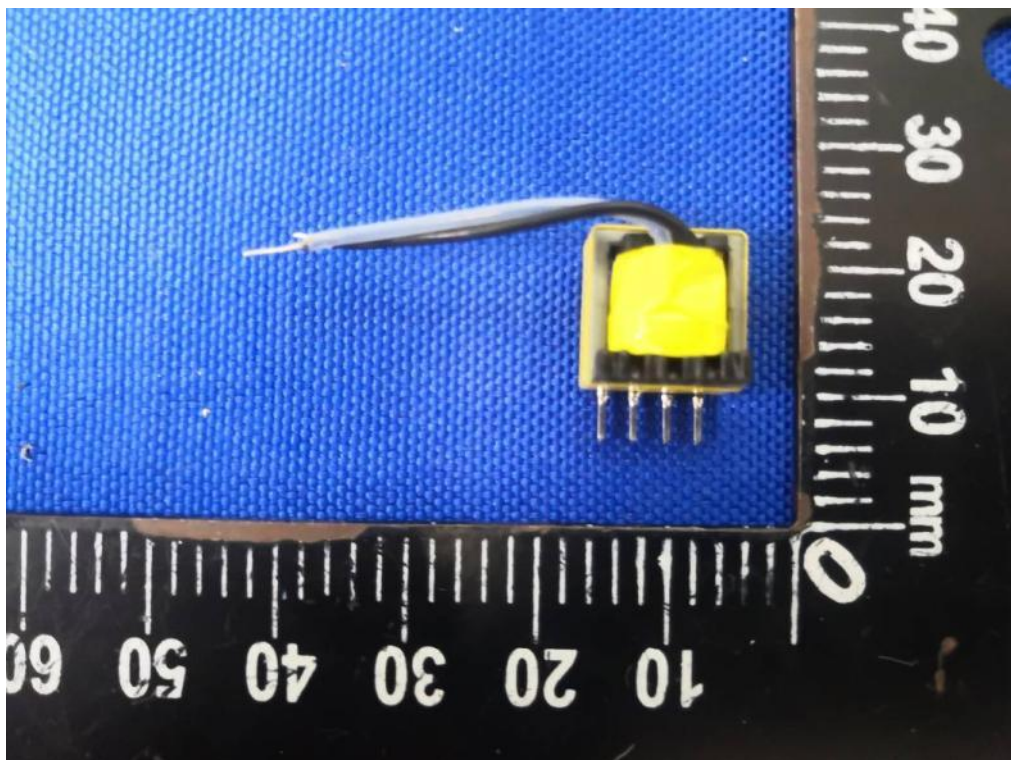


Photo 30 Transformer view

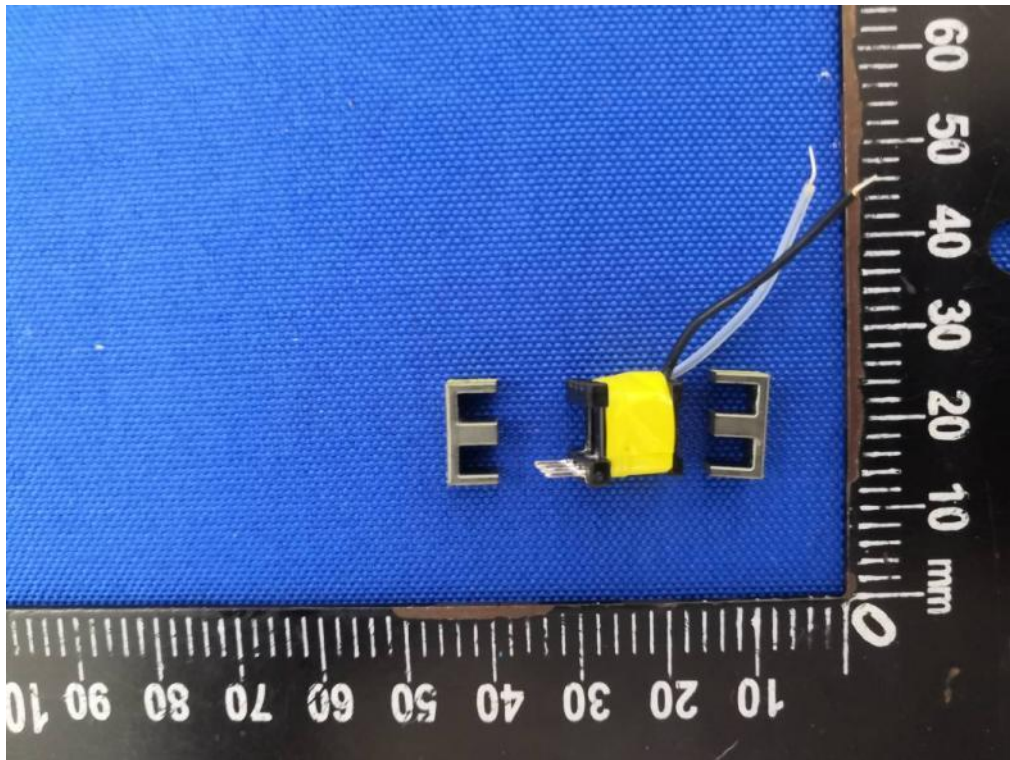


Photo 31 Transformer uncover view

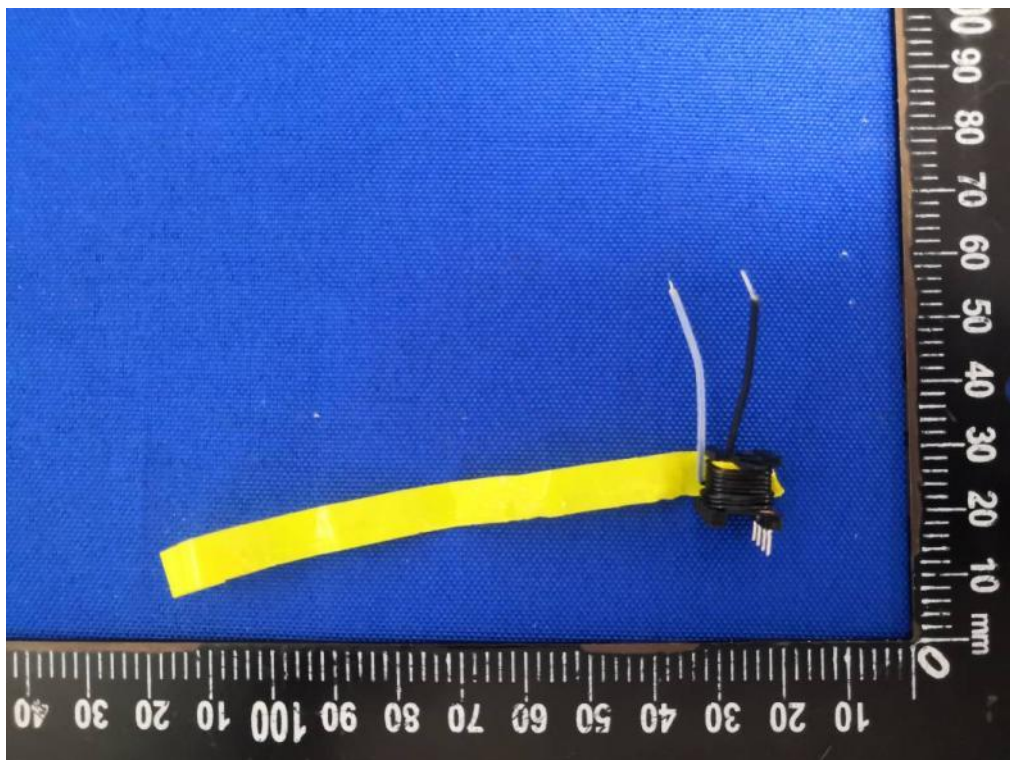


Photo 32 Transformer uncover view

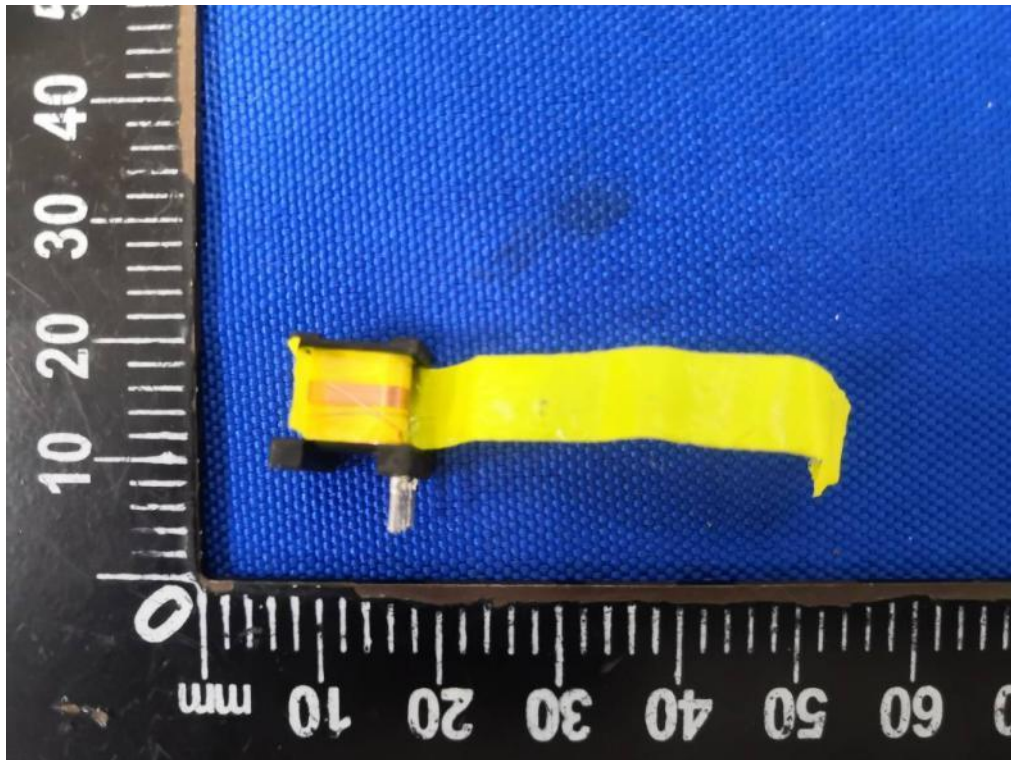


Photo 33Transformer uncover view

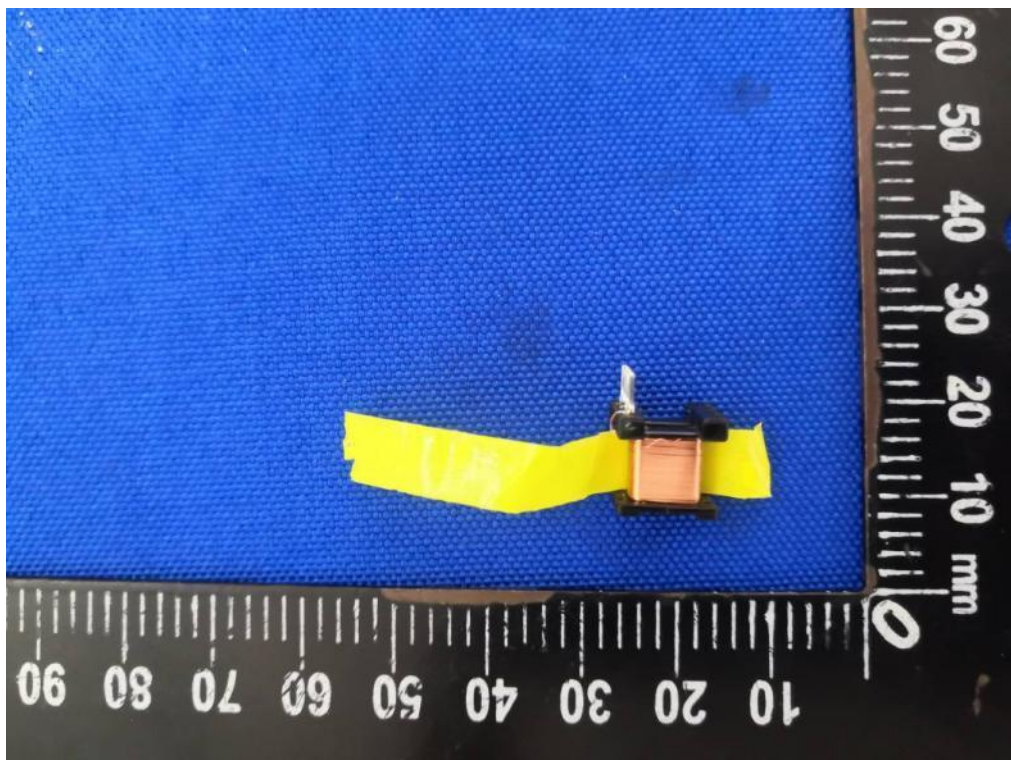


Photo 34Transformer uncover view

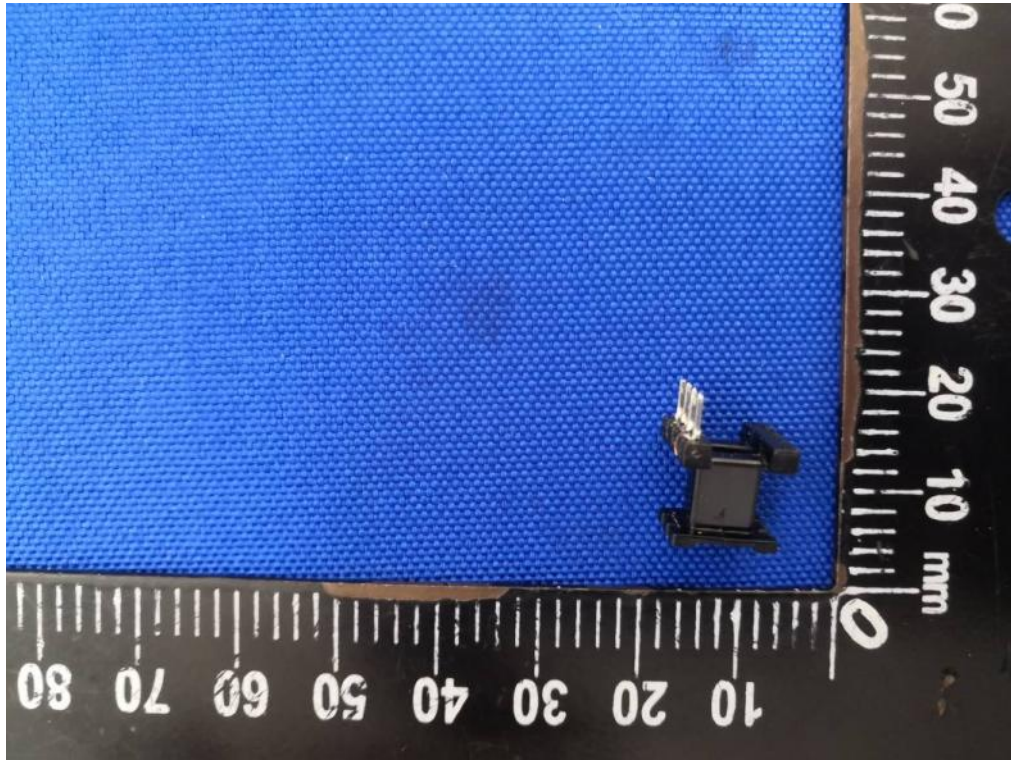


Photo 35Transformer uncover view

Appendix B- Declaration of Similarity



Shenzhen Sonoff Technologies Co.,Ltd.

Add: 3F & 6F, Bldg A, No. 663, Bulong Rd, Shenzhen, Guangdong, China

Tel: 0755-27955416 Fax: 0755-27955416

E-mail: cert@itead.cc

DECLARATION OF SIMILARITY

Date: 2022-07-04

To Whom It May Concern

Dear Sir or Madam:

