SMART ZONE TECHNOLOGY LIMITED

TEST REPORT

Prepared For:	SMART ZONE TECHNOLOGY LIMITED Flat A501, 5/ F., Great Wall Fty Bldg., 11 Cheung Shun St., Lai Chi Kok, Kowloon, HK
Product Name	ADAPTOR WITH 4 USB OUTPUTS
Main Test Model:	4USB
Prepared By :	Shenzhen BST Technology Co., Ltd. Building No.23-24,Zhiheng Industrial Park,Guankouer Road,Nantou,Nanshan District,Shenzhen,Guangdong,China
Test Date:	January 20, 2015 - February 02, 2015
Date of Report :	February 03, 2015
Report No.:	BST1501400890001Y-1SR-2

TEST REPORT

IEC 60335-2-29

Safety of household and similar electrical appliances

Part 2: Particular requirements for Battery charger

Testing laboratory	
Name.....:	Shenzhen BST Technology Co., Ltd.
Address.....:	Building No.23-24,Zhiheng Industrial Park,Guankouer Road,Nantou, Nanshan District,Shenzhen,Guangdong,China
Testing location.....:	Same as above
Client	
Name.....:	SMART ZONE TECHNOLOGY LIMITED
Address.....:	Flat A501, 5/ F., Great Wall Fty Bldg., 11 Cheung Shun St., Lai Chi Kok, Kowloon, HK
Test specification	
Standard .....:	IEC 60335-2-29:2010 IEC 60335-1:2010+A1:2013
Procedure deviation.....:	N.A.
Non-standard test method.....:	N.A.
Test item	
Description .....:	ADAPTOR WITH 4 USB OUTPUTS
Trademark.....:	N.A.
Model and/or type reference .....:	SEE PAGE 1
Manufacturer.....:	SMART ZONE TECHNOLOGY LIMITED
Address.....	Flat A501, 5/ F., Great Wall Fty Bldg., 11 Cheung Shun St., Lai Chi Kok, Kowloon, HK
Rating(s).....:	Input: 100-240V~, 50/60Hz,470mA Output: 5Vdc, 3.1A

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

General remarks

"This report is not valid as a CB Test Report unless appended to a CB Test Certificate issued by a NCB, in accordance with IECEE 02".

This test report shall not be reproduced except in full without the written approval of the testing laboratory.

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

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

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

Throughout this report a comma is used as the decimal separator.

Copy of marking plate

Product: ADAPTOR WITH 4 USB OUTPUTS
Model: 4USB
Input: 100-240V~, 50/60Hz,470mA
Output: 5Vdc, 3.1A

SMART ZONE TECHNOLOGY LIMITED

Prepared by : Rain Zhang
Engineer

Reviewer :
Supervisor

Approved & Authorized Signer : Christina
Christina / Manager

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
4	GENERAL REQUIREMENT		---
	Appliance shall be constructed so that in normal use they function safely so as to cause no danger to persons or surroundings, even in the event of carelessness that may occur in normal use		P
	In general this principle is achieved by fulfilling the relevant requirements specified in this standard and compliance is checked by carrying out all the relevant tests	All the relevant tests are carried out	P
5	GENERAL CONDITIONS FOR THE TESTS		---
	Unless otherwise specified, the tests are carried out in accordance with this clause		P
5.1	Tests according to this standard are type tests		P
5.2	Tests are carried out on a single appliance that shall withstand all the relevant tests		P
	If the test of 21.101 is carried out, two additional battery chargers are requirement. (IEC 60335-2-29: 04)		N
5.3	The tests are carried out in the order of the clauses		P
5.4	When testing appliances that are also supplied by other energies such as gas, the influence of their consumption has to be taken into account	No such construction	N
5.5	The tests are carried out with the appliance placed in the most unfavourable position that may occur in normal use.	Placed in test corner	P
5.6	If the setting can be altered by the user, tests shall be adjusted to their most unfavourable setting	No such setting	N
5.7	Tests are carried out at a temperature of 20℃±5℃.	Tests are carried out at ambient of 25℃	P
5.8.1	For a.c. only, tested at rated frequency (IEC 60 335-1:02)	Tested with 50Hz	P
5.8.2	For a.c./d.c., tested at the most unfavourable supply (IEC 60 335-1:02)	See 11.5	P
5.8.3	For heating appliance, it operated at rated power input range		N
5.9	Alternative heating elements, the appliance is tested in the most unfavourable results	No heating appliance	N

