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

Report Number.....:	ZKS210200023-1
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Name of Testing Laboratory preparing the Report.....:	Dongguan ZRLK Testing Technology Co., Ltd.
Applicant's name.....:	Shenzhen wanmai technology innovation Co.,LTD
Address.....:	501,5th Fir.BLDG 4,Pingshan Minqi Technology Park,No.65 Lishan Road Pingshan Community,Taoyuan Street,Nanshan
Test specification:	
Standard.....:	EN 62368-1:2020+A11:2020
Non-standard test method.....:	N/A
TRF template used.....:	IECEE OD-2020-F1:2020, Ed.1.3
Test Report Form No.....:	IEC62368_1E
Test Report Form(s) Originator.....:	UL(US)
Master TRF.....:	Dated 2021-02-04

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Test item description :	Portable Power Station
Trade Mark.....:	/
Manufacturer.....:	Shenzhen wanmai technology innovation Co.,LTD 501,5th Fir.BLDG 4,Pingshan Minqi Technology Park,No.65 Lishan Road Pingshan Community,Taoyuan Street,Nanshan
Model/Type reference.....:	Vickers 500
Ratings.....:	Input: 18V⎓/4A; USB1 & USB2 (QC3.0) Output: 5V⎓/3A, 9V⎓/2A, 12V⎓/1.5A USB-C PD 60W: 5V⎓/3A, 9V⎓/3A, 12V⎓/3A,15V⎓/3A, 20V⎓/3A (In/Out); USB-C PD 18W: 5V⎓/3A, 9V⎓/2A, 12V⎓/1.5A DC*1+Cig*1. Output: 12V⎓/8A AC Output: 230Vac, 50Hz, 500W Battery Capacity: 150000mAh, 555Wh

Summary of testing:

Tests performed (name of test and test clause):

The submitted samples were tested and found to comply with the requirements of:

EN 62368-1:2020+A11:2020

All applicable tests as described in Test Case and Measurement Sections were performed.

Maximal ambient temperature as specified by the manufacturer: +40°C

Load conditions used during testing see appended table B.2.5 for details.

5.4.1.4, 9.3, B.1.5, B.2.6	Temperature measurements
5.2	Classification of electrical energy sources
5.3.2	Accessibility to electrical energy sources and safeguards
5.4.1.8	Working voltage measurement
5.4.2, 5.4.3	Minimum Clearances/Creepage distance
5.4.4.9	Solid insulation at frequencies
5.4.8	Humidity conditioning
5.4.9	Electric strength tests
6.2.2	Power source circuit classifications
9.2	Thermal energy source classifications
B.2.5	Input test
B.3, B.4	Abnormal operating and fault condition tests
F.3.9	Durability, legibility and permanence of marking
M.3	Protection circuits for batteries provided within the equipment
Q.1	Circuits intended for interconnection with building wiring (LPS)
T.4	Steady force test, 100 N
T.5	Steady force test, 250N
T.7	Drop test
T.8	Stress relief test

Testing location:

Dongguan ZRLK Testing Technology Co., Ltd.

Building D, No.2, Jinyuyuan Mansion, No.18, Industrial West Road, Songshan Lake High-tech Industrial Development Zone, Dongguan, Guangdong, China

Summary of compliance with National Differences (List of countries addressed):

EU Group Differences, EU Special National Conditions

For National Differences see attachment 1.

☒ The product fulfils the requirements of EN IEC 62368-1:2020+A11:2020.

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.

Portable Power Station

Model: Vickers 500

Input: 18V⎓/4A;

USB1 & USB2 (QC3.0) Output: 5V⎓/3A, 9V⎓/2A, 12V⎓/1.5A

USB-C PD 60W: 5V⎓/3A, 9V⎓/3A, 12V⎓/3A, 15V⎓/3A, 20V⎓/3A (In/Out);

USB-C PD 18W: 5V⎓/3A, 9V⎓/2A, 12V⎓/1.5A

DC*1+Cig*1. Output: 12V⎓/8A

AC Output: 230Vac, 50Hz, 500W

Battery Capacity: 37500mAh, 14.8V, 555Wh

Shenzhen wanmai technology innovation Co.,LTD

501,5th Fir.BLDG 4,Pingshan Minqi Technology Park,No.65 Lishan Road Pingshan Community,Taoyuan Street,Nanshan

Importer name in EU: XXX

Importer Address in EU: XXX

Made in China

Remark: According to the EU directives which have been aligned with EU NLF (new legislative framework), both of manufacturer and importer's name and address shall be affixed on the product or, where that is not possible, on its packaging or in a document accompanying the product before the product is placed on the EU market.

Remark: Minimum height of CE mark is 5mm, minimum height of WEEE mark is 7mm.

Test item particulars:	
Product group ..... :	☒ end product ☐ built-in component
Classification of use by..... :	☒ Ordinary person ☒ Children likely present ☐ Instructed person ☐ Skilled person
Supply connection..... :	☐ AC mains ☐ DC mains ☒ not mains connected: Supplied by Max. 20.0VDC ☒ ES1 ☐ ES2 ☒ ES3
Supply tolerance ..... :	☐ +10%/-10% ☐ +20%/-15% ☐ +____%/ -____% ☒ None
Supply connection – type ..... :	☐ pluggable equipment type A - ☐ non-detachable supply cord ☐ appliance coupler ☐ direct plug-in ☐ pluggable equipment type B - ☐ non-detachable supply cord ☐ appliance coupler ☐ permanent connection ☐ mating connector ☒ other: not directly connected to the mains
Considered current rating of protective device..... :	☐ ____A; Location: ☐ building ☐ equipment ☒ N/A
Equipment mobility..... :	☐ movable ☐ hand-held ☒ transportable ☐ direct plug-in ☐ stationary ☐ for building-in ☐ wall/ceiling-mounted ☐ SRME/rack-mounted ☐ other:
Overvoltage category (OVC) ..... :	☐ OVC I ☒ OVC II ☐ OVC III ☐ OVC IV ☒ other: Supplied by Max. 20VDC
Class of equipment ..... :	☐ Class I ☒ Class II ☐ Class III ☒ Not classified ☐ ____
Special installation location ..... :	☒ N/A ☐ restricted access area ☐ outdoor location ☐ ____
Pollution degree (PD) ..... :	☐ PD 1 ☒ PD 2 ☐ PD 3
Manufacturer's specified T_{ma}..... :	40°C ☐ Outdoor: minimum ____ °C
IP protection class ..... :	☒ IPX0 ☐ IP___
Power systems ..... :	☐ TN ☐ TT ☐ IT - ____ V_{L-L} ☒ not AC mains
Altitude during operation (m) ..... :	☒ 2000 m or less ☐ ____ m
Altitude of test laboratory (m) ..... :	☒ 2000 m or less ☐ ____ m
Mass of equipment (kg) ..... :	Approx. 4.595kg

Possible test case verdicts:	
- test case does not apply to the test object.... :	N/A
- test object does meet the requirement..... :	P (Pass)
- test object does not meet the requirement.... :	F (Fail)
Testing:	
Date of receipt of test item..... :	Feb. 02, 2021
Date (s) of performance of tests.....:	Feb. 02, 2021 to June. 22, 2021

General remarks:

"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.

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

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

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided..... :	☐ **Yes** ☒ **Not applicable**

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies).....:	Shenzhen Dawei Innovation Co., Ltd. 2nd Floor, Building G, Pioneer Park, Fenghuang 3rd Industrial Park, Fuyong Street, Shenzhen City, China

General product information and other remarks:

1. The product covered in this report is Portable Power Station which is intended used in audio/video information or communication technology equipment.
2. The Component cells INR18650S-2500mAh inside the battery pack is CB approved according to IEC 62133-2: 2017(CB Report No.: SZES190801518201)
3. The Energy storage power cannot be discharged while being charged.
4. As the applicant declares, the Max. operation temperature is 40°C.

The Energy storage power mainly composed of:
-Protective Circuit Module
-Li-ion cells (4S15P)
-Plastic enclosure
-DC input terminal, USB connector, Type-C connector, DC Jacket connector, AC Socket output; (only one input terminal, Six DC output terminals and two AC Output)

The main features of the Energy storage power are shown as below:

Model	Nominal capacity	Nominal voltage	Nominal Charge Current	Nominal Discharge Current	Maximum Charge Current	Maximum Discharge Current	Maximum Charge Voltage	Cut-off Voltage
DW501	Battery Capacity: 150000mAh	20V⎓	4A	Input: 18V⎓/4A; USB1 & USB2 (QC3.0) Output: 5V⎓/3A, 9V⎓/2A, 12V⎓/1.5A USB-C PD 60W: 5V⎓/3A, 9V⎓/3A, 12V⎓/3A, 15V⎓/3A, 20V⎓/3A (In/Out); USB-C PD 18W: 5V⎓/3A, 9V⎓/2A, 12V⎓/1.5A DC*1+Cig*1. Output: 12V⎓/8A AC Output: 230Vac, 50Hz, 500W	2.4A	18V⎓/4A; USB1 & USB2 (QC3.0) Output: 5V⎓/3A, 9V⎓/2A, 12V⎓/1.5A USB-C PD 60W: 5V⎓/3A, 9V⎓/3A, 12V⎓/3A, 15V⎓/3A, 20V⎓/3A (In/Out); USB-C PD 18W: 5V⎓/3A, 9V⎓/2A, 12V⎓/1.5A DC*1+Cig*1. Output: 12V⎓/8A AC Output: 230Vac, 50Hz, 500W	15V⎓	8.25V

The main features of the cell in the Energy storage power/Lithium-ion Battery Pack are shown as below

Model	Nominal capacity	Nominal voltage	Nominal Charge Current	Nominal Discharge Current	Maximum Charge Current	Maximum Discharge Current	Maximum Charge Voltage	Cut-off Voltage
INR18650S-2500mAh	2500mAh	3.6V	2500mA	1250mA	1250mA	7500mA	4.2V	2.75V

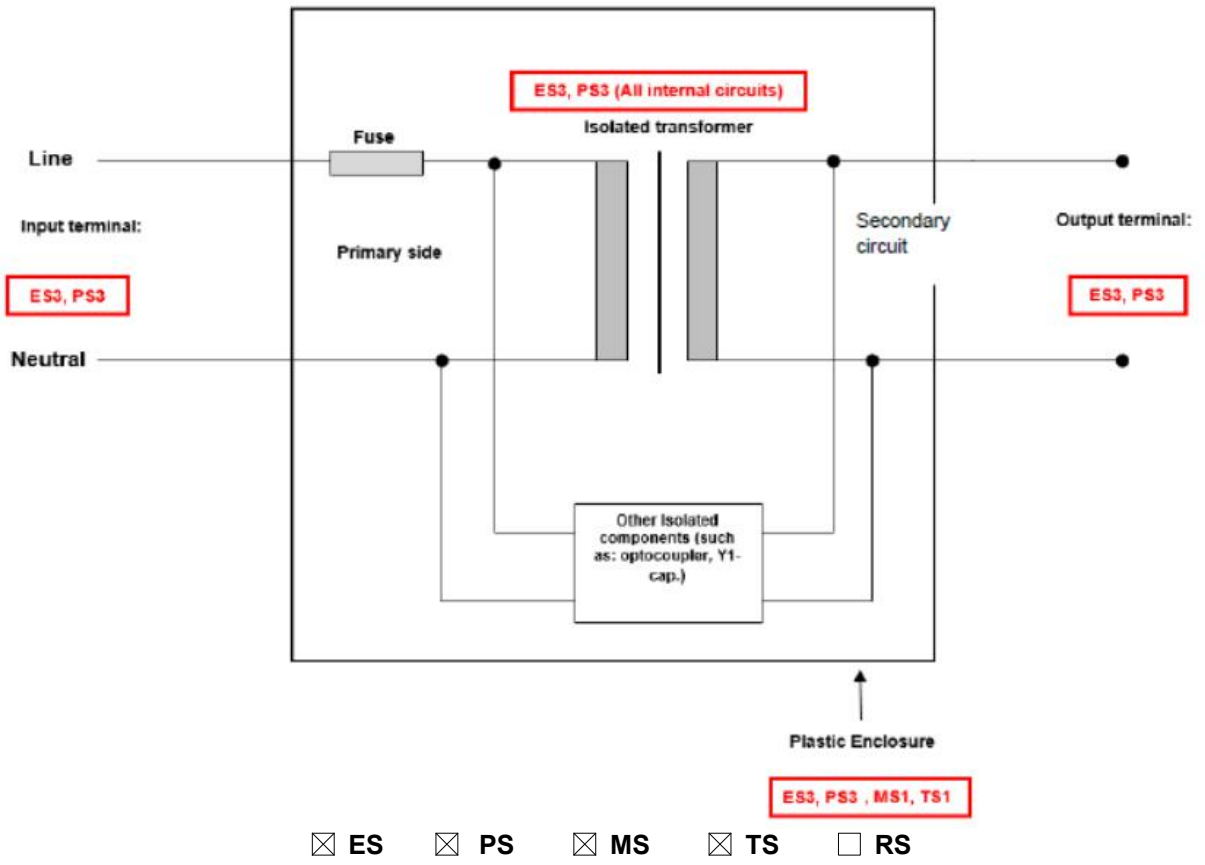
The main features of the cell in the Energy storage power/Lithium-ion Battery Pack are shown as below:

Model	Upper limit charge voltage	Taper-off current	Lower charge temperature	Upper charge temperature
INR18650S-2500mAh	4.25V	125mA	0°C	45°C

ENERGY SOURCE IDENTIFICATION AND CLASSIFICATION TABLE:	
(Note 1: Identify the following six (6) energy source forms based on the origin of the energy.) (Note 2: The identified classification e.g., ES2, TS1, should be with respect to its ability to cause pain or injury on the body or its ability to ignite a combustible material. Any energy source can be declared Class 3 as a worse case classification e.g. PS3, ES3.	
Electrically-caused injury (Clause 5): (Note: Identify type of source, list sub-assembly or circuit designation and corresponding energy source classification) Example: +5 V dc input ES1	
Source of electrical energy	**Corresponding classification (ES)**
Primary circuit supplied by DC mains	ES1
DC*1+Cig*1Output: 12.33V⎓/8A Output connector (DC output)	ES1
USB-C PD 60W: 5V⎓/3A, 9V⎓/3A, 12V⎓/3A, 15V⎓/3A, 20V⎓/3A (In/Out);	ES1
USB1 & USB2 (QC3.0) Output: 5V⎓/3A, 9V⎓/2A, 12V⎓/1.5A	ES1
USB-C PD 18W: 5V⎓/3A, 9V⎓/2A, 12V⎓/1.5A	ES1
AC Output: 230Vac, 50Hz, 500W	ES3
Electrically-caused fire (Clause 6): (Note: List sub-assembly or circuit designation and corresponding energy source classification) Example: Battery pack (maximum 85 watts): PS2	
Source of power or PIS	**Corresponding classification (PS)**
Primary circuit	PS3, Arching PIS, Resistive PIS
All output connector	PS3
Injury caused by hazardous substances (Clause 7) (Note: Specify hazardous chemicals, whether produces ozone or other chemical construction not addressed as part of the component evaluation.) Example: Liquid in filled component Glycol	
Source of hazardous substances	**Corresponding chemical**
N/A (None)	N/A
Mechanically-caused injury (Clause 8) (Note: List moving part(s), fan, special installations, etc. & corresponding MS classification based on Table 35.) Example: Wall mount unit MS2	
Source of kinetic/mechanical energy	**Corresponding classification (MS)**
Edges and corners of enclosure	MS1
Mass of the unit	MS1
Thermal burn injury (Clause 9) (Note: Identify the surface or support, and corresponding energy source classification based on type of part, location, operating temperature and contact time in Table 38.) Example: Hand-held scanner – thermoplastic enclosure TS1	
Source of thermal energy	**Corresponding classification (TS)**
External surface (plastic)	TS1

ENERGY SOURCE IDENTIFICATION AND CLASSIFICATION TABLE:	
Radiation (Clause 10) (Note: List the types of radiation present in the product and the corresponding energy source classification.) Example: DVD – Class 1 Laser Product RS1	
Type of radiation	**Corresponding classification (RS)**
N/A	N/A

ENERGY SOURCE DIAGRAM
Indicate which energy sources are included in the energy source diagram. Insert diagram below



☒ ES ☒ PS ☒ MS ☒ TS ☐ RS

OVERVIEW OF EMPLOYED SAFEGUARDS				
Clause	**Possible Hazard**			
5.1	Electrically-caused injury			
Body Part (e.g. Ordinary)	Energy Source (ES3: Primary Filter circuit)	Safeguards		
		Basic	Supplementary	Reinforced (Enclosure)
ES1	DC Output terminal (Max. 20V dc output)	N/A	N/A	N/A
ES3	Inverter output circuits AC output 230Vac	N/A	N/A	Inverter, optocoupler, enclosure
6.1	Electrically-caused fire			
Material part (e.g. mouse enclosure)	Energy Source	Safeguards		
		Basic	Supplementary	Reinforced
PS3: 700 Watt circuit (Internal circuit)	PCB	Equipment safeguard (no ignition)	V-0	N/A
PS3: 700 Watt circuit (Internal circuit)	Plastic enclosure	Equipment safeguard (no ignition)	V-0	N/A
PS3: 700 Watt circuit (Internal circuit)	Internal wire	Equipment safeguard (no ignition)	VW-1	N/A
PS2: 96 Watt circuit (DC Output terminal)	Connected equipment (The output complies with L.P.S.)	N/A	N/A	N/A
7.1	Injury caused by hazardous substances			
Body Part (e.g., skilled)	Energy Source (hazardous material)	Safeguards		
		Basic	Supplementary	Reinforced
Cell:	Ordinary	N/A	N/A	See Annex T and comply with Annex M
8.1	Mechanically-caused injury			
Body Part (e.g. Ordinary)	Energy Source (MS3: High Pressure Lamp)	Safeguards		
		Basic	Supplementary	Reinforced (Enclosure)
Ordinary	MS1: Edges and corners	N/A	N/A	N/A
Ordinary	MS1: Mass of the unit	N/A	N/A	N/A
9.1	Thermal Burn –			
Body Part	Energy Source	Safeguards		