We, Shenzhen Sonoff Technologies Co.,Ltd., hereby declare that product: SONOFF SwitchMan Smart Wall Switch, The model M5-1C-80W, M5-2C-80W, M5-3C-80W, M5-1C-80G, M5-2C-80G, M5-3C-80G are electrically identical with the model: M5-1C-80, M5-2C-80, M5-3C-80 which was tested by BACL(Dongguan) with the same electromagnetic emissions and electromagnetic compatibility characteristics.

The following is a description of the differences and declaration similarities between several configurations.

Model	Color	Relay	Gang(s)	PCB Board	
				Power supply board	RF&Control Board
M5-3C-80	black	Relay 1#	three	Different from 2C	Same (The RF part of the 3C series model is the same as the 2C series and 1C series models, but the PCBA of the control board is different)
M5-3C-80W	white	Relay 2#			
M5-3C-80G	golden	Relay 3#			
M5-2C-80	black	Relay 4# Relay 5#	two	/	
M5-2C-80W	white				
M5-2C-80G	golden				
M5-1C-80	black	Relay 4# Relay 5#	one	Same as 2C	
M5-1C-80W	white				
M5-1C-80G	golden				

The difference of the relay is described as follows:

Components	Manufacturer	Type/Model	Technical Data
Relay 1#	Shenzhen Golden Electrical Appliance Co Ltd.	Y5-1A -5DH 5DH	5A 250VAC
Relay 2#	Zhejiang Fanhar Electronics Co., Ltd.	W18-1AST-DC5V	DC5V 5A 250VAC
Relay 3#	SUZHOU GEEKO ELECTRICAPPLIANCES CO.,LTD	GK101-1AS-DC5V	5A 250 VAC
Relay 4#	Shenzhen Golden Electrical Appliance Co Ltd.	GI-1A-5LH	DC5V 10A 250VAC

Relay 5#	Zhejiang Fanhar Electronics Co., Ltd.	W11-1A2STLE-H-DC5V	DC5V 10A 250VAC
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Except the differences above, we declare the products are electrically identical. We guarantee all the information provided above is true, and notice that we'll bear all the consequences caused by any false information or concealing.

Please contact me should there be need for any additional clarification or information.

Best Regards,

Signature *Stan Li*

Name: Stan Lee
Hardware Department Manager

Appendix C- Directions

1. The information marked # is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report.
2. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.
3. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.
4. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.
5. This report cannot be reproduced except in full, without prior written approval of the Company.
6. This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

*****END OF REPORT*****