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
5.10	The tests are carried out on the appliance as supplied		P
5.11	Flexible cord appliance are tested with the appropriate flexible cord connected to the appliance		P
5.12	For heating appliance, only to heating elements without appreciable positive temperature coefficient of resistance	No heating appliance	N
5.13	Appliance with PTC heating elements are carried out at a voltage corresponding to the specified power input	No PTC heating elements	N
5.14	If class 0I appliance or class I appliance have accessible metal parts that are not earthed, such parts are checked for class II construction	Class II appliances	N
5.15	If appliance have parts operating at safety extra-low voltage, such parts are checked for class III construction		N
5.16	When testing electronic circuits, the supply is to be free from perturbations		P
5.17	Appliance powered by rechargeable batteries are tested in accordance with annex B		N
5.18	If liner and angular dimensions are specified without a tolerance, ISO2768-1 is applicable		P
5.101	Unless otherwise specified, battery charger are tested as motor-operated (IEC 603335-2-29: 04)		P
6	CLASSIFICATION		---
6.1	Protection against electric shock: Class I, II, III (IEC 60 335-1:02) .....:	Class II appliance	P
6.2	Protection against harmful ingress of water	IPX0	N

7	MARKING		---
7.1	Rated voltage or voltage range (V) .....:	100-240V	P
	Single-phase appliances: 230 V covered (IEC 60 335-1:02)	230V covered	P
	Multi-phase appliances: 400 V covered (IEC 60 335-1:02)	Single-phase appliances	N
	Nature of supply	~	P

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Cl.	Requirement – Test	Result	Verdict
	Rated frequency or frequency range (Hz) .....:	50/60Hz	P
	Rated input or rated current		N
	Manufacturer's or responsible vendor's name, trademark or identification mark	See page 2	P
	Model or type reference	See page 2	P
	Symbol for Class II	See marking label	N
	IP number	IPX0	N
	Battery chargers shall be marked with (IEC 60 335-2-29:04):		---
	- rated d.c. output voltage (V) (IEC 60 335-2-29:04):	5Vdc	P
	- rated d.c. output current (A) (IEC 60 335-2-29:04) .....:		P
	- rated current (A) of protective devices incorporated in a d.c. distribution board (IEC 60 335-2-29:04):	No d.c. distribution board	N
	- polarity of output terminals (+/-) (IEC 60 335-2-29:04)		P
	- time-current characteristic of fuse-links of the time-lag type (IEC 60 335-2-29:04)	No such fuse links	N
	If the output exceeds 20 VA (IEC 60 335-2-29:04):		---
	- before charging, read instructions (IEC 60 335-2-29:04)		N
	- for indoor use, or do not expose to rain (unless appliance is at least IPX4) (IEC 60 335-2-29:04)	IPX0	N
	If output exceeds 20 VA and battery charger is suitable for charging lead-acid batteries (IEC 60 335-2-29:04):		---
	- disconnect the supply before making or breaking connections to the battery (IEC 60 335-2-29:04)		N
	- warning: Explosive gases – Prevent flames and sparks – Provide adequate ventilation during charging (IEC 60 335-2-29:04)		N
	D.C. distribution boards marked with (IEC 60 335-2-29:04):		---
	- maximum output current (A) for each output circuit (IEC 60 335-2-29:04) :	No D.C. distribution boards	N
	- types of any additional power supply which may be connected (IEC 60 335-2-29:04)		N