(e.g., Ordinary)	(TS2)	Basic	Supplementary	Reinforced
Ordinary	TS1: Plastic enclosure	N/A	N/A	N/A
10.1	Radiation			
Body Part (e.g., Ordinary)	Energy Source (Output from audio port)	Safeguards		
		Basic	Supplementary	Reinforced
RS1: LED classed	Ordinary	N/A	N/A	N/A
Supplementary Information: (1) See attached energy source diagram for additional details. (2) “N” – Normal Condition; “A” – Abnormal Condition; “S” Single Fault				

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Clause	Requirement + Test	Result - Remark	Verdict
4	**GENERAL REQUIREMENTS**		P
4.1.1	Acceptance of materials, components and subassemblies	See appended table 4.1.2	P
4.1.2	Use of components	Components which are certified to IEC and/or national standards are used correctly within their ratings. Components not covered by IEC standards are tested under the conditions present in the equipment. See also Annex G	P
4.1.3	Equipment design and construction	Evaluation of safeguards regarding preventing access to ES3 parts, limiting the source supplying outputs to ES1, and protection in regard to risk of ignition, mechanical-caused injury and thermal burn considered.	P
4.1.4	Specified ambient temperature for outdoor use (°C) ..... :		N/A
4.1.5	Constructions and components not specifically covered		N/A
4.1.8	Liquids and liquid filled components (LFC)	Not such product.	N/A
4.1.15	Markings and instructions	(See Annex F)	P
4.4.3	Safeguard robustness	See below.	P
4.4.3.1	General	See below.	P
4.4.3.2	Steady force tests	(See Clause T.3 T.4 T.5)	P
4.4.3.3	Drop tests	(See Clause T.7)	P
4.4.3.4	Impact tests		N/A
4.4.3.5	Internal accessible safeguard tests		N/A
4.4.3.6	Glass impact tests		N/A
4.4.3.7	Glass fixation tests		N/A
	Glass impact test (1J)		N/A
	Push/pull test (10 N)		N/A
4.4.3.8	Thermoplastic material tests	(See Clause T.8)	P
4.4.3.9	Air comprising a safeguard		N/A
4.4.3.10	Accessibility, glass, safeguard effectiveness		N/A
4.4.4	Displacement of a safeguard by an insulating liquid		N/A
4.4.5	Safety interlocks	(See Annex K)	N/A
4.5	**Explosion**		P
4.5.1	General	(See Annex M for batteries)	P

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Clause	Requirement + Test	Result - Remark	Verdict
4.5.2	No explosion during normal/abnormal operating condition	(See Clause B.2, B.3)	P
	No harm by explosion during single fault conditions	(See Clause B.4)	P
4.6	**Fixing of conductors**		P
	Fix conductors not to defeat a safeguard		N/A
	Compliance is checked by test..... :	See appended table 5.4.2 and 5.4.3.	P
4.7	**Equipment for direct insertion into mains socket–outlets**		N/A
4.7.2	Mains plug part complies with relevant standard... :	Not such product.	N/A
4.7.3	Torque (Nm)..... :		N/A
4.8	**Equipment containing coin/button cell batteries**		N/A
4.8.1	General	No coin/button cell batteries used.	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**		P
4.10	**Component requirements**		N/A
4.10.1	Disconnect Device		N/A
4.10.2	Switches and relays	No such switches and relays	N/A
5	**ELECTRICALLY-CAUSED INJURY**		P
5.2	**Classification and limits of electrical energy sources**		P
5.2.2	ES1, ES2 and ES3 limits	Supplied by max. 20.0VDC and max. DC output 12.0VDC and AC output 230Vac, whole circuit considered as ES1 and 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 Capacitance	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.2.2.4	Single pulse limits.....:	No such single pulses generated in the EUT or applied to it.	N/A
5.2.2.5	Limits for repetitive pulses.....:	No such repetitive pulses within the EUT	N/A
5.2.2.6	Ringing signals	No such ringing signals within the EUT	N/A
5.2.2.7	Audio signals	No such audio signals	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 5.6 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	Separated from ES3 mains by a reinforced safeguard.	P
5.3.1 b)	Skilled persons not unintentional contact ES3 bare conductors	Only ES1 circuit can be accessed for this product.	P
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	No opening of enclosure, no access with test probe to any ES3 circuit or parts.	P
	Test with test probe from Annex V		-
5.3.2.2 a)	Air gap – electric strength test potential (V)..... :		N/A
5.3.2.2 b)	Air gap – distance (mm) ..... :		N/A
5.3.2.3	Compliance		N/A
5.3.2.4	Terminals for connecting stripped wire		N/A
5.4	**Insulation materials and requirements**		P
5.4.1.2	Properties of insulating material	The choice and application have been taken into account as specified in this Clause 5 and Annex T. Natural rubber, hygroscopic materials or asbestos are not used as insulation.	P
5.4.1.3	Material is non-hygroscopic		N/A
5.4.1.4	Maximum operating temperature for insulating materials..... :	(See appended table)	P
5.4.1.5	Pollution degrees.....:	Pollution degree 2	P
5.4.1.5.2	Test for pollution degree 1 environment and for an insulating compound	Pollution degree 2 is applied. No insulating compound applied (however see 5.5.4).	P

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Clause	Requirement + Test	Result - Remark	Verdict
5.4.1.5.3	Thermal cycling test		N/A
5.4.1.6	Insulation in transformers with varying dimensions	No such transformer within the EUT	N/A
5.4.1.7	Insulation in circuits generating starting pulses	No such starting pulses within the EUT	N/A
5.4.1.8	Determination of working voltage.....:	(See appended table 5.4.1.8)	P
5.4.1.9	Insulating surfaces	Considered for accessible surface of enclosure.	P
5.4.1.10	Thermoplastic parts on which conductive metallic parts are directly mounted	See only 5.4.10.3 below	P
5.4.1.10.2	Vicat test.....:		N/A
5.4.1.10.3	Ball pressure test.....:	(See appended table 5.4.1.10.3)	P
5.4.2	Clearances		P
5.4.2.1	General requirements		N/A
	Clearances in circuits connected to AC Mains, Alternative method		N/A
5.4.2.2	Procedure 1 for determining clearance		N/A
	Temporary overvoltage .....:		—
5.4.2.3	Procedure 2 for determining clearance	(See appended table 5.4.2 and 5.4.3)	P
5.4.2.3.2.2	a.c. mains transient voltage..... :	2500V for Overvoltage Cat. II	—
5.4.2.3.2.3	d.c. mains transient voltage ..... :	No such transient	—
5.4.2.3.2.4	External circuit transient voltage.....:	No such transient	—
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 .....:	Using procedure 2 to determine the clearance according to 5.4.2.3.	N/A
5.4.2.5	Multiplication factors for clearances and test voltages .....:		N/A
5.4.2.6	Clearance measurement.....:	(See appended table 5.4.2 and 5.4.3)	P
5.4.3	Creepage distances	(See appended table 5.4.2 and 5.4.3)	P
5.4.3.1	General		P
5.4.3.3	Material group.....:	IIIa & IIIb	—
5.4.3.4	Creepage distances measurement.....:		P
5.4.4	Solid insulation	See below	P
5.4.4.1	General requirements		P
5.4.4.2	Minimum distance through insulation ..... :	(See appended table 5.4.2 and 5.4.3)	P

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Clause	Requirement + Test	Result - Remark	Verdict
5.4.4.3	Insulating compound forming solid insulation	See only 5.4.4.4 regarding to optocoupler.	P
5.4.4.4	Solid insulation in semiconductor devices	Approved optocoupler used. Requirements of G.12 met, see table 4.1.2 for listed component used.	P
5.4.4.5	Insulating compound forming cemented joints	No such construction within the EUT	N/A
5.4.4.6	Thin sheet material	See below	P
5.4.4.6.1	General requirements	Two layers of insulation tape in and around inverter T1 are used for reinforced insulation and are not expected to be subject to handling or abrasion during ordinary or instructed person servicing.	P
5.4.4.6.2	Separable thin sheet material	Where two layers are provided as reinforced insulation any one layer passed the electric strength test for reinforced insulation	P
	Number of layers (pcs) ..... :	2 Layers	P
5.4.4.6.3	Non-separable thin sheet material	No such thin sheet material within the EUT	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 G.5.3 and G.6.1	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.....:	See appended table 5.4.4.9	P
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 (MΩ)..... :		N/A
	Electric strength test.....:		N/A
5.4.6	Insulation of internal wire as part of supplementary safeguard		N/A
5.4.7	Tests for semiconductor components and for cemented joints		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.4.8	Humidity conditioning	Humidity treatment performed for 48hrs for equipment with every transformer and insulation tape source, after humidity test, Hi-pot test has been performed.	P
	Relative humidity (%), temperature (°C), duration (h)..... :	93%, 25°C, 48h	—
5.4.9	Electric strength test	(See appended table 5.4.9) tested for every inverter and insulation tape source	P
5.4.9.1	Test procedure for type test of solid insulation..... :	Compliance was checked immediately following temperature test in 5.4.1.4 on the complete unit and on a sample of the inverter raised to the relevant temperature as measured during that test. (See appended table 5.4.9)	P
5.4.9.2	Test procedure for routine test	No routine tests considered. To be considered during the relevant national approval.	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		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 U_{sp} ..... :		—
	Max increase due to ageing U_{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

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Clause	Requirement + Test	Result - Remark	Verdict
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	See the following details.	P
5.5.2	Capacitors and RC units		N/A
5.5.2.1	General requirement		N/A
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
5.5.4	Optocouplers	(See Annex G.12)	P
5.5.5	Relays		N/A
5.5.6	Resistors		N/A
5.5.7	SPDs		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	**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

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Clause	Requirement + Test	Result - Remark	Verdict
	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
	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**		N/A
5.7.2	Measuring devices and networks		N/A
5.7.2.1	Measurement of touch current	Only ES1, see also clause 5.2	N/A
5.7.2.2	Measurement of voltage		N/A
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..... :	No such product	N/A
	Air gap (mm)..... :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
6	**ELECTRICALLY- CAUSED FIRE**		P
6.2	**Classification of PS and PIS**		P
6.2.2	Power source circuit classifications.....:	(See appended table 6.2.2)	P
6.2.3	Classification of potential ignition sources	See the following details.	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
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 and no such temperature attained within the equipment. (See appended table 5.4.1.4, 9.3, B.1.5, B.2.6)	P
	Combustible materials outside fire enclosure.....:		N/A
6.4	**Safeguards against fire under single fault conditions**		P
6.4.1	Safeguard method	Method by control of fire spread applied. Fire enclosure provided.	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	See above.	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	PS3 and PS2 circuits inside.	N/A
6.4.5	Control of fire spread in PS2 circuits	Compliance detailed as follows: - Printed board: rated min. V-0 - Plastic enclosure: rated V-0 - Internal wire: rated VW-1 - Internal cells: complying with IEC/EN 62133. - All other components: at least V-2 except for parts mounted on min. V-1 material or small parts of combustible material (with mass less than 4g).	P
6.4.5.2	Supplementary safeguards		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
6.4.6	Control of fire spread in PS3 circuits	Compliance detailed as follows: - Printed board: rated min. V-0 - All other components: at least V-2 except for parts mounted on min. V-1 material or small parts of combustible material (with mass less than 4g). −Isolating transformer: complying with G.5.3.	P
6.4.7	Separation of combustible materials from a PIS	Fire enclosure provided for all internal parts.	P
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	The V-0 fire enclosure is used for the whole enclosure.	P
6.4.8.2.1	Requirements for a fire barrier	No fire barrier used.	N/A
6.4.8.2.2	Requirements for a fire enclosure	For available power <4000W, the V-0 fire enclosure is used for the overall enclosure as above.	P
6.4.8.3	Constructional requirements for a fire enclosure and a fire barrier		P
6.4.8.3.1	Fire enclosure and fire barrier openings		P
6.4.8.3.2	Fire barrier dimensions		P
6.4.8.3.3	Top openings and properties		P
	Openings dimensions (mm).....:		P
6.4.8.3.4	Bottom openings and properties		N/A
	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		P
	Openings dimensions (mm).....:		P
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.....:	Fire enclosure is made of V-0 material.	P
6.4.9	Flammability of insulating liquid.....:	Not such product.	N/A
6.5	**Internal and external wiring**		P

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Clause	Requirement + Test	Result - Remark	Verdict
6.5.1	General requirements	The internal wires are complied with UL 758 standard, which test method and testing condition equal to IEC/EN 60695-11-21;	P
6.5.2	Requirements for interconnection to building wiring .....:		N/A
6.5.3	Internal wiring size (mm^2) for socket-outlets..... :	(See appended tables 4.1.2)	P
6.6	**Safeguards against fire due to the connection to additional equipment**		P
7	**INJURY CAUSED BY HAZARDOUS SUBSTANCES**		P
7.2	**Reduction of exposure to hazardous substances**		P
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**		P
8	**MECHANICALLY-CAUSED INJURY**		P
8.2	**Mechanical energy source classifications**		P
8.3	**Safeguards against mechanical energy sources**		N/A
8.4	**Safeguards against parts with sharp edges and corners**		P
8.4.1	Safeguards	Edges and corners of the enclosure are rounded.	N/A
	Instructional Safeguard.....:		N/A
8.4.2	Sharp edges or corners	No sharp edges or corners.	N/A
8.5	**Safeguards against moving parts**		N/A
8.5.1	Fingers, jewellery, clothing, hair, etc., contact with MS2 or MS3 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

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Clause	Requirement + Test	Result - Remark	Verdict
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		N/A
	Explosion test.....:		N/A
8.5.5.3	Glass particles dimensions (mm)..... :		N/A
8.6	**Stability of equipment**		P
8.6.1	General	Classification MS1 according to table 35, line 5 and no stability requirements.	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.....:	Not such product.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
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	Not such product.	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	Not such product.	N/A
8.10	**Carts, stands and similar carriers**		N/A
8.10.1	General	Not such product.	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
8.11	**Mounting means for slide-rail mounted equipment (SRME)**		N/A
8.11.1	General	Not such product.	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

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Clause	Requirement + Test	Result - Remark	Verdict
9.3.1	Touch temperatures of accessible parts..... :	Temperature of plastic enclosure classed as TS1 (see table 5.4.1.4, 9.3, B.1.5, B.2.6).	P
9.3.2	Test method and compliance	(see table 5.4.1.4, 9.3, B.1.5, B.2.6).	P
9.4	**Safeguards against thermal energy sources**		P
9.5	**Requirements for safeguards**		P
9.5.1	Equipment safeguard	Enclosure provided to limit the transfer of thermal energy of internal parts under normal operating conditions and abnormal operating conditions.	P
9.5.2	Instructional safeguard..... :	Instructional safeguard is not required.	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		P
	Lasers.....:		—
	Lamps and lamp systems.....:	RS1: The LED only used for indicating, which is considered as Low power application of LEDs are in the exempt group according to IEC 62471.	—
	Image projectors..... :		—
	X-Ray.....:		—
	Personal music player.....:		—
10.3	**Safeguards against laser radiation**		N/A
	The standard(s) equipment containing laser(s) comply.....:	No laser.	N/A
10.4	**Safeguards against optical radiation from lamps and lamp systems (including LED types)**		P
10.4.1	General requirements	No such radiation generated from the equipment. Only LED classed as RS1 used.	P
	Instructional safeguard provided for accessible radiation level needs to exceed		N/A
	Risk group marking and location..... :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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	No such x-radiation generated from the equipment	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	Not such equipment.	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
	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	(See appended table B.1.5)	P