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
	Battery chargers incorporating an engine cranking switch allowing the charger to supply a supplementary starting current for the engine marked with (IEC 60 335-2-29:04):		---
	- maximum ON time (IEC 60 335-2-29:04)		N
	- minimum OFF time or maximum ratio between ON and OFF time (IEC 60 335-2-29:04)		N
7.2	Warning for stationary appliances	No such stationary appliance	N
	Warning placed in vicinity of terminal cover		N
7.3	Range of rated values correctly marked		P
7.4	Voltage setting clearly discernible	No such setting	N
	Output voltage clearly discernible if the battery charger can be adjusted to different d.c. output voltages (IEC 60 335-2-29:04)	No such devices	N
7.5	Marking of rated input for each rated voltage		N
	Marking for upper and lower limits of rated input		N
7.6	Correct symbols used	See marking label	P
7.7	Correct connection diagram, fixed to the appliance	No connection diagram	N
7.8	Not for type Z attachment:	Type Y attachment	---
	- marking of terminals for the neutral conductor (N)		N
	- marking of protect earthing terminals		N
	- marking not placed on removable parts		P
	- marking of terminal for single-pole protective device	No such protective device	N
7.9	Marking or placing of switches which may cause a hazard	No such switch	P
7.10	Indications of switches and regulating devices by use of figures, letters or other		P
	The figure 0 indicates only OFF position, unless no confusion with the OFF position		N
7.11	Indication for direction of adjustment of controls	No controls	N
7.12	Instructions for safe use provided	See operation manual	P
	Instruction sheet contains (IEC 60 335-2-29:04):		---
	- Specification of types, number of cells and rated capacity in ampere-hours of batteries which can be charged (IEC 60 335-2-29:04)		P

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
	- warning against recharging of non-rechargeable batteries (IEC 60 335-2-29:04)		P
	- statement that during charging the battery must be placed in a well ventilated area (only for chargers for lead-acid batteries) (IEC 60 335-2-29:04)	Not for lead-acid batteries	N
	- statement that chargers must only be plugged-in to an earthed socket-outlet (only for Class I battery chargers) (IEC 60 335-2-29:04)		P
	- explanation of automatic function, statement of limitations (only for automatic battery chargers) (IEC 60 335-2-29:04)	No automatic battery chargers	N
	- substance concerning connection and disconnection of automobile batteries to the charger (only for battery chargers for charging automobile batteries) (IEC 60 335-2-29:04)		N
7.12.1	Sufficient details for installation or maintenance supplied	See manual	P
7.12.2	Means for disconnection with contact separation at least 3 mm	Portable appliances	N
	Stationary appliance with supply cord and plug: statement in the instructions that the appliance is so positioned that the plug is accessible (IEC 60 335-1:02)		N
7.12.3	Insulation in contact with parts exceeding 50 K; instruction		N
7.12.4	Information with regard to built-in:	No built-in appliance	N
	- dimensions of space		N
	- dimensions and position of support		N
	- ventilation openings		N
	- connection/interconnection plug accessible		N
	Instruction that connection to the supply mains has to be in accordance with the national wiring rules (only for battery chargers for installing in caravans) (IEC 60 335-2-29:04)	Portable appliances	N
7.12.5	Replacement cord, type X attachment		N
	Replacement cord, type Y attachment	Type Y attachment	N
	Replacement cord, type Z attachment		N
7.13	Instructions and other texts in official language	In English	P

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Cl.	Requirement – Test	Result	Verdict
7.14	Marking easily legible and durable	After testing, legible and durable	P
7.15	Marking on a main part		P
	Marking clearly discernible from outside		P
	Stationary appliance: name or trademark and model or type reference visible after installation	No stationary appliance	N
	Indication for switches and controls in vicinity of components; not on removable parts if misleading	No switches	N
7.16	Marking of a possible replaceable thermal link or fuse link clearly visible with regard to replacing the link		P

8	PROTECTION AGAINST ACCESS TO LIVE PARTS		---
8.1	Adequate protection against accidental contact with live parts	No hazards	P
8.1.1	All positions; detachable parts removed	No hazards	P
	Removal of lamps: protection against contact with live parts	No such lamps	N
	Use of test finger: no contact with live parts	No hazards	P
8.1.2	Use of test pin: no contact with live parts (IEC 60 335-1:02)	No hazards	P
8.1.3	Use of test probe: no contact with live parts of visible glowing heating elements	No visible glowing heating elements	N
8.1.4	Accessible part not considered live if:	No hazards	---
	- extra-low a.c. voltage: peak values not exceeding 42,4 V		N
	- extra-low d.c. voltage: not exceeding 42,4 V		P
	- or separated from live parts by protective impedance, d.c. current not exceeding 2 mA		N
	- or separated from live parts by protective impedance, a.c. peak value not exceeding 0,7 mA		N
	- for peak value 42,4 V up to and including 450 V capacitance not exceeding 0,1 μF		N
	- for peak value 450 V up to and including 15 kV capacitance not exceeding 0,1 μF		N

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Cl.	Requirement – Test	Result	Verdict
8.1.5	Live parts protected at least by basic insulation before installation or assembly: checked by inspection and the test of 8.1.1 (IEC 60 335-1:02):		---
	- built-in appliances		N
	- fixed appliances		N
	- separate units		N
8.2	Class II appliances and constructions adequately protected against accidental contact with basic insulation and metal parts separated from live parts with only basic insulation		P
	Only possible to touch parts separated from live parts by double or reinforced insulation	The DC output terminals	P

10	POWER INPUT AND CURRENT		---
10.1	Power input at rated voltage and normal operating temperature not deviating from rated input by more than shown in table; measured power input (W); rated input (W); deviation:	(see appended table 10.1)	P
10.2	Current at normal operating temperature not deviating from rated current by more than shown in table; measured current at rated voltage under normal operation (A); rated current (A); deviation:		N
10.101	No-load d.c. output voltage does not exceed 42,4 V (IEC 60 335-2-29:04)	5Vd.c.	P
10.102	Arithmetic mean value of output current does not deviate from rated d.c. output current by more than 10%; deviation (IEC 60 335-2-29:04) :	Output current not more than 10%	P
11	HEATING		---
11.1	No excessive temperatures in normal use	Comply with requirements	P
11.2	Battery chargers are placed in the test corner as specified for heating appliances (IEC 60 335-2-29:04)	Placed in test corner	P
11.3	Temperature rises determined by thermocouples or resistance method	By thermocouples method	P
11.4	Heating appliances operated under normal operation at 1,15 times rated power input	No heating appliances	N
11.5	Battery chargers only supplied at 1,06 times rated voltage (IEC 60 335-2-29:04)	240V x 1,06 =254.4V	P

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
11.6	Combined appliances operated under normal operation, supply voltage at most unfavourable voltage between 0,94 and 1,06 times rated voltage	No Combined appliances	N
11.7	Battery chargers are operated until steady conditions are established (IEC 60 335-2-29:04)		P
11.8	Protective devices do not operate	Not operate	P
	Sealing compound not flowing out	No sealing compound	N
	Temperatures not exceeding values in table 3 (IEC 60 335-1:02)	(see appended table 11.8)	P

13	LEAKAGE CURRENT		---
13.1	Leakage current not excessive and electric strength adequate		P
13.2	Leakage current measured by means of circuit described in Annex G		P
	Leakage current measurements	(see appended table 13.2)	P
13.3	Electric strength test of insulation	(see appended table 13.3)	P
	No breakdown during the test		P
15	MOISTURE RESISTANCE		---
15.1	Enclosure provides the degree of moisture protection according to classification of appliance (IEC 60 335-1:02)	IPX0	N
15.1.1	Appliance subjected to test as specified	IPX0	N
	Withstand electric strength test specified in 16.3		N
	No trace of water on insulation which can result in a reduction of distances and clearances below values specified in 29.1		N
15.1.2	Hand-held appliance turned continuously through the most unfavourable positions during the test	No hand-held appliance	N
	Built-in appliance installed according to the manufacturer's instruction	No built-in appliance	N
	Other appliances tested as specified	IPX0	N
15.3	Humidity treatment for 48 h		P
	Withstanding the test of Cl. 16		P