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Clause	Requirement + Test	Result - Remark	Verdict
B.2	**Normal operating conditions**		P
B.2.1	General requirements..... :	(See summary of testing and appended table)	P
	Audio Amplifiers and equipment with audio amplifiers.....:	Not such equipment.	N/A
B.2.3	Supply voltage and tolerances	DC 20V	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, B.4)	P
B.3.2	Covering of ventilation openings	No such openings.	N/A
	Instructional safeguard..... :		N/A
B.3.3	DC mains polarity test	The EUT is not connected to a DC. mains	N/A
B.3.4	Setting of voltage selector	No voltage selector used within the EUT	N/A
B.3.5	Maximum load at output terminals	(See appended table B.3, B.4)	P
B.3.6	Reverse battery polarity	No such battery	N/A
B.3.7	Audio amplifier abnormal operating conditions	Not such equipment.	N/A
B.3.8	Safeguards functional during and after abnormal operating conditions..... :	All safeguards remained effective.	P
B.4	**Simulated single fault conditions**		P
B.4.1	General	See below.	P
B.4.2	Temperature controlling device	No such device used.	N/A
B.4.3	Blocked motor test	DC Fan Blocked.	P
B.4.4	Functional insulation	See the following details.	P
B.4.4.1	Short circuit of clearances for functional insulation	(See appended table B.3, B.4)	P
B.4.4.2	Short circuit of creepage distances for functional insulation	(See appended table B.3, B.4)	P
B.4.4.3	Short circuit of functional insulation on coated printed boards	No coated printed boards used.	N/A
B.4.5	Short-circuit and interruption of electrodes in tubes and semiconductors	(See appended table B.3, B.4 for faults on electronic components)	P
B.4.6	Short circuit or disconnection of passive components	(See appended table B.3, B.4)	P
B.4.7	Continuous operation of components	The EUT is continuous operating type and no such components intended for short time operation or intermittent operation	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
B.4.8	Compliance during and after single fault conditions .....:	No change to circuits classified in 5.3.	P
B.4.9	Battery charging and discharging under single fault conditions	(See appended tables B.3, B.4 & Annex M)	P

C	**UV RADIATION**		N/A
C.1	**Protection of materials in equipment from UV radiation**		N/A
C.1.2	Requirements	No such UV generated from the equipment.	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).....:		—
	Rated load impedance (Ω) .....:		—
	Open-circuit output voltage (V).....:		—
	Instructional safeguard.....:		—
E.2	**Audio amplifier normal operating conditions**		N/A
	Audio signal source type.....:		—
	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

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Clause	Requirement + Test	Result - Remark	Verdict
F	**EQUIPMENT MARKINGS, INSTRUCTIONS, AND INSTRUCTIONAL SAFEGUARDS**		P
F.1	**General**		P
	Language ..... :	English	—
F.2	**Letter symbols and graphical symbols**		P
F.2.1	Letter symbols according to IEC60027-1	Letter symbols for quantities and units are complied with IEC 60027-1.	P
F.2.2	Graphic symbols according to IEC, ISO or manufacturer specific	Graphical symbols are complied with IEC 60417, ISO 3864-2, ISO 7000 or ISO 7010.	P
F.3	**Equipment markings**		P
F.3.1	Equipment marking locations	Equipment marking is located on the enclosure surface and is easily visible.	P
F.3.2	Equipment identification markings	See the following details.	P
F.3.2.1	Manufacturer identification ..... :	Shenzhen Dawei Innovation Co., Ltd.	P
F.3.2.2	Model identification ..... :	DW501	P
F.3.3	Equipment rating markings	See copy of marking plate.	P
F.3.3.1	Equipment with direct connection to mains		N/A
F.3.3.2	Equipment without direct connection to mains		P
F.3.3.3	Nature of the supply voltage..... :	⎓	P
F.3.3.4	Rated voltage..... :	See copy of marking plate.	P
F.3.3.5	Rated frequency..... :	Class II equipment. Output frequency: 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		N/A
F.3.4	Voltage setting device	No voltage setting device.	N/A
F.3.5	Terminals and operating devices		N/A
F.3.5.1	Mains appliance outlet and socket-outlet markings ..... :		N/A
F.3.5.2	Switch position identification marking..... :		N/A
F.3.5.3	Replacement fuse identification and rating markings ..... :		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

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Clause	Requirement + Test	Result - Remark	Verdict
F.3.6	Equipment markings related to equipment classification		N/A
F.3.6.1	Class I equipment	Class II 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..... :		P
F.3.6.3	Functional earthing terminal marking..... :		N/A
F.3.7	Equipment IP rating marking..... :		N/A
F.3.8	External power supply output marking.....:	230Vac 50Hz	P
F.3.9	Durability, legibility and permanence of marking		P
F.3.10	Test for permanence of markings	The label was subjected to the permanence of marking test. The label was rubbed with cloth soaked with water for 15 sec. And then again for 15 sec, with the cloth soaked with petroleum spirit. After this test there was no damage to the label. The marking on the label did not fade. There was no curling and lifting of the label edge. After each test, the marking remained legible.	P
F.4	**Instructions**		P
	a) Information prior to installation and initial use		N/A
	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
	g) Protective earthing used as a safeguard		N/A
	h) Protective conductor current exceeding ES2 limits		N/A
	i) Graphic symbols used on equipment	 Class II equipment	P
	j) Permanently connected equipment not provided with all-pole mains switch	Not permanently connected equipment.	N/A
	k) Replaceable components or modules providing safeguard function		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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 switch used.	N/A
G.1.2	Ratings, endurance, spacing, maximum load		N/A
G.1.3	Test method and compliance		N/A
G.2	**Relays**		N/A
G.2.1	Requirements	No relay used.	N/A
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**		N/A
G.3.1	Thermal cut-offs		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
G.3.4	Overcurrent protection devices		N/A
G.3.5	Safeguards components not mentioned in G.3.1 to G.3.4		N/A
G.3.5.1	Non-resettable devices suitably rated and marking provided		N/A
G.3.5.2	Single faults conditions.....:		N/A
G.4	**Connectors**		P
G.4.1	Spacings		P
G.4.2	Mains connector configuration.....:	(See appended table 4.1.2)	P
G.4.3	Plug is shaped that insertion into mains socket-outlets or appliance coupler is unlikely		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
G.5	**Wound components**		P
G.5.1	Wire insulation in wound components	Approved TIW used for secondary winding of Inverter T1	P
G.5.1.2	Protection against mechanical stress	Two wires in contact inside wound component, angle between 45° and 90° .	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..... :	The Inverter meet the requirements given in G.5.3.2 and G.5.3.3.	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 secondary part as it is not isolated from Secondary)	P
	Protection from displacement of windings..... :	The end-turn of each winding is fixed by insulation tape	—
G.5.3.3	Transformer overload tests	(See appended table B.3, B.4)	P
G.5.3.3.1	Test conditions	Tested in the complete equipment as an SMPS.	P
G.5.3.3.2	Winding temperatures	(See appended table B.3, B.4)	P
G.5.3.3.3	Winding temperatures - alternative test method	Alternative test method was not considered.	P
G.5.3.4	Transformers using FIW		P
G.5.3.4.1	General		P
	FIW wire nominal diameter..... :	See appended table 4.1.2	—
G.5.3.4.2	Transformers with basic insulation only		N/A
G.5.3.4.3	Transformers with double insulation or reinforced insulation..... :	Primary windings and secondary windings are separated by Reinforced insulation	P

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Clause	Requirement + Test	Result - Remark	Verdict
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	DC Fan used	P
G.5.4.1	General requirements	See clause 5.4.6, 5.4.9	P
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		P
G.5.4.6.2	Tested in the unit		P
	Maximum Temperature ..... :	Windy of Motor:69.4°C Plastic enclosure near DC Fan: 54.6°C Ambient: 25.0°C	P
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		P
G.6.2	Enamelled winding wire insulation		P
G.7	**Mains supply cords**		N/A
G.7.1	General requirements	No such cord provided	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

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Clause	Requirement + Test	Result - Remark	Verdict
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, *D* (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**		N/A
G.8.1	General requirements	No varistors used	N/A
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 IC current limiter provided within the equipment.	N/A
	IC limiter output current (max. 5A)..... :		—
	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	Resistor bridging functional insulation	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**		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
G.11.1	General requirements		N/A
G.11.2	Conditioning of capacitors and RC units		N/A
G.11.3	Rules for selecting capacitors		N/A
G.12	**Optocouplers**		P
	Optocouplers comply with IEC 60747-5-5 with specifics	The optocoupler (U15, U16) used in the equipment and complied with IEC/EN 60747-5-5. See Appended table 4.1.2.	P
	Type test voltage $V_{ini,a}$ ..... :		—
	Routine test voltage, $V_{ini,b}$ ..... :		—
G.13	**Printed boards**		N/A
G.13.1	General requirements	Only need to comply with functional insulation, see only B.4.4.	N/A
G.13.2	Uncoated printed boards		N/A
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 ..... :		N/A
G.15	**Pressurized liquid filled components**		N/A
G.15.1	Requirements		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		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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		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
H.3.2.3	Monitoring voltage (V).....:		N/A
J	**INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION**		N/A
J.1	**General**		N/A
	Winding wire insulation.....:		—
	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		—
K	**SAFETY INTERLOCKS**		N/A
K.1	**General requirements**		N/A
	Instructional safeguard.....:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
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
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**		P
M.1	**General requirements**		P
M.2	**Safety of batteries and their cells**		P
M.2.1	Batteries and their cells comply with relevant IEC standards.....:	The cell complies with IEC 62133:2012. (See appended table 4.1.2)	P

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Clause	Requirement + Test	Result - Remark	Verdict
M.3	**Protection circuits for batteries provided within the equipment**		P
M.3.1	Requirements		P
M.3.2	Test method		P
	Overcharging of a rechargeable battery		P
	Excessive discharging		P
	Unintentional charging of a non-rechargeable battery		N/A
	Reverse charging of a rechargeable battery		N/A
M.3.3	Compliance	(See appended table M.3)	P
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.....:	The V-0 fire enclosure is used.	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
M.4.4.6	Compliance		N/A
M.5	**Risk of burn due to short-circuit during carrying**		P
M.5.1	Requirement	Product sealed, no such hazard	P
M.5.2	Test method and compliance		N/A
M.6	**Safeguards against short-circuits**		P
M.6.1	External and internal faults	The cells complied with IEC 62133:2012 which considered the forced internal short circuit test. No such explosion or fire likely to result from short circuits.	P
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

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Clause	Requirement + Test	Result - Remark	Verdict
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	Mentioned in cell specifications	P
	Instructional safeguard..... :		P

N	**ELECTROCHEMICAL POTENTIALS**		N/A
	Material(s) used..... :		—

O	**MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES**		N/A
	Value of X (mm)..... :		—

P	**SAFEGUARDS AGAINST CONDUCTIVE OBJECTS**		P
P.1	**General**	No openings of enclosure.	P
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

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Clause	Requirement + Test	Result - Remark	Verdict
	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**		P
Q.1	**Limited power sources**		P
Q.1.1	Requirements		P
	a) Inherently limited output		N/A
	b) Impedance limited output		N/A
	c) Regulating network limited output		P
	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)	P
	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**	No such consideration.	N/A
R.2	**Test setup**		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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..... :	Approved fire enclosure used.	—
	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
	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 ..... :**		N/A
T.3	**Steady force test, 30 N ..... :**		N/A
T.4	**Steady force test, 100 N ..... :**	(See appended table T.4)	P

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Clause	Requirement + Test	Result - Remark	Verdict
T.5	**Steady force test, 250 N .....:**		N/A
T.6	**Enclosure impact test**		N/A
	Fall test		N/A
	Swing test		N/A
T.7	**Drop test ..... :**	(See appended table T.7)	P
T.8	**Stress relief test.....:**	(See appended table T.8)	P
T.9	**Glass Impact Test..... :**		N/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		P
V.1.2	Surfaces and openings tested with jointed test probes		N/A
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**		N/A
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

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Clause	Requirement + Test	Result - Remark	Verdict
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
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

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)]	
Max. 20VDC	The EUT is designed to be supplied by Max. 15VDC external supply	Normal:	Max. 20VDC	--	--	--	ES1
Max. 12.0VDC of internal battery	Max. 12.0VDC output (Power by internal battery)	Normal:	Max. 12.0VDC	--	--	--	ES1
		Abnormal:	--	--	--	--	--
		Single fault:	--	--	--	--	--
AC output 230Vac/50Hz	Inverter T1 Pin 10-12	Normal:	Max. 320Vpeak	--	--	60Hz	ES3
		Abnormal:	--	--	--	--	--
		Single fault:	--	--	--	--	--
Supplementary information:							

5.4.1.8	TABLE: Working voltage measurement			P
Location	RMS voltage (V)	Peak voltage (V)	Frequency (Hz)	Comments
Inverter T1 Pin 9-5	148	312	50000.2	--
Inverter T1 Pin 9-12	149	320	519	**Max. Vpeak**
Inverter T1 Pin 9-15	152	318	80.0	**Max. VRMS**
Inverter T1 Pin 10-5	123	290	330000.0	--
Inverter T1 Pin 10-12	136	304	500000.1	--
Inverter T1 Pin 10-15	150	320	320000.9	--
Inverter T1 Pin 11-5	149	298	500000.5	--
Inverter T1 Pin 11-12	135	298	500000.6	
Inverter T1 Pin 11-15	121	298	500000.2	--
U9 Pin 1-3	52	262	720	--
U9 Pin 2-3	50	238	587	--
U9 Pin 1-4	148	204	489	--
U9 Pin 2-4	79.6	206	441	--
U10 Pin 1-3	53	262	710	--
U10 Pin 2-3	51	239	585	--
U10 Pin 1-4	148	204	489	--
U10 Pin 2-4	79.4	205	442	--

Supplementary information: Inverter Output voltage: 230Vac/50Hz.

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

5.4.1.10.3	TABLE: Ball pressure test of thermoplastics			N/A
Allowed impression diameter (mm)..... :	≤ 2 mm			—
Object/Part No./Material	Manufacturer/trademark	Thickness (mm)	Test temperature (°C)	Impression diameter (mm)
--	--	--	--	--
Supplementary information: The bobbin materials of transformer T1 is phenolic. No need to be tested.				

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)
Live trace on inverter board to enclosure (side)	320	152	<30	3.0	8.3	2500	5.0	8.3
Heatsink for Q18 on inverter board to enclosure (top)	320	152	<30	3.0	12.1	2500	5.0	12.1
Heatsink for Q18 on inverter board to LED board	320	152	<30	3.0	98.0	2500	5.0	98.0
J2 trace on inverter board to DC board	320	152	<30	3.0	37.0	2500	5.0	37.0
Heatsink for Q18 on inverter board to C30	320	152	<30	3.0	26.0	2500	5.0	26.0
Live pins of AC receptacle to DC output board	320	152	<30	3.0	12.8	2500	5.0	12.8
inverter T1 primary winding to secondary pin(R)	320	152	<30	3.0	8.3	2500	5.0	8.3
inverter T1 core secondary winding to (R)	320	152	<30	3.0	8.3	2500	5.0	8.3

Input to output of Opto-coupler U15, U16	320	152	<30	3.0	7.5	2500	5.0	7.5
Supplementary information: B=Basic insulation, S=Supplementary insulation, R=Reinforced insulation. 1) Only for frequency below 30 kHz 2) Complete Electric Strength voltage (E.S. (V) when 5.4.2.4 applied)								

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)
Enclosure	320	R	0.4	3.0)
Bobbin in transformer (T1)	320	R	0.4	3.0)
Supplementary information: B=Basic insulation, S=Supplementary insulation, R=Reinforced insulation. 1). See appended table 4.1.2.				

5.4.4.9	**TABLE: Solid insulation at frequencies >30 kHz**					P
Insulation material	E_P	Frequency (kHz)	K_R	Thickness d (mm)	Insulation	V_{PW} (Vpk)
Bobbin of transformer T1	17	50.6	0.71	2.0	R	320
Insulation tape used for transformer T1	52	50.6	0.59	0.1	R	320
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
Secondary high voltage and DC output for unit (with metal foil)	DC	2500	No
Secondary high voltage and enclosure(plastic) for unit (with metal foil)	DC	4000	No
T1: Secondary high voltage and secondary SELV	DC	4000	No
T1: Secondary high voltage and Core	DC	4000	No
One layer insulation tape wrapped around T1	DC	4000	No
Secondary high voltage and DC output for unit (with metal foil)	DC	4000	No
Supplementary information: Core of transformer is considered as primary circuit part.			