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Cl.	Requirement – Test	Result	Verdict
16	LEAKAGE CURRENT AND ELECTRIC STRENGTH		---
16.1	No excessive leakage current and adequate insulation and electric strength (tests 16.2 and 16.3)		P
16.2	Leakage current measurements	(see appended table 16.2)	P
16.3	Electric strength tests (values in table 7)	(see appended table 16.3)	P
17	OVERLOAD PROTECTION OF TRANSFORMERS AND ASSOCIATED CIRCUITS		---
	No excessive temperatures in transformer or associated circuits in event of short-circuits likely to occur in normal use		P
	Appliance supplied with 1,06 or 0,94 times rated voltage and the most unfavourable short-circuit or overload likely to occur in normal use applied	240x1.06=254.4 V S-C	P
	Output terminals of battery charger are short-circuited (IEC 60 335-2-29:04)	Short-circuited	P
	Temperature rise of insulation of the conductors of safety extra-low voltage circuits not exceeding the relevant value specified in table 3 by more than 15 K	No such the conductors of safety extra-low voltage circuits	N
	Temperature of the winding not exceeding the value specified in table 8		P
19	ABNORMAL OPERATION		---
19.1	The risk of fire or mechanical damage under abnormal or careless operation obviated		P
	Electronic circuits so designed and applied that a fault will not render the appliance unsafe		P
19.2	Test of appliance with heating elements with restricted heat dissipation; test voltage (V): power input of 0,85 times rated power input ..... :	No such heating elements	N
19.3	Test of 19.2 repeated; test voltage (V): power input of 1,24 times rated power input ..... :	No such heating elements	N

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Cl.	Requirement – Test	Result	Verdict
19.4	Test conditions as in Cl. 11, the power input being 1,15 times rated power input, any control limiting the temperature during tests of Cl. 11 short-circuited	No controls	N
19.5	Test of 19.4 repeated on Class 0I and I appliances with tubular sheathed or embedded heating elements. No short-circuiting, but one end of the element connected to the elements sheath (IEC 60 335-1:02)	No such heating elements	N
	The test repeated with reversed polarity and the other end of the heating element connected to the sheath	No such heating elements	N
19.6	The working voltage of the PTC heating element is increased by 5% and the appliance is operated until steady conditions are re-established. The voltage is then increased in similar steps until 1,5 times working voltage is reached or until the PTC heating element ruptures	No such PTC heating element	N
19.7	Stalling test by locking the rotor if the locked rotor torque is smaller than the full load torque or locking moving parts (IEC 60 335-1:02)		P
	Locked rotor, motor capacitors open circuited or short-circuited, if required		P
	The test is repeated with the capacitors short-circuited one at a time unless they are of class P2 of IEC 60252		N
	Appliances with timer or controller supplied with rated voltage for each of the tests, for a period equal to the maximum period allowed		N
	Test period at rated voltage (s or min) or until steady state conditions established:		N
	Winding temperatures not exceeding limiting temperature; type of appliance; insulation class; measured temperature (°C):		N
19.8	Three-phase motors operated at rated voltage with one phase disconnected	No such three-phase motors	N