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

				(Vpk)	
--	--	--	--	--	--
Supplementary information: X-capacitors installed for testing: 0.22μF ☒ bleeding resistor rating: RX1=RX2=1.5MΩ ☐ ICX:					

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**					N/A
Location	Operating and fault conditions	Supply Voltage (V)	Parameters			ES class
			Voltage (V_{rms} or V_{pk})	Current (A_{rms} or A_{pk})	Freq. (Hz)	
--	--	--	--	--	--	--
Supplementary information: Abbreviation: SC= short circuit; OC= open circuit						

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
--	--	--	--	--	--	--
Supplementary information: Abbreviation: SC= short circuit, OC= open circuit						

6.2.2	**TABLE: Power source circuit classifications**					P
Location	Operating and fault condition	Voltage (V)	Current (A)	Max. Power[1)] (W)	Time (S)	PS class

Cell + to – (4S15P)	Normal condition	2.53	>100A	>100W	5	PS3
USB-C PD60W Output1 terminal*	Normal condition	5.17	3.65	16.96	5	PS2
USB-C PD60W Output1 terminal*	Normal condition	9.21	3.65	29.66	5	PS2
USB-C PD60W Output1 terminal*	Normal condition	12.26	3.65	40.26	5	PS2
USB-C PD60W Output1 terminal*	Normal condition	15.28	3.66	50.76	5	PS2
USB-C PD60W Output1 terminal*	Normal condition	19.89	3.66	66.56	5	PS2
USB-C PD60W Output1 terminal*	Q7 Pin 2-6 SC	5.17	3.65	16.96	5	PS2
USB-C PD60W Output1 terminal*	Q5 Pin 3-7 SC	5.17	3.65	16.96	5	PS2
USB-C PD18W Output1 terminal*	Normal condition	5.06	3.84	17.76	5	PS2
USB-C PD18W Output1 terminal*	Normal condition	9.10	2.46	20.46	5	PS2
USB-C PD18W Output1 terminal*	Normal condition	12.13	21.56	1.99	5	PS2
USB-C PD18W Output1 terminal*	Q17 Pin S-D SC	5.06	3.84	17.76	5	PS2
USB-C PD18W Output1 terminal*	U14 Pin 2-1 SC	5.06	3.84	17.76	5	PS2
USB1 QC3.0 Output terminal**	Normal condition	5.10	3.75	17.07	5	PS2
USB1 QC3.0 Output terminal**	Normal condition	9.11	3.78	31.76	5	PS2

USB1 QC3.0 Output terminal**	Normal condition	12.11	3.77	42.12	5	PS2
USB1 QC3.0 Output terminal**	U6 Pin 2-3 SC	5.10	3.75	17.07	5	PS2
USB2 QC3.0 Output terminal**	Normal condition	5.21	3.80	17.58	5	PS2
USB2 QC3.0 Output terminal**	Normal condition	9.22	3.86	31.86	5	PS2
USB2 QC3.0 Output terminal**	Normal condition	12.20	3.85	42.86	5	PS2
USB2 QC3.0 Output terminal**	U6 Pin 2-3 SC	5.10	3.75	17.07	5	PS2
DC*1 Output terminal**	Normal condition	12.30	150	17	5	PS3
Cig Port*1 Output terminal**	Normal condition	12.30	150	17	5	PS3
AC Output terminal*****	Normal condition	230	6.2	620	5	PS3

Supplementary information:
Abbreviation: SC= short circuit; OC= open circuit
1) Measured after 3 s for PS1 and measured after 5 s for PS2 and PS3.
2) * USB1 & USB2 (QC3.0) Output: 5V⎓/3A, 9V⎓/2A, 2V⎓/1.5A
3) ** USB-C PD 60W: 5V⎓/3A, 9V⎓/3A, 12V⎓/3A, 15V⎓/3A, 20V⎓/3A (In/Out);
4) *** USB-C PD 18W: 5V⎓/3A, 9V⎓/2A, 12V⎓/1.5A
5) **** DC*1+Cig*1. Output: 12V⎓/8A
6) *****AC Output terminal load 230V/500W

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
All primary circuits/components	--	--	--	Yes

Supplementary information:

All primary circuits such as components DB1, LR1, LR2 and T1 having soldered pins in mains circuit (>50V peak) and secondary parts connected directly to secondary winding where Vp × Irms greater than 15 are considered as arcing PIS.

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

6.2.3.2	TABLE: Determination of resistive PIS		P
Location	Operating and fault condition	Dissipate power (W)	Arcing PIS? Yes / No
--	--	--	--
Supplementary information: internal lithium battery pack with PS3			

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
--	--	--	--	--
Supplementary information:				

9.6	TABLE: Temperature measurements for wireless power transmitters								N/A
Supply voltage (V).....:	--								—
Max. transmit power of transmitter (W)..... :	--								—
	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		
Foreign objects	Object (ºC)	Ambient (ºC)	Object (ºC)	Ambient (ºC)	Object (ºC)	Ambient (ºC)	Object (ºC)	Ambient (ºC)	
--	--	--	--	--	--	--	--	--	
Supplementary information:									

5.4.1.4, 9.3, B.1.5, B.2.6	TABLE: Temperature measurements		P
Supply voltage (V).....	See below	See below	—
Ambient temperature during test T_{amb} (°C).....	40.0	40.0	—
Maximum measured temperature T of part/at:	T (°C)		Allowed T_{max} (°C)
	(3)	(4)	
L5 body	40.7	67.0	130
PCB near U14	40.7	72.2	130
PCB near U4	40.5	82.5	130

PCB near Q8	40.7	86.6	130
PCB near U4	40.7	68.1	130
PCB near U7	41.0	63.7	130
L3 body	42.1	59.9	130
PCB near U15	45.2	60.0	130
Plastic enclosure inside near L3	39.9	54.2	Ref.
Plastic enclosure outside near L3	39.8	52.6	77*
AC Output wire	40.8	43.8	80
AC plug holder	41.5	43.4	77*
PCB near Q39	46.1	43.5	130
PCB near D14	69.8	44.6	130
PCB near Q47	49.8	46.5	130
PCB near U12	62.3	51.1	130
PCB near U13	45.7	43.3	130
L3 body	45.8	43.1	130
C124 body	49.6	42.7	105
PCB near D13	67.8	43.3	130
L2 body	74.6	43.7	130
Plastic enclosure outside near T1 (Main PCB)	49.4	41.8	77*
C17 body	42.4	42.9	105
T1 winding	41.9	43.1	110
T1 core	42.2	43.3	110
PCB near T1	43.1	43.8	130
Plastic enclosure inside near T1	40.4	41.3	85
Plastic enclosure outside near T1	39.9	40.6	77*
C6 body	40.5	42.0	105
L1 body	40.2	42.3	130
optical coupler U9 body	41.2	43.3	100
PCB near FL3	39.9	41.7	130
LF1 body	39.6	41.9	130
C30 body	39.5	42.0	105
Battery wire	42.8	48.1	200
Battery body	54.9	53.1	Ref.
Plastic enclosure inside near battery	43.2	45.9	Ref.

Plastic enclosure outside near battery	42.0	45.0	77*
fan Plastic enclosure	42.0	41.4	77*
fan input wire	44.2	41.3	80
Display	41.1	46.8	77*
Knob	39.3	48.5	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:

Note 1: Manufacturer's specified (Tma): 40°C.

Note 2: (1): Charging mode, DC input terminal 18Vdc/4A charging with internal cells full discharged;;

(2): Charging mode, USB-C Output terminal 20Vdc/3.0A charging with internal cells full discharged;;

Note 3: *Temperature limit for TS1 of accessible enclosure outside according to Table 38. (External surfaces of plastic enclosure will be contacted Limits for >1s and <10s, so the temperature limit 77°C.

5.4.1.4, 9.3, B.1.5, B.2.6	**TABLE: Temperature measurements**	P

Supply voltage (V).....	See below	See below	—
Ambient temperature during test T_{amb} (°C).....	40.0	40.0	—
Maximum measured temperature T of part/at:	T (°C)		Allowed T_{max} (°C)
	(3)	(4)	
L5 body	85.7	43.7	130
PCB near U14	93.8	43.7	130
PCB near U4	102.7	43.7	130
PCB near Q8	111.9	43.9	130
PCB near U4	84.5	43.8	130
PCB near U7	87.0	43.9	130
L3 body	84.7	44.0	130
PCB near U15	82.3	43.1	130
Plastic enclosure inside near L3	65.3	42.7	Ref.
Plastic enclosure outside near L3	59.9	42.7	77*
AC Output wire	49.9	42.5	80
AC plug holder	51.2	43.2	77*
PCB near Q39	81.7	44.4	130
PCB near D14	67.7	47.8	130

PCB near Q47	74.0	48.1	130
PCB near U12	101.5	46.1	130
PCB near U13	79.5	48.7	130
L3 body	79.1	82.3	130
C124 body	65.3	102.3	105
PCB near D13	63.5	98.1	130
L2 body	66.5	74.5	130
Plastic enclosure outside near T1 (Main PCB)	55.7	58.1	77*
C17 body	47.6	57.7	105
T1 winding	46.4	106.5	110
T1 core	46.7	56.5	110
PCB near T1	48.9	63.4	130
Plastic enclosure inside near T1	42.4	72.3	85
Plastic enclosure outside near T1	41.5	49.4	77*
C6 body	44.3	44.8	105
L1 body	43.6	38.3	130
optical coupler U9 body	47.8	79.3	100
PCB near FL3	43.4	100.1	130
LF1 body	42.6	42.6	130
C30 body	42.1	40.3	105
Battery wire	59.6	44.9	200
Battery body	61.1	45.5	Ref.
Plastic enclosure inside near battery	54.2	45.4	Ref.
Plastic enclosure outside near battery	51.5	46.2	77*
fan Plastic enclosure	47.7	48.8	77*
fan input wire	46.1	44.3	80
Display	50.7	41.8	77*
Knob	52.2	47.7	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:

Note 1: Manufacturer's specified (Tma): 40°C.

Note 2: (3): Discharging mode, USB-A1 12V 1.5A + USB-A2 12V 1.5A + USB-C PD 60W 20V 3.0A + USB-C PD 18W 12V 1.5A + DC 12V 8A output terminal load with internal cells full charged and LED lamp normal

working;

(4): Discharging mode, AC 230V/500W output terminal load with internal cells full charged and LED lamp normal working;

Note 3: *Temperature limit for TS1 of accessible enclosure outside according to Table 38. (External surfaces of plastic enclosure will be contacted Limits for >1s and <10s, so the temperature limit 77°C.

B.2.5	**TABLE: Input test**							P
U (V)	Hz	I (A)	I rated (A)	P (W)	P rated (W)	Fuse No	I fuse (A)	Condition/status
Charging mode: DC input terminal charging mode (Charging with fully discharged battery)								
18VDC	--	2.7	4.6	42.5	--	--	--	1. Only charging; 2. Internal battery pack charge current: 3.05A 3. Internal battery pack charge voltage: 12.30V
20VDC	--	2.7	4.6	54.0	--	--	--	Can not be charged.
Discharging mode:								
USB1 (QC3.0) + USB2 (QC3.0) + USB-C PD 60W + USB-C PD 18W + DC output terminal discharging mode (Discharging with fully charged battery)								
16.52 V (4S15P)	--	16.11	--	15.71	--	--	--	Only USB1 (QC3.0) Output load 12V/1.5A and USB2 (QC3.0) Output load 12V/1.5A and USB-C PD 60W Output load 20V/3.0A and USB-C PD 18W Output load 12V/1.5A and DC Output load 12V 8A A
USB-C PD60W output terminal discharging mode (Discharging with fully charged battery)								
16.52 V (4S15P)	--	1.32	--	15.00	--	--	--	Only USB-C PD60W output load 5Vdc/3A
16.52 V (4S15P)	--	2.12	--	25.81	--	--	--	Only USB-C PD60W output load 9Vdc/3A
16.52 V (4S15P)	--	2.68	--	34.93	--	--	--	Only USB-C PD60W output load 12Vdc/3A
16.52 V (4S15P)	--	3.21	--	43.37	--	--	--	Only USB-C PD60W output load 15Vdc/3A
16.52 V (4S15P)	--	4.21	--	57.33	--	--	--	Only USB-C PD60W output load 20Vdc/3A
USB-C PD18W output terminal discharging mode (Discharging with fully charged battery)								
16.52 V (4S15P)	--	1.30	--	14.73	--	--	--	Only USB-C PD18W output load 5Vdc/3A
16.52 V (4S15P)	--	1.47	--	17.38	--	--	--	Only USB-C PD18W output load 9Vdc/2A

16.52 V (4S15P)	--	1.45	--	17.73	--	--	--	Only USB-C PD618W output load 12Vdc/1.5A
USB-1 QC3.0 output terminal discharging mode (Discharging with fully charged battery)								
16.52 V (4S15P)	--	1.47	--	14.63	--	--	--	Only USB-C PD18W output load 5Vdc/3A
16.52 V (4S15P)	--	1.55	--	17.71	--	--	--	Only USB-C PD18W output load 9Vdc/2A
16.52 V (4S15P)	--	1.54	--	17.80	--	--	--	Only USB-C PD618W output load 12Vdc/1.5A
USB-2 QC3.0 output terminal discharging mode (Discharging with fully charged battery)								
16.52 V (4S15P)	--	1.44	--	14.99	--	--	--	Only USB-C PD18W output load 5Vdc/3A
16.52 V (4S15P)	--	1.55	--	17.96	--	--	--	Only USB-C PD18W output load 9Vdc/2A
16.52 V (4S15P)	--	1.53	--	18.03	--	--	--	Only USB-C PD618W output load 12Vdc/1.5A
DC output terminal discharging mode (Discharging with fully charged battery)								
16.52 V (4S15P)	--	7.38	--	95.36	--	--	--	Only DC output load 12Vdc/8A
AC output terminal discharging mode (Discharging with fully charged battery)								
16.52V (4S15P)	--	61	--	500	--	--	--	Only AC output load 110Vac/500W
Supplementary information:								

B.3, B.4	**TABLE: Abnormal operating and fault condition tests**					P
Ambient temperature T_{amb} (°C)..... :		24.4°C, if not specified				—
Power source for EUT: Manufacturer, model/type, outputrating... :		--				—
Component No.	Condition	Supply voltage (V)	Test time	Fuse no.	Fuse current (A)	Observation
1) Charging mode (DC18V/4.6 A input terminal) (Charging with fully discharged battery pack)						
Q11 Pin 2-6	SC	18Vdc	10mins	--	--	Unit operated normally, input current: 2.70A → 0A; internal battery charge current: 3.05A →0A. internal battery voltage: 12.30V(4S15P), No hazard.
Q3 pin D-S	SC	18Vdc	10mins	--	--	Unit operated normally, input current: 2.70A → 2.70A; internal battery charge current: 3.05A →3.05A. internal battery voltage: 12.30V(4S15P), No hazard.

Q35 pin D-S	SC	18Vdc	10mins	--	--	Unit operated normally, input current: 2.70A → 2.70A; internal battery charge current: 3.05A →3.05A. internal battery voltage: 12.30V(4S15P), No hazard.
Q46 pin 3-2	SC	18Vdc	10mins	--	--	Unit operated normally, input current: 2.70A → 2.70A; internal battery charge current: 3.05A →3.05A. internal battery voltage: 12.30V(4S15P), No hazard.
2) Charging mode (USB-C PD 60W 20V/3 A input terminal) (Charging with fully discharged battery pack)						
L1	SC	20Vdc	10mins	--	--	Unit operated normally, input current: 2.70A → 0A; internal battery charge current: 3.89A →0A. internal battery voltage: 12.30V(4S15P), No hazard.
Q7 pin 2-6	SC	20Vdc	10mins	--	--	Unit operated normally, input current: 2.70A → 2.70A; internal battery charge current: 3.89A →3.89A. internal battery voltage: 12.30V(4S15P), No hazard.
Q5 pin 3-7	SC	20Vdc	10mins	--	--	Unit operated normally, input current: 2.70A → 2.70A; internal battery charge current: 3.89A →3.89A. internal battery voltage: 12.30V(4S15P), No hazard.
U5 pin 16-3	SC	20Vdc	10mins	--	--	Unit operated normally, input current: 2.70A → 0A; internal battery charge current: 3.05A →0A. internal battery voltage: 12.30V(4S15P), No hazard.
3) USB1+USB2 terminal discharging mode (1. Discharging with fully charged battery pack; 2. USB1+USB2 output load 5Vdc/3.1A, if not specified.)						
USB1+USB2 terminal	OL	16.52Vdc	3.2hrs	--	--	Unit operated normally, internal battery discharge current: 16.11A → 17.16A; internal battery voltage: 16.52(2S8P)V→12.30V; USB1+USB2 output terminal load: 12Vdc/1.5A → 12Vdc/2.6A. Other discharge ports are in normal operation PCB near U14: 82.6°C; PCB near U5: 90.9°C; PCB near Q8: 99.9°C; PCB near U4: 73.8°C; PCB near U7: 78.2°C; PCB near L3: 93.7°C; PCB near U15: 79.1°C; Cell body: 50.1°C;

						Plastic enclosure near L3: 50.7°C; Ambient: 24.9°C. No hazard.
L3	SC	16.52Vdc	10mins	--	--	Unit operated normally, internal battery discharge current: 16.11A → 0A; internal battery voltage: 16.52(2S8P)V; No hazard.
U6 Pin 2-3	SC	16.52Vdc	10mins	--	--	Unit operated normally, internal battery discharge current: 16.11A → 0A; internal battery voltage: 16.52 (2S8P)V; No hazard.8.23(2S8P)V; No hazard.
U6 Pin 2-5	SC	16.52Vdc	10mins	--	--	Unit operated normally, internal battery discharge current: 16.11A → 0A; internal battery voltage: 16.52 (2S8P)V; No hazard.
4) USB-C PD 60W terminal discharging mode (1. Discharging with fully charged battery; 2. USB-C PD 60W output load 5Vdc/3A, if not specified.)						
USB-C PD 60W terminal	OL	16.52Vdc	3.20hrs	--	--	Unit operated normally, internal battery discharge current: 16.11A → 16.53A; internal battery voltage: 16.52 (2S8P)V→12.30V; USB3 output terminal load: 20Vdc/3A → 9Vdc/3.5A. Other discharge ports are in normal operation PCB near U14: 89.1°C; PCB near U5: 98.0°C; PCB near Q8: 107.2°C; PCB near U4: 79.8°C; PCB near U7: 82.3°C; PCB near L3: 80.0°C; PCB near U15: 77.6°C; Cell body: 50.1°C; Plastic enclosure near L3: 55.2°C; Ambient: 26.6°C. No hazard.
Q7 pin 2-6	SC	16.52Vdc	10mins	--	--	Unit operated normally, internal battery discharge current: 16.11A → 16.11A; internal battery voltage: 16.52 (4S15P)V; No hazard.
Q5 pin 3-7	SC	16.52Vdc	10mins	--	--	Unit operated normally, internal battery discharge current: 16.11A → 16.11A; internal battery voltage: 16.52 (4S15P)V; No hazard.
U5 pin 16-3	SC	16.52Vdc	10mins	--	--	Unit operated normally, internal battery discharge current: 16.11A → 0A; internal battery voltage:

						16.52 (4S15P)V; No hazard.
Q3 Pin 2-6	SC	16.52Vdc	10mins	--	--	Unit operated normally, internal battery discharge current: 16.11A → 16.11A; internal battery voltage: 16.52 (4S15P)V; No hazard.
5) USB-C PD 18W terminal discharging mode (1. Discharging with fully charged battery; 2. USB-C PD 18W output load 12Vdc/1.5A, if not specified.)						
L5	SC	16.52Vdc	10mins	--	--	Unit operated normally, internal battery discharge current: 16.11 A → 0A; internal battery voltage: 16.52 (4S15P)V, No hazard.
Q17 Pin S-D	SC	16.52Vdc	10mins	--	--	Unit operated normally, internal battery discharge current: 16.11A → 16.11A; internal battery voltage: 16.52 (4S15P)V, No hazard.
U14 Pin 2-1	SC	16.52Vdc	10mins	--	--	Unit operated normally, internal battery discharge current: 16.11A → 16.11A; internal battery voltage: 16.52 (4S15P)V, No hazard.
U14 Pin 2-3	SC	16.52Vdc	10mins	--	--	Unit operated normally, internal battery discharge current: 16.11A → 0A; internal battery voltage: 16.52 (4S15P)V, No hazard.
Q14 Pin 2-6	SC	16.52Vdc	10mins	--	--	Unit operated normally, internal battery discharge current: 16.11A → 16.11A; internal battery voltage: 16.52 (4S15P)V, No hazard.
6) DC output terminal discharging mode (1. Discharging with fully charged battery; 2. DC output load 12V/8A, if not specified.)						
U3 Pin 1-5	SC	16.52Vdc	10mins	--	--	Unit operated normally, internal battery discharge current: 16.11A → 16.11A; internal battery voltage: 16.52 (4S15P)V, No hazard.
U13 Pin 13-1	SC	16.52Vdc	10mins	--	--	Unit operated normally, internal battery discharge current: 16.11A → 16.11A; internal battery voltage: 16.52 (4S15P)V, No hazard.
U13 Pin 1--1	SC	16.52Vdc	10mins	--	--	Unit operated normally, internal battery discharge current: 16.11A → 16.11A; internal battery voltage: 16.52 (4S15P)V, No hazard.
AC output terminal discharging mode (1. Discharging with fully charged battery; 2. AC output load 110V/500W, if not specified.)						
D2	SC	16.52Vdc	10mins	--	--	Unit operated normally,

						internal battery discharge current: 61.0A → 0A; internal battery voltage: 16.52(4S15P)V; Samples damage
D4	SC	16.52Vdc	10mins	--	--	Unit operated normally, internal battery discharge current: 61.0A → 0A; internal battery voltage: 16.52(4S15P)V; Samples damage
C6	SC	16.52Vdc	10mins	--	--	Unit operated normally, internal battery discharge current: 61.0A → 0A; internal battery voltage: 16.52(4S15P)V; Samples damage
DC Fan Blocked	Blocked	16.52Vdc	2.5hrs	--	--	Unit operated normally, AC output load 110V/500W, LED lighting working, internal battery discharge current: 61.0A → 61.0A; internal battery voltage: 16.52(4S15P V; Motor Wire:56.5°C Plastic enclosure near DC Fan: 36.2°C Ambient: 25.0°C
AC socket output	OL	16.52Vdc	1.20hrs	--	--	Unit operated normally, AC output terminal load: 110V, 60Hz 550W, Led lighting working. Other discharge ports no load. PCB near Inverter T1: 67.1°C; Winding of Inverter T1: 111.9°C; Bobbin of Inverter T1: 72.2°C; body: 1112.4°C; PCB near U3: 102.5°C; L1 body: 74.3°C; PCB near U15: 71.0°C; Cell body: 53.1°C; Plastic enclosure near DC fan:46.0°C; Ambient: 24.7°C. No hazard.
Inverter T1 Pin 7 -Pin9	SC	16.52Vdc	10mins	--	--	Unit shut down immediately, internal battery discharge current: 61.0A → 0A; internal battery voltage: 16.52(4S15P) V;
Inverter T1 Pin 11 -Pin12	SC	16.52Vdc	10mins	--	--	Unit shut down immediately, internal battery discharge current: 61.0A → 0A; internal battery voltage: 16.52(4S15P) V;

Supplementary information:

1) SC: Short-circuited; OL: Overloaded.
2) Temperature limit for TS1 of accessible enclosure outside according to Table 38. (External surfaces of plastic enclosure will be contacted Limits for >1s and <10s, it may be used for local hotspots where touching can be easily avoided by changing the way the device is held), the temperature limit 77+24.0-25=76°C.

M.3	TABLE: Protection circuits for batteries provided within the equipment	P
Is it possible to install the battery in a reverse polarity position?.....:	No	—

Equipment Specification	Charging	
	Voltage (V)	Current (A)
	20	3.0

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)		
Guangxi Zhuoneng New Energy Technology Co., Ltd.	--	--	16.52V (4S15P =3*4.25V)	18.75A (S15P =15*1.25A)	120A (S15P =15*7.5A)	--

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

Specified battery temperature (°C).....:	0 °C -45 °C	—

Component No.	Fault condition	Charge/ discharge mode	Test time	Temp. (°C)	Current (A)	Voltage (V)	Observation
Input terminal*	Normal work	Charging mode	14hrs	38.1 (Under 24.3°C ambient)	3.89	12.30	NL, NS, NE, NF
Input terminal*	Q7 (pin2-6)	Charging mode	14hrs	38.1 (Under 24.3°C ambient)	3.89	12.30	NL, NS, NE, NF
USB-A1+ USB-A2 + USB-C PD + USB-C PD + DC terminal**	OL	Overload Discharge mode	6hrs	47.7(under 26.6°C ambient)	16.52	12.30	NL, NS, NE, NF

Supplementary information:

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

The data of abnormal charge and discharge current refer to table B.3 & B.4.

*Input terminal 20VDC, 3A charging;

** USB-A1+ USB-A2 + USB-C PD + USB-C PD + DC Output terminal load 12V/1.5A + 12V/1.5A + 20V/3.0A + 12V/1.5A + 12V/8A discharging;

M.4.2	TABLE: Charging safeguards for equipment containing a secondary lithium	N/A

	battery	
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

Note:1) All tests of this clause were repeated three times.

Q.1	**TABLE: Circuits intended for interconnection with building wiring (LPS)**						P
Output Circuit	Condition	U_{oc} (V)	Time (s)	I_{sc} (A)		S (VA)	
				Meas.	Limit	Meas.	Limit
USB-C PD60W Output terminal*	Normal condition	5.17	5s	3.65	8	16.96	100
USB-C PD60W Output terminal*	Normal condition	9.20	5s	3.66	8	29.66	100
USB-C PD60W Output terminal*	Normal condition	12.26	5s	3.65	8	40.26	100
USB-C PD60W Output terminal*	Normal condition	15.27	5s	3.66	8	50.76	100
USB-C PD60W Output terminal*	Normal condition	19.88	5s	3.66	8	66.56	100
USB-C PD60W Output terminal*	Q7 Pin 2-6 SC	5.17	5s	3.65	8	16.96	100
USB-C PD60W Output terminal*	Q5 Pin 3-7 SC	5.17	5s	3.65	8	16.96	100

USB-C PD18W Output terminal*	Normal condition	5.05	5s	3.84	8	16.96	100
USB-C PD18W Output terminal*	Normal condition	9.09	5s	2.46	8	29.66	100
USB-C PD18W Output terminal*	Normal condition	5.05	5s	3.84	8	16.96	100
USB-C PD18W Output terminal*	Q7 PinS-D SC	5.05	5s	3.84	8	16.96	100
USB-C PD18W Output terminal*	Q14 Pin 2-6 SC	5.17	5s	3.65	8	16.96	100
USB1 Output terminal*	Normal condition	5.09	5s	3.75	8	17.07	100
USB1 Output terminal*	Normal condition	9.11	5s	3.78	8	31.76	100
USB1 Output terminal*	Normal condition	12.11	5s	3.77	8	42.12	100
USB1 Output terminal*	U6 Pin 2-3 SC	5.09	5s	3.75	8	17.07	100
USB1 Output terminal*	U6Pin 2-5 SC	5.09	5s	3.75	8	17.07	100

Supplementary Information: SC= short circuit

1) * USB-C PD60W Output terminal load 5Vdc/3A, 9V/3A, 12V/3A,15V/3A, 20V/3A;

2) ** USB-C PD18W Output terminal load 5Vdc/3A, 9V/2A, 12V/1.5A

3) ***USB1 Output terminal load 5Vdc/3A, 9V/2A, 12V/1.5A

T.2, T.3, T.4, T.5	**TABLE: Steady force test**					P
Part/Location	Material	Thickness (mm)	Probe	Force (N)	Test Duration (s)	Observation
Enclosure side (T.4, T.5)	See below	2.2	Test head	100/250	5	Enclosure remained intact, no crack/ opening developed.
Supplementary information:						

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

T.7	TABLE: Drop test				P
Location/part	Material	Thickness (mm)	Height (mm)	Observation	
Enclosure top	See below	2.2	1000	Enclosure remained intact, no crack/ opening developed.	
Enclosure side	See below	2.2	1000	Enclosure remained intact, no crack/ opening developed.	
Enclosure bottom	See below	2.2	1000	Enclosure remained intact, no crack/ opening developed.	
Supplementary information:					

T.8	TABLE: Stress relief test				P
Location/Part	Material	Thickness (mm)	Oven Temperature (°C)	Duration (h)	Observation
Enclosure	See below	See below	70.7	7	Enclosure remained intact, no crack/ opening developed.
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:				

G.5.3	TABLE: transformers						P
Loc.	Tested insulation	Working voltage peak / V (5.4.1.8)	Working voltage rms / V (5.4.1.8)	Required electric strength (5.4.9)	Required clearance / mm (5.4.2.2)	Required creepage distance / mm (5.4.3)	Required distance thr. insul. (5.4.4.6)
Primary to secondary	Reinforced insulation	320	152	4000 Vdc	2.51	5.1	Insulated winding wire used

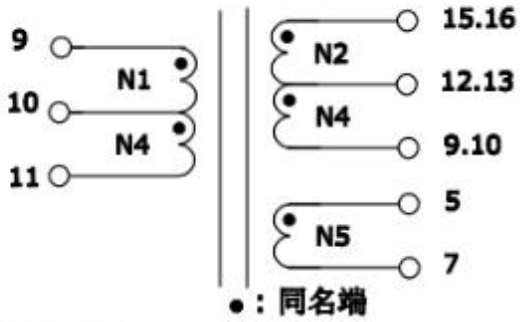
Core to Secondary	Reinforced insulation	320	152	4000 Vdc	2.51	5.1	Insulated winding wire used
Loc.	Tested insulation			Test voltage/ V	Measured clearance / mm	Measured creepage dist./ mm	Measured distance thr. insul. / mm; number of layers
Primary to secondary	Reinforced insulation			4000 Vdc	12.0	12.0	2 layers insulation tape. Insulated winding wire used
Core to Secondary	Reinforced insulation			4000 Vdc	12.0	12.0	2 layers insulation tape. Insulated winding wire used

Supplementary information:

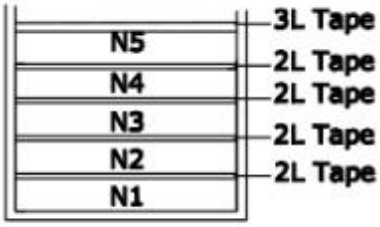
Concentric windings on single bobbin, Two layers of insulation tape wrapped around the transformer; The secondary windings are triple insulated wire, Core is considered as primary; there is an insulation cover under T1 as reinforced insulation. Tube and insulation tape used where primary winding and secondary triple insulated wire can contact at angle between 45 and 90 angle. The primary pins and secondary pin soldered to windings were directly moulded in bobbin.

Construction: (T1)

1.原理图



2.绕线顺序



3.绕线规格

N1

绕组	脚 位 (S-F)	漆包线 规格	圈数	胶带	绕线 方式
N1	1--2	φ0.80*1P	40	2	密绕
N2	15.16--12.	18.25*25铜箔	2	2	密绕
N3	12.13--9.10	0.25*25铜箔	2	2	密绕
N4	2--3	φ0.80*1P	14	2	散绕
N5	5--7	φ0.5*1P	3	3	散绕

4.电器性能

项目	测试点	数值	测试条件	测试设备
电感	PIN1-PIN3	9mH Min	1KHz 0.25V	CH1062
漏感			10KHz 1V Short secondary	CH1062
高压	P,S-C	1.5KVAC	5mA/5S	CHRMA9053
	P-S	2.5KVAC		

5.材料用量

名称	规格型号	用量
骨架	EC4215立式8+8	1个
磁芯	EC4215(pc40)	1付
铜线	2uew 0.50/0.80	15g
铜箔	0.25*24*291	10g
胶带	T13	300mm
胶带	T14	650mm
套管	26L/20L/16L	各30mm

6.备注

a.骨架EC4215 立式(8+8).空4.6.8.11.14脚，2脚剪2/3

b.绕制时Pin1-8朝外，顺时针绕制，排线均匀，无交叉，打结现象。

c.理线挂脚1圈以上，焊锡光亮，无锡尖假焊漏焊现象。

e.浸油抽真空5分钟以上，烘烤4H

f.点固定胶固定。

g.用T13mm胶带包磁芯3Ts，磁芯不可错位。成品外观干净，无油块杂质现象。

4.1.2	TABLE: Critical components information	P

Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity[1)]
Plastic shell	FORMOSA CHEMICALS & FIBRE CORP PLASTICS DIV	AC3600, AC361(x)	PC, V-0, 130°C, Min. Thk: 1.5mm	UL 94 UL 746	UL E162823
Internal thin Wire (Connect to the battery)	DONGGUAN LIUQUAN WIRE CO LTD	1571	26AWG, 80°C, 30Vac	UL 758	UL E327087
Internal thick Wire (Connect to the battery)	DONGGUAN YUE ZHEN WIRE & CABLE CO LTD	3135	10AWG, 200°C, 600Vac	UL 758	UL E354338
Internal Wire (Connect AC Output)	DONGGUAN DANYANG ELECTRONIC WIRE CO LTD	1007	18AWG, 80°C, 300Vac	UL 758	UL E332522
Internal Wire (Cigarette Lighter)	DONGGUAN YUE ZHEN WIRE & CABLE CO LTD	1007	18AWG, 80°C, 300Vac	UL 758	UL E354338
Internal Wire (PCB1 to PCB3)	DONGGUAN YIAO ELECTRONICS CO LTD	3239	22AWG, 200°C, 3000Vdc, VW-1	UL 758	UL E348933
PCB2, PCB3, PCB4	SHENZHEN XSL PRINTED CIRCUIT BOARD CO LTD	XSL-D	V-0, 130°C	UL 94 UL 796	UL E479201
PCB1, PCB5	JIANGXI SUICHUAN TONGMING ELECTRONIC TECHNOLOGY CO LTD	MT-1	V-0, 130°C	UL 94 UL 796	UL E498039
Protect IC (U1, U2, U3)	Feeling Technology Corp.	FP130A	Operating Temperature: -20°C ~125°C, VCC: -0.3~28V, VI: -0.3~28V, OUT Voltage: -0.3~28V	--	Tested with appliance
Protect IC (U4)	INJOINIC TECHNOLOGY	IP2716T	V_{BUS}: 2.7~36V, V_{CC}: 2~30V, V_{DD}: -0.3~2.2V, T_J: -40~125°C	--	Tested with appliance
Protect IC (U5)	Southchip Semiconductor Technology (Shanghai) Co., Ltd.	SC8802QDER	V_{BUS}: -0.3~30V, V_{BAT}: -0.3~3.3V, T_J: -40~125°C	--	Tested with appliance
Protect IC (U13)	Powlicon Inc.	PL5901	VIN: 12~100V, VOUT: 1.2~60V, T_J: -40~125°C	--	Tested with appliance

Protect IC (U18)	icm	CM1041 - DS/DT	Overcharge detection voltage: 4.250±0.025V, Overdischarge detection voltage: 2.70±0.08V, T_{OPR}: -40~85°C	--	Tested with appliance
MOSFET (Q5, Q6, Q7, Q8)	Alpha & Omega Semiconductor	AON6532	V_{DS}: 30V, V_{GS}: ±20V, I_D: 68A (T_C=25°C), T_J: -55~150°C	--	Tested with appliance
MOSFET (Q35)	Cmos	CMD20P03	V_{DS}: -30V, V_{GS}: ±20V, I_D: -19A (T_C=25°C), T_J: -55 to 150°C	--	Tested with appliance
MOSFET (Q37)	SHENZHEN TUOFENG SEMICONDUCTOR TECHNOLOGY CO.,LTD	4884	V_{DS}: 30V, V_{GS}: ±20V, I_D: 9A (T_C=25°C), T_J: -55 to 150°C	--	Tested with appliance
MOSFET (Q43, Q44)	FORSEMI	FS4481	V_{DS}: -30V, V_{GS}: ±20V, I_D: -50A, T_J: -55 to 150°C	--	Tested with appliance
MOSFET (Q46, Q47, Q48, Q49, Q50)	HUAYI Microelectronics	HY4703P/B	V_{DSS}: 30V, V_{GSS}: ±20V, I_D: 275A (T_C=25°C), T_J: 175°C	--	Tested with appliance
Cell	Guangxi Zhuo'neng New Energy Technology Co.,Ltd.	INR18650S-2500mAh	3.7V, 2500mAh	Appendix 9	Tested with appliance
-Electrolyte	Guangzhou Tinci Materials Technology Co.,Ltd.	TC-EZN06	$LiPF_6$+DEC+EC	--	--
-Separator	Shanghai Energy New Material Technology Co.,Ltd.	60.5*0.016mm	PP, 16μm(T), Shutdown temperature: 135°C	--	--
-Positive electrode	HUNAN CHANGYUAN LOCO CO., LTD	LY306	$LiNi_xCo_yMn_{1-x-y}O_2$, Ni: Co: Mn=6: 2: 2, Carbon black, PVDF, Conductive Additive, Aluminum foil,	--	--
-Negative electrode	Shenzhen BTR Nano-teah Co.,Ltd.	NZ-6C	Graphite, CMC, SBR, Conductive Additive, Copper foil	--	--
X2 Capacitor on inverter board (C30)	Tenta Electric Industrial Co. Ltd.	MEX	X2, 0.22μF, 275Vac, 100°C	EN 60384-14	VDE 123198

Inductor LF1	Shenzhen Zhonghe Electronics Co. Ltd.	TM140905-502-01A	T106-125, 2.2mH, 0.75mm, 130°C	---	Tested with appliance
Magnet Wire	PACIFIC ELECTRIC WIRE & CABLE (SHENZHEN) CO LTD	UEW-B	130°C	UL 1446	UL E201757
Heat shrinkable tube of Inductor LF1	SHENZHEN WOER HEAT-SHRINKABLE MATERIAL CO LTD	RSFR	600V, 125°C, VW-1, min. thickness 0.25mm	UL 224	UL E203950
L1	Shenzhen Zhonghe Electronics Co. Ltd.	TM140905-502-01A	T50-125, 10μH, 1.0mm, 130°C	---	Tested with appliance
Magnet Wire	PACIFIC ELECTRIC WIRE & CABLE (SHENZHEN) CO LTD	UEW-B	130°C	UL 1446	UL E201757
Optocoupler (U9, U10)	Everlight Electronics Co., Ltd.	EL817	Double protection optical isolators, providing 3750 Vac isolation, 110°C, Pollution degree: 2, Maximum transient isolation voltage U_{IOTM} (V peak): 6000V, External clearance input-Output(mm): Cr≥7.6mm, Cl≥8.0mm	EN 60747-5-5	VDE 132249
Inverter T1	KE LI WEI YONG ELECTRONIC CO LTD	EC215	Class B, 130°C	IEC 62368-1	Tested with appliance
-Bobbin	Chang Chun Plastics Co Ltd	T375J	Phenolic, V-0	UL 94	UL E59481
-Magnet wire	SHANTOU SHENGANG ELECTRICAL INDUSTRIAL CO LTD	xUEW/155	155°C	UL 1466	UL E239508
-Triple insulated wire	Totoku Electric Co Ltd	TIW-3	155°C	UL 2353	UL E166483
-Insulation tape	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD	PF* (d)(g)	180°C	UL 510	UL E165111
-Tube	Great Holding Industrial Co Ltd	TFT	300V min., 200°C, VW-1	UL 224	UL E156256

-varnish	SUZHOU TAIHU ELECTRIC ADVANCED MATERIAL CO LTD	T-1168(a)	155°C	UL 1446	UL E228349
DC Current Fuse (F1, F3)	DONG GUAN ANDU ELECTRONICS CO LTD	MIN-N30	30A, 32V	UL 248	UL E317400
Lithium-ion Rechargeable Cell	Guangxi Zhuoneng New Energy Technology Co., Ltd.	INR18650S-2500mAh	3.6V, 2500mAh, Maximum charge current: 1250mA, Maximum Discharge: 7500mA, Maximum Charge voltage: 4.2V, Upper limit charge voltage: 4.25V, Lower charge temperature: 0°C, Upper charge temperature: 45°C	IEC 62133: 2012	report No.: SZES190801518201
Protect IC (U2, U6)	NEWTEX ELECTRONICS (SHENZHEN) CO., LTD	D7S625	V_{DAC}: 2.2~5.5V, T_a: -40 to 85°C	--	Tested with appliance
Pulse-Width-Modulation Control Circuits U1 on Inverter Board	Texas Instruments Incorporated	EG8010	Overcharge detection voltage: -0.3V~6.5V, Overdischarge detection voltage: -0.3V~5.5V, T_{opr}: -65°C~125°C	--	Tested with appliance
Electrolytic Capacitor (C6)	Interchangeable	Interchangeable	Min.105 °C, Max.150μF, Min. 400V	--	Tested with appliance
Electrolytic Capacitor (C17, C18)	Interchangeable	Interchangeable	Min.105 °C, Max.200μF, Min. 25V	--	Tested with appliance
Supplementary information: License available upon request					

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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

	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 .**	
3.3.19	**Sound exposure** *Replace 3.3.19 of IEC 62368-1 with the following definitions:*	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
3.3.19.1	**momentary exposure level, MEL** 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. Note 1 to entry: MEL is measured as A-weighted levels in dB. Note 2 to entry: See B.3 of EN 50332-3:2017 for additional information.		N/A
3.3.19.3	**sound exposure, *E*** A-weighted sound pressure (p) squared and integrated over a stated period of time, T Note 1 to entry: The SI unit is Pa^2 s. $E = \int_0^T p(t)^2 \, dt$		N/A
3.3.19.4	**sound exposure level, *SEL*** logarithmic measure of sound exposure relative to a reference value, E_0, typically the 1 kHz threshold of hearing in humans. Note 1 to entry: SEL is measured as A-weighted levels in dB. $SEL = 10 \lg \left(\frac{E}{E_0}\right) \text{ dB}$ Note 2 to entry: See B.4 of EN 50332-3:2017 for additional information.		N/A
3.3.19.5	**digital signal level relative to full scale, dBFS** 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 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.		N/A
2	**Modification to Clause 10**		N/A
10.6	**Safeguards against acoustic energy sources** Replace 10.6 of IEC 62368-1 with the following:		N/A
10.6.1.1	**Introduction** **Safeguard** requirements for protection against long-term exposure to excessive sound pressure levels from personal music players closely coupled to the ear are specified below. Requirements for earphones and headphones intended for use		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	with personal music players are also covered. A personal music player is a portable equipment intended for use by an **ordinary person**, that: – is designed to allow the user to listen to audio or audiovisual content / material; and – uses a listening device, such as headphones or earphones that can be worn in or on or around the ears; and – has a player that can be body worn (of a size suitable to be carried in a clothing pocket) and is intended for the user to walk around with while in continuous use (for example, on a street, in a subway, at an airport, etc.). EXAMPLES Portable CD players, MP3 audio players, mobile phones with MP3 type features, PDAs or similar equipment. Personal music players shall comply with the requirements of either 10.6.2 or 10.6.3. NOTE 1 Protection against acoustic energy sources from telecom applications is referenced to ITU-T P.360. NOTE 2 It is the intention of the Committee to allow the alternative methods for now, but to only use the dose measurement method as given in 10.6.5 in future. Therefore, manufacturers are encouraged to implement 10.6.5 as soon as possible. Listening devices sold separately shall comply with the requirements of 10.6.6. These requirements are valid for music or video mode only. The requirements do not apply to: – professional equipment; NOTE 3 Professional equipment is equipment sold through special sales channels. All products sold through normal electronics stores are considered not to be professional equipment. – hearing aid equipment and other devices for assistive listening; – the following type of analogue personal music players: • long distance radio receiver (for example, a multiband radio receiver or world band radio receiver, an AM radio receiver), and • cassette player/recorder; NOTE 4 This exemption has been allowed because this technology is falling out of use and it is expected that within a few years it will no longer exist. This exemption will not be extended to other technologies. – a player while connected to an external amplifier that does not allow the user to walk around while in use. For equipment that is clearly designed or intended primarily for use by children, the limits of the		

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Clause	Requirement + Test	Result - Remark	Verdict
	relevant toy standards may apply. The relevant requirements are given in EN 71-1:2011, 4.20 and the related tests methods and measurement distances apply.		
10.6.1.2	**Non-ionizing radiation from radio frequencies in the range 0 to 300 GHz** 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.		N/A
10.6.2	**Classification of devices without the capacity to estimate sound dose**		N/A
10.6.2.1	**General** 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. For classifying the acoustic output $L_{\mathrm{Aeq},T}$, measurements are based on the A-weighted equivalent sound pressure level over a 30 s period. For music where the average sound pressure (long term $L_{\mathrm{Aeq},T}$) measured over the duration of the song is lower than the average produced by the programme simulation noise, measurements may be done over the duration of the complete song. In this case, T becomes the duration of the song. NOTE Classical music, acoustic music and broadcast typically has an average sound pressure (long term $L_{\mathrm{Aeq},T}$) which is much lower than the average programme simulation noise. Therefore, if the player is capable to analyse the content and compare it with the programme simulation noise, the warning does not need to be given as long as the average sound pressure of the song does not exceed the required limit. For example, if the player is set with the programme simulation noise to 85 dB, but the average music level of the song is only 65 dB, there is no need to give a warning or ask an acknowledgement as long as the average sound level of the song is not above the basic limit of 85 dB.		N/A
10.6.2.2	**RS1 limits (to be superseded, see 10.6.3.2)** RS1 is a class 1 acoustic energy source that does not exceed the following: – for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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.		
10.6.2.3	**RS2 limits (to be superseded, see 10.6.3.3)** RS2 is a class 2 acoustic energy source that does not exceed the following: – for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or when the combination of player and listening device is known by other means such as setting or automatic 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	**RS3 limits** RS3 is a class 3 acoustic energy source that exceeds RS2 limits.		N/A
10.6.3	**Classification of devices (new)**		N/A
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		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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.		
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 during tests. Measurements shall be made in accordance with EN 50332-1 or EN 50332-2 as applicable.		N/A
10.6.4.2	**Protection of persons** Except as given below, protection requirements for parts **accessible** to **ordinary persons**, **instructed persons** and **skilled persons** are given in 4.3. NOTE 1 Volume control is not considered a **safeguard.** Between RS2 and an **ordinary person**, the **basic safeguard** may be replaced by an **instructional safeguard** in accordance with Clause F.5, except that the **instructional safeguard** shall be placed on the equipment, or on the packaging, or in the instruction manual. Alternatively, the **instructional safeguard** may be		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	given through the equipment display during use. The elements of the **instructional safeguard** shall be as follows: – element 1a: the symbol  , IEC 60417-6044 (2011-01) – element 2: “High sound pressure” or equivalent wording – element 3: “Hearing damage risk” or equivalent wording – element 4: “Do not listen at high volume levels for long periods.” or equivalent wording An **equipment safeguard** shall prevent exposure of an **ordinary person** to an RS2 source without intentional physical action from the **ordinary person** and shall automatically return to an output level not exceeding what is specified for an RS1 source when the power is switched off. The equipment shall provide a means to actively inform the user of the increased sound level when the equipment is operated with an output 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. NOTE 2 Examples of means include visual or audible signals. Action from the user is always needed. NOTE 3 The 20 h listening time is the accumulative listening time, independent of how often and how long the personal music player has been switched off. A **skilled person** shall not be unintentionally exposed to RS3.		
10.6.5	**Requirements for dose-based systems**		N/A
10.6.5.1	**General requirements** Personal music players shall give the warnings as provided below when tested according to EN 50332-3, using the limits from this clause. The manufacturer may offer optional settings to allow the users to modify when and how they wish to receive the notifications and warnings to promote a better user experience without defeating the safeguards. This allows the users to be informed in a method that best meets their physical capabilities and device usage needs. If such optional settings are offered, an administrator (for example, parental restrictions, business/educational administrators, etc.) shall be		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	able to lock any optional settings into a specific configuration. The personal music player shall be supplied with easy to understand explanation to the user of the dose management system, the risks involved, and how to use the system safely. The user shall be made aware that other sources may significantly contribute to their sound exposure, for example work, transportation, concerts, clubs, cinema, car races, etc.		
10.6.5.2	**Dose-based warning and requirements** When a dose of 100 % CSD is reached, and at least at every 100 % further increase of CSD, the device shall warn the user and require an acknowledgement. In case the user does not acknowledge, the output level shall automatically decrease to compliance with class RS1. The warning shall at least clearly indicate that listening above 100 % CSD leads to the risk of hearing damage or loss.		N/A
10.6.5.3	**Exposure-based requirements** With only dose-based requirements, cause and effect could be far separated in time, defying the purpose of educating users about safe listening practice. In addition to dose-based requirements, a PMP shall therefore also put a limit to the short-term sound level a user can listen at. The exposure-based limiter (EL) shall automatically reduce the sound level not to exceed 100 dB(A) or 150 mV integrated over the past 180 s, based on methodology defined in EN 50332-3. The EL settling time (time from starting level reduction to reaching target output) shall be 10 s or faster. 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. NOTE In case the source is known not to be music (or test signal), the EL may be disabled.		N/A
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		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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.		
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** *Measurements shall be made in accordance with EN 50332-2 as applicable.*		N/A
3	**Modification to the whole document**		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	Delete all the "country" notes in the reference document according to the following list:		N/A

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**		N/A
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.*		N/A

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

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Clause	Requirement + Test	Result - Remark	Verdict
8	**Modification to 10.5.1**		N/A
10.5.1	***Add** the following after the first paragraph:* For RS 1 compliance is checked by measurement under the following conditions: 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. NOTE Z1 Soldered joints and paint lockings are examples of adequate locking. The dose-rate is determined by means of a radiation monitor with an effective area of 10 cm², at any point 10 cm from the outer surface of the apparatus. Moreover, the measurement shall be made under fault conditions causing an increase of the high voltage, provided an intelligible picture is maintained for 1 h, at the end of which the measurement is made. For RS1, the dose-rate shall not exceed 1 µSv/h taking account of the background level. NOTE Z2 These values appear in Directive 96/29/Euratom of 13 May 1996.		N/A
9	**Modification to G.7.1**		N/A
G.7.1	***Add** the following note:* NOTE Z1 The harmonized code designations corresponding to the IEC cord types are given in Annex ZD.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

10	**Modification to Bibliography**		
	Add the following notes for the standards indicated: 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.		N/A
11	**ADDITION OF ANNEXES**		N/A
ZB	**ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)**		N/A
4.1.15	**Denmark, Finland, Norway** and **Sweden** To the end of the subclause the following is added: **Class I pluggable equipment type A** intended for connection to other equipment or a network shall, if safety relies on connection to reliable earthing or if surge suppressors are connected between the network terminals and **accessible** parts, have a marking stating that the equipment shall be connected to an earthed **mains** socket-outlet. The marking text in the applicable countries shall be as follows: In **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”		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
4.7.3	**United Kingdom** To the end of the subclause the following is added: The torque test is performed using a socket-outlet complying with BS 1363, and the plug part shall be assessed to the relevant clauses of BS 1363. Also see Annex G.4.2 of this annex		N/A
5.2.2.2	**Denmark** After the 2nd paragraph add the following: 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.		N/A
5.4.11.1 and Annex G	**Finland and Sweden** To the end of the subclause the following is added: For separation of the telecommunication network from earth the following is applicable: If this insulation is solid, including insulation forming part of a component, it shall at least consist of either • two layers of thin sheet material, each of which shall pass the electric strength test below, or • one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below. If this insulation forms part of a semiconductor component (e.g. an optocoupler), there is no distance through insulation requirement for the insulation consisting of an insulating compound completely filling the casing, so that clearances and creepage distances do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition • passes the tests and inspection criteria of 5.4.8 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), and • is subject to routine testing for electric strength during manufacturing, using a test voltage of 1,5 kV. It is permitted to bridge this insulation with a capacitor complying with EN 60384-14:2005, subclass Y2. A capacitor classified Y3 according to EN 60384-		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	14:2005, may bridge this insulation under the following conditions: • the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 60384-14, which in addition to the Y3 testing, is tested with an impulse test of 2,5 kV defined in 5.4.11; • the additional testing shall be performed on all the test specimens as described in EN 60384-14; the impulse test of 2,5 kV is to be performed before the endurance test in EN 60384-14, in the sequence of tests as described in EN 60384-14.		
5.5.2.1	**Norway** After the 3rd paragraph the following is added: Due to the IT power system used, capacitors are required to be rated for the applicable line-to-line voltage (230 V).		N/A
5.5.6	**Finland, Norway** and **Sweden** To the end of the subclause the following is added: Resistors used as **basic safeguard** or bridging **basic insulation** in **class I pluggable equipment type A** shall comply with G.10.1 and the test of G.10.2.		N/A
5.6.1	**Denmark** **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. *Justification:* In Denmark an existing 13 A socket outlet can be protected by a 20 A fuse.		N/A
5.6.4.2.1	**Ireland and United Kingdom** After the indent for **pluggable equipment type A**, the following is added: – the **protective current rating** is taken to be 13 A, this being the largest rating of fuse used in the **mains** plug.		N/A

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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

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Clause	Requirement + Test	Result - Remark	Verdict
5.7.6.2	**Denmark** 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 .		N/A
5.7.7.1	**Norway and Sweden** To the end of the subclause the following is added: The screen of the television distribution system is normally not earthed at the entrance of the building and there is normally no equipotential bonding system within the building. Therefore the protective earthing of the building installation needs to be isolated from the screen of a cable distribution system. It is however accepted to provide the insulation external to the equipment by an adapter or an interconnection cable with galvanic isolator, which may be provided by a retailer, for example. The user manual shall then have the following or similar information in Norwegian and Swedish language respectively, depending on in what country the equipment is intended to be used in: “Apparatus connected to the protective earthing of the building installation through the mains connection or through other apparatus with a connection to protective earthing – and to a television distribution system using coaxial cable, may in some circumstances create a fire hazard. Connection to a television distribution system therefore has to be provided through a device providing electrical isolation below a certain frequency range (galvanic isolator, see EN 60728-11)” NOTE In Norway, due to regulation for CATV-installations, and in Sweden, a galvanic isolator shall provide electrical insulation below 5 MHz. The insulation shall withstand a dielectric strength of 1,5 kV r.m.s., 50 Hz or 60 Hz, for 1 min. Translation to Norwegian (the Swedish text will also be accepted in Norway): “Apparater som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkoplet utstyr – og er tilkoplet et koaksialbasert kabel-TV nett, kan forårsake brannfare. For å unngå dette skal det ved tilkopling av apparater til kabel-TV nett installeres en galvanisk isolator mellom apparatet og kabel-TV nettet.” Translation to Swedish: ”Apparater som är kopplad till skyddsjord via jordat		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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.”.		
8.5.4.2.3	**United Kingdom** Add the following after the 2nd dash bullet in 3rd paragraph: An emergency stop system complying with the requirements of IEC 60204-1 and ISO 13850 is required where there is a risk of personal injury.		N/A
B.3.1 and B.4	**Ireland and United Kingdom** The following is applicable: To protect against excessive currents and short-circuits in the primary circuit of **direct plug-in equipment**, tests according to Annexes B.3.1 and B.4 shall be conducted using an external miniature circuit breaker complying with EN 60898-1, Type B, rated 32A. If the equipment does not pass these tests, suitable protective devices shall be included as an integral part of the **direct plug-in equipment**, until the requirements of Annexes B.3.1 and B.4 are met		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
G.4.2	**Denmark** To the end of the subclause the following is added: 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. CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a. If a single-phase equipment having a RATED CURRENT exceeding 13 A or if a 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. 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. Other current rating socket outlets shall be in compliance with Standard Sheet DKA 1-3a or DKA 1-1c. 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 *Justification:* Heavy Current Regulations, Section 6c		N/A
G.4.2	**United Kingdom** To the end of the subclause the following is added: The plug part of direct plug-in equipment shall be assessed to BS 1363: Part 1, 12.1, 12.2, 12.3, 12.9, 12.11, 12.12, 12.13, 12.16, and 12.17, except that the test of 12.17 is performed at not less than 125 °C. Where the metal earth pin is replaced by an Insulated Shutter Opening Device (ISOD), the requirements of clauses 22.2 and 23 also apply.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
G.7.1	**United Kingdom** To the first paragraph the following is added: Equipment which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to BS 1363 by means of that flexible cable or cord shall be fitted with a 'standard plug' in accordance with the Plugs and Sockets etc. (Safety) Regulations 1994, Statutory Instrument 1994 No. 1768, unless exempted by those regulations. NOTE "Standard plug" is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug.		N/A
G.7.1	**Ireland** To the first paragraph the following is added: Apparatus which is fitted with a flexible cable or cord shall be provided with a plug in accordance with Statutory Instrument 525: 1997, "13 A Plugs and Conversion Adapters for Domestic Use Regulations: 1997. S.I. 525 provides for the recognition of a standard of another Member State which is equivalent to the relevant Irish Standard		N/A
G.7.2	**Ireland and United Kingdom** To the first paragraph the following is added: A power supply cord with a conductor of 1,25 mm^2 is allowed for equipment which is rated over 10 A and up to and including 13 A.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

ZC	**ANNEX ZC, NATIONAL DEVIATIONS (EN)**		N/A
10.5.2	**Germany** The following requirement applies: For the operation of any cathode ray tube intended for the display of visual images operating at an acceleration voltage exceeding 40 kV, authorization is required, or application of type approval (Bauartzulassung) and marking. *Justification*: German ministerial decree against ionizing radiation (Röntgenverordnung), in force since 2002-07-01, implementing the European Directive 96/29/EURATOM. **NOTE** Contact address: Physikalisch-Technische Bundesanstalt, Bundesallee 100, D-38116 Braunschweig, Tel.: Int+49-531-592-6320, Internet: http://www.ptb.de		N/A

IEC62368_1E- ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

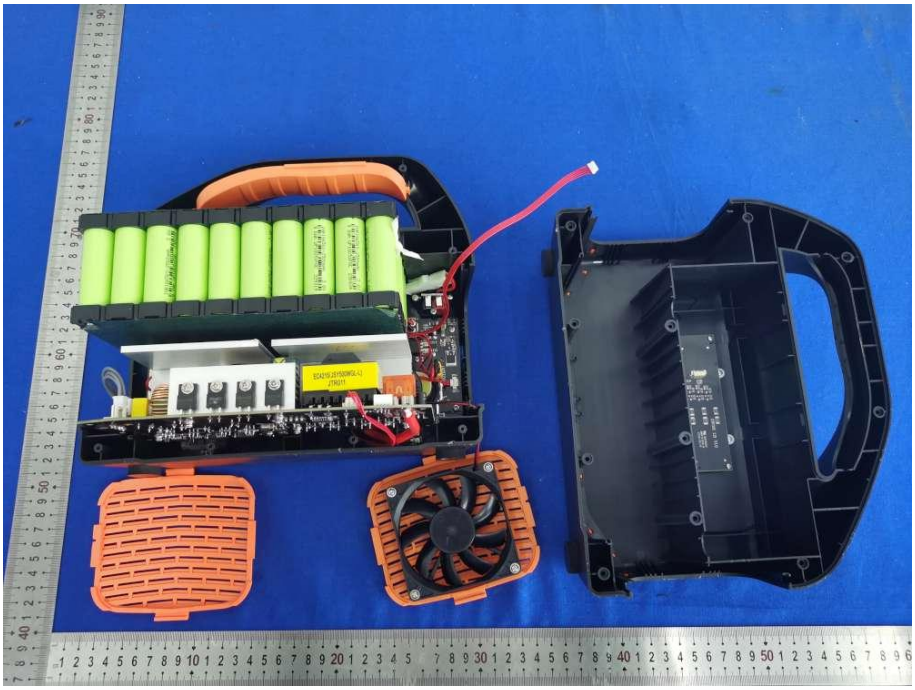
ZD	**IEC and CENELEC CODE DESIGNATIONS FOR FLEXIBLE CORDS (EN)**	N/A
		N/A

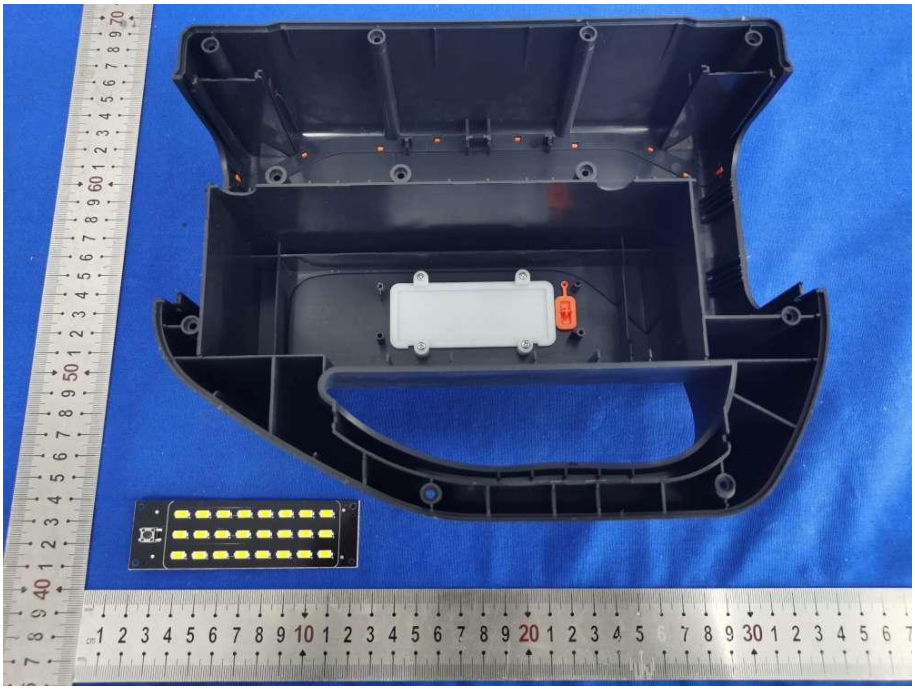
Type of flexible cord	Code designations	
	IEC	CENELEC
PVC insulated cords		
Flat twin tinsel cord	60227 IEC 41	H03VH-Y
Light polyvinyl chloride sheathed flexible cord	60227 IEC 52	H03VV-F H03VVH2-F
Ordinary polyvinyl chloride sheathed flexible cord	60227 IEC 53	H05VV-F H05VVH2-F
Rubber insulated cords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

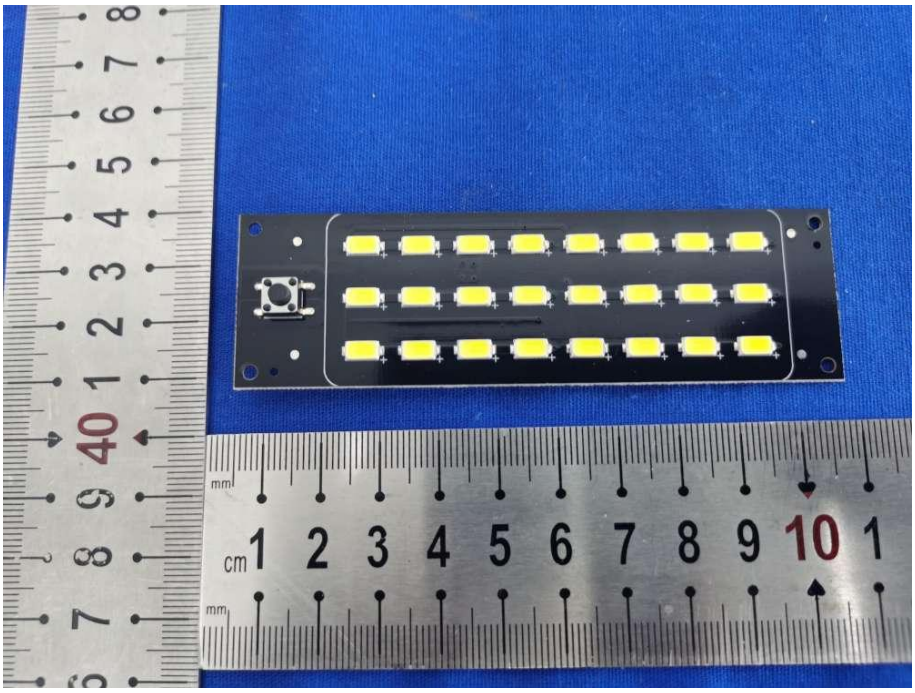
Note: 1. Before placing the products in the different countries, the manufacturer must ensure that:
2. Operating Instructions, Ratings Labels and Warnings Labels written in an Accepted or Official Language of the county in question.
3. The equipment complies with the National Standards and/or Electrical Codes of the country in question.

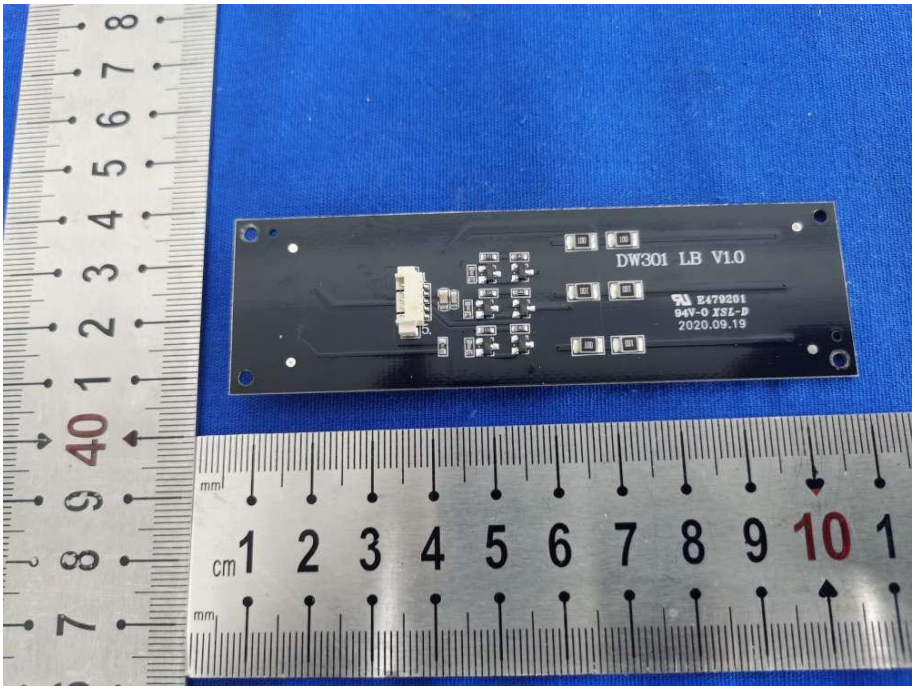
Photos

Model: DW501





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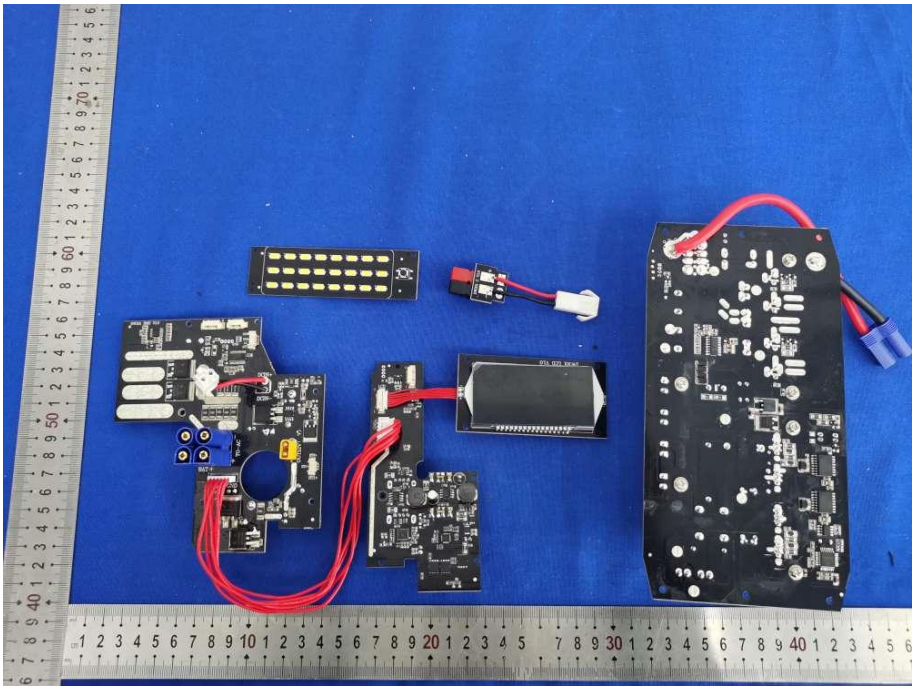
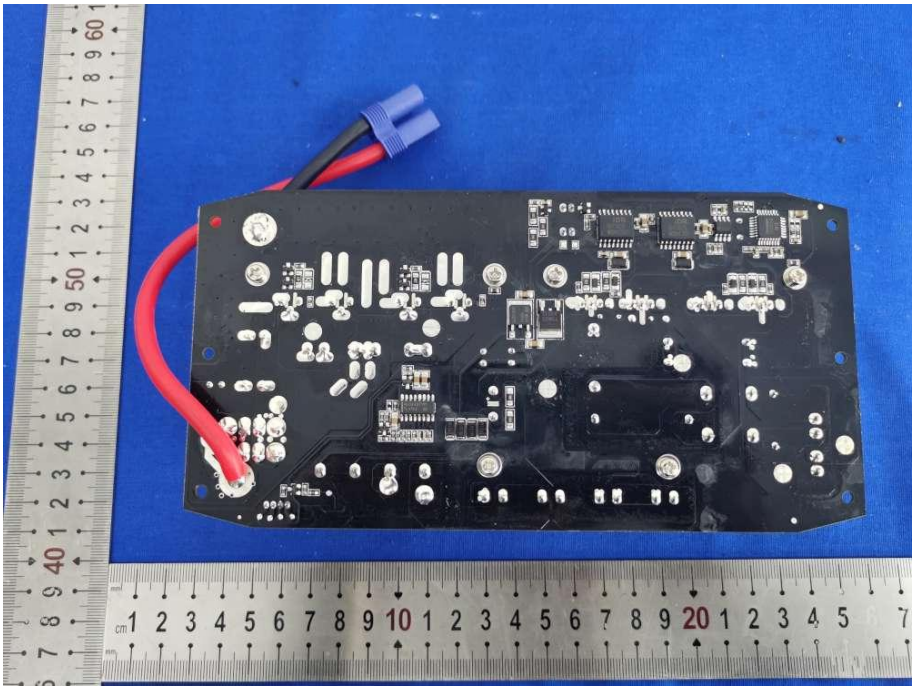
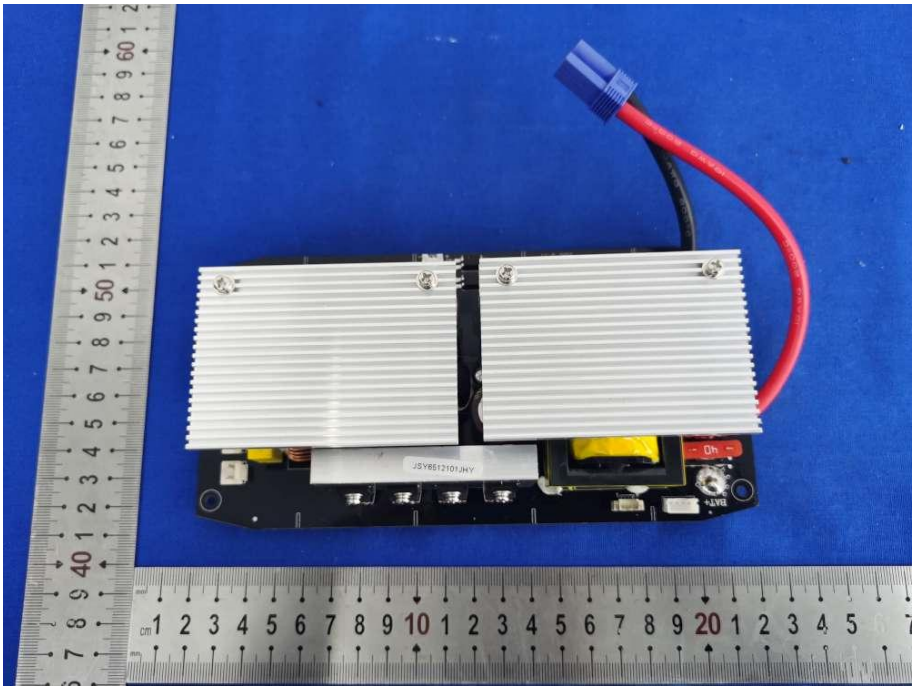
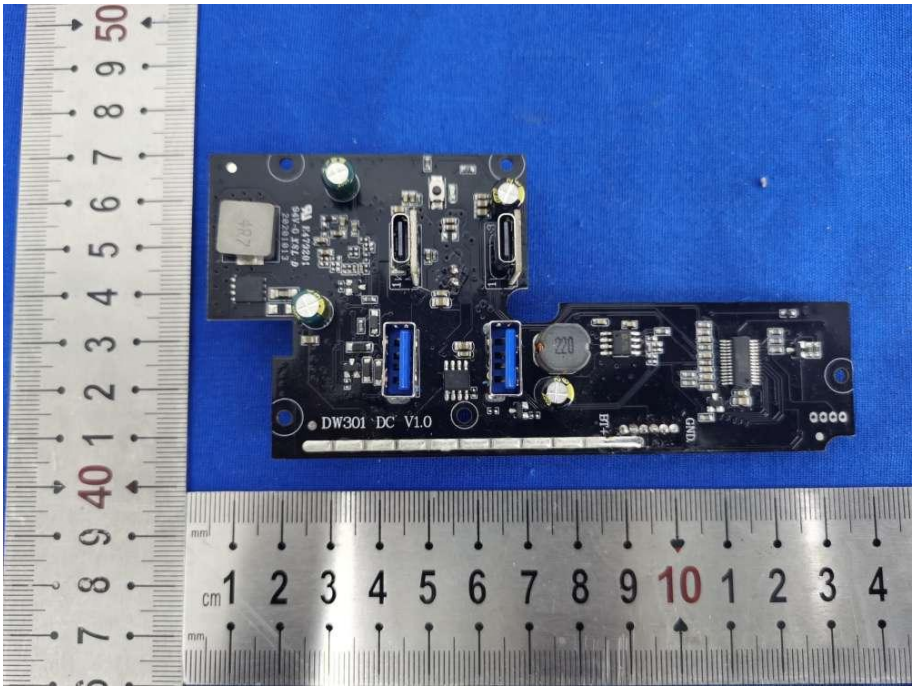
2020.09.19





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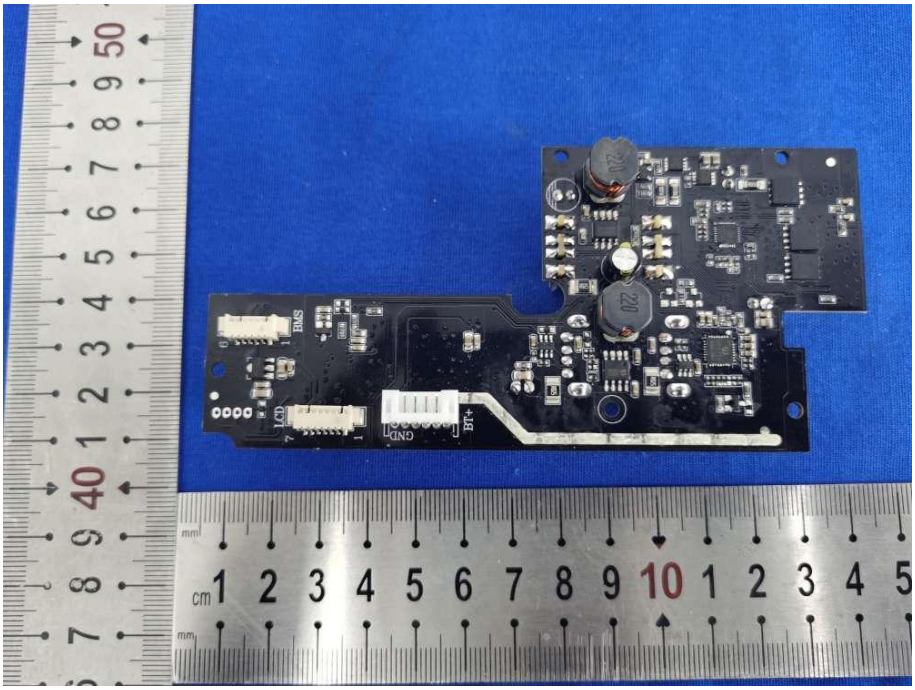
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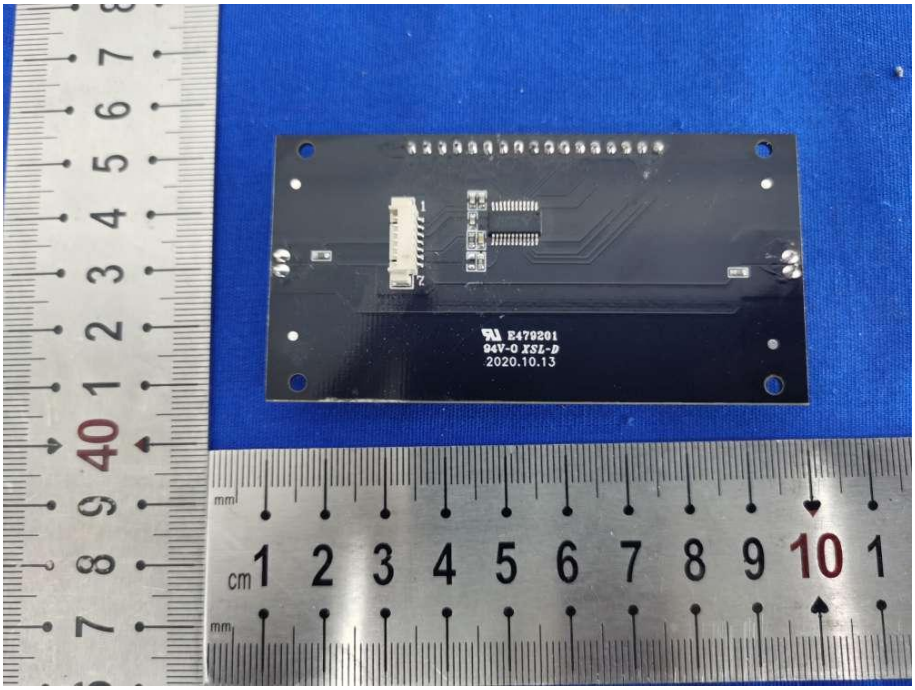
GND
BT+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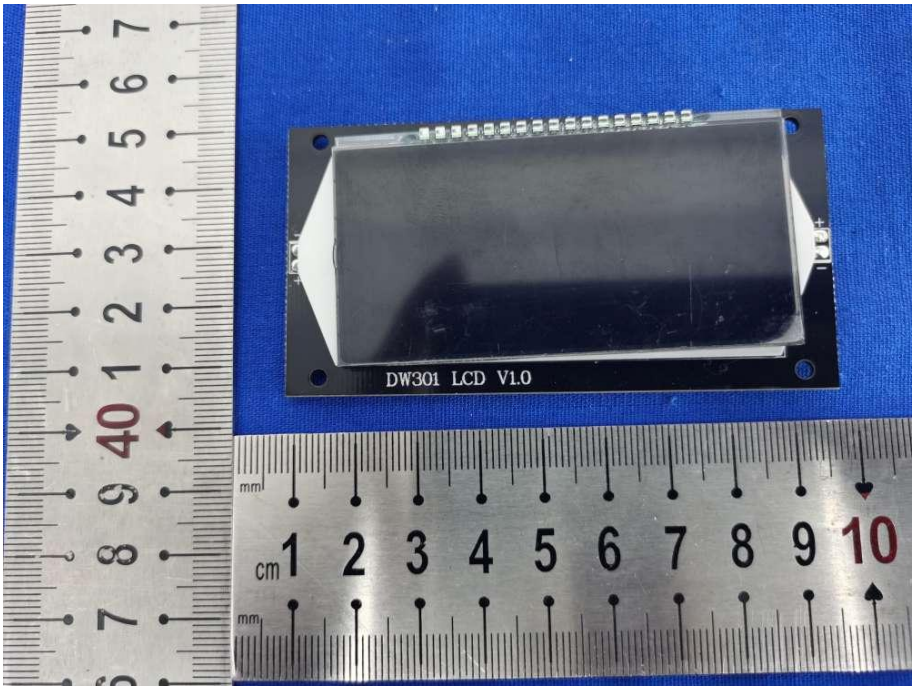
2020.10.13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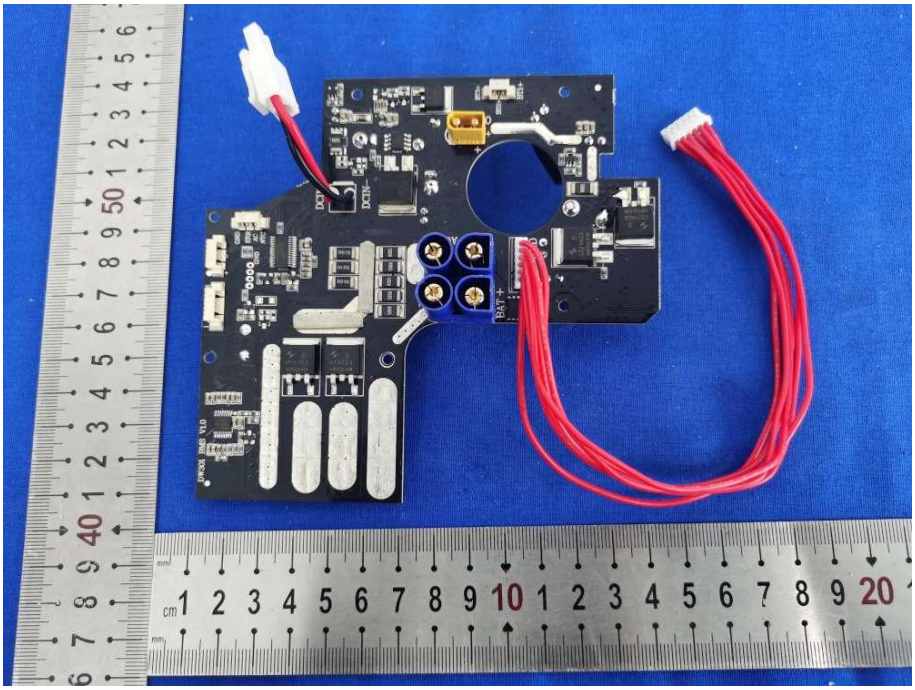
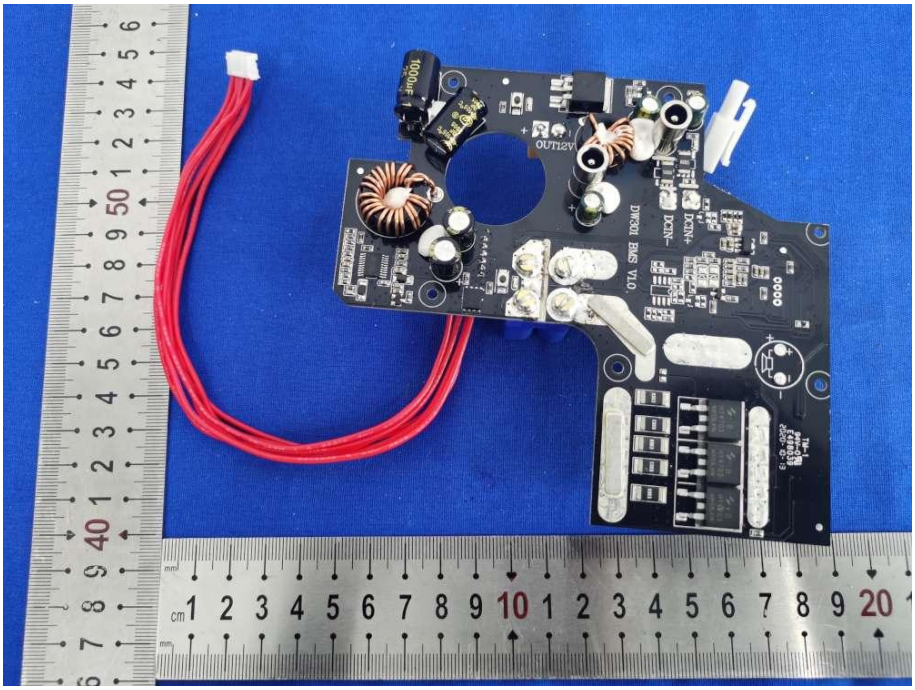
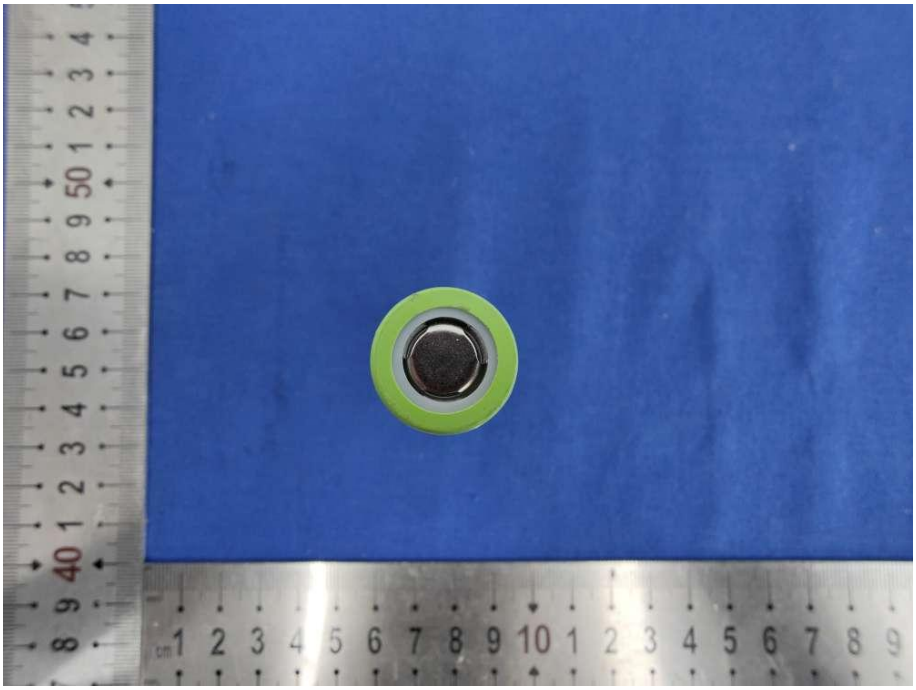



1000uF
OUT12V
DCIN+
DCIN-
DW301 BMS V1.0


INR18650S-2500mAh 3.6V
9.0Wh VE1P041FQB 209724



****** The end ******