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
19.9	Running overload test of appliance incorporating motors at rated voltage; motor windings insulation class; measured temperature (**错误！未找到引用源。**C); allowed temperature (**错误！未找到引用源。**C) (IEC 60 335-1:02) ..... :	No motors	N
19.10	Series motor operated at 1,3 times rated voltage for 1 min	No such series motor	N
	Parts not ejected from the appliance during test (IEC 60 335-1:02)		N
19.11	Electronic circuits, compliance checked by evaluation of the fault conditions specified in 19.11.2 for all circuits or parts of circuits, unless they comply with the conditions specified in 19.11.1		P
	During and after each test, the temperature of the windings shall not exceed the values specified in table 8.		P
	These limits do not apply to fail-safe transformers complying with subclause 15.5 of IEC 61558-1.		N
	Comply with the conditions specified in 19.13.		P
	Any current flowing through protective impedance not exceeds the limits specified in 8.1.4.	No protective impedance	N
19.11.1	Before applying the fault conditions a) to f) in 19.11.2, it is checked if circuits or parts of circuit meet both of the following conditions:		---
	- the electronic circuit is a low-power circuit, that is, the maximum power at low-power points does not exceed 15 W according to the tests specified		P
	- the protection against electric shock, fire hazard, mechanical hazard or dangerous malfunction in other parts of the appliance does not rely on the correct functioning of the electronic circuit		P
19.11.2	Fault conditions applied one at a time, the appliance operated under conditions specified in Cl. 11, but supplied at rated voltage, the duration of the tests as specified:		---
	a) short-circuit of creepage distances and clearances between live parts of different potential, if these distances are less than the values specified in 29.1, unless the relevant part is adequately encapsulated		P

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
	b) open circuit at the terminals of any component		P
	c) short-circuit of capacitors, unless they comply with IEC 384-14 or 14.2 of IEC 65		P
	d) short-circuit of any two terminals of an electronic component, other than integrated circuits. This fault condition is not applied between the circuits of an optocoupler		P
	e) failure of triacs in the diode mode		P
	f) failure of an integrated circuit. In this case the possible hazardous situations of the appliance are assessed to ensure that safety does not rely on the correct functioning of such a component		P
	During and after each test the following is checked:		---
	- the temperature rise of the windings do not exceed the values specified in table 9	(see appended table 19)	P
	- the appliance complies with the conditions specified in 19.13		P
	- live parts not accessible to the test finger or test pin as specified in Cl. 8		P
	- any current flowing through protective impedance not exceeding the limits specified in 8.14		N
	If a conductor of a printed board becomes open circuited, the appliance is considered to have withstood the particular test, provided all three of the following conditions are met:		---
	- the material of the printed circuit board withstands the burning test of 20.1 of IEC 65		N
	- any loosened conductor does not reduce the creepage distances or clearances between live part and accessible metal parts		N
	- the appliance withstands the tests of 19.11.2 with open circuited conductor bridged		N
19.12	If the safety of the appliance for any of the fault conditions specified in 19.11.2 depends on the operation of a miniature fuse-link complying with IEC 127, the test is repeated, measuring the current flowing through the fuse-link; measured current (A); rated current of the fuse-link (A) .....:		P
19.13	During the tests the appliance does not emit flames, molten metal, poisonous or ignitable gas in hazardous amounts	Comply with requirements	P

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
	Temperature rises not exceeding the values shown in table 9	(see appended table 19)	P
	Enclosures not deformed to such an extent that compliance with Cl. 8 is impaired		P
	Appliance still operable and complying with 20.2		P
	Appliance, other than Class III, withstands the electric strength test of 16.3, however, the test voltage being:		---
	- basic insulation: 1250 V		N
	- supplementary insulation: 1750 V		N
	- reinforced insulation: 3000 V	L/N to output terminal L/N to enclosure with metal foil	P
	During the tests, the values of table 9 apply. (IEC 60335-2-29:04)		P
19.101	Battery chargers supplied at rated voltage and operated under normal operation (controls operating during tests of Cl. 11 being short-circuited) (IEC 60 335-2-29:04)	No controls	N
19.102	Reverse connection of the battery charger to a fully charged battery as specified (IEC 60 335-2-29:04)		P
	Battery charger operated while supplied at rated voltage (IEC 60 335-2-29:04)		P
19.103	Battery chargers in combination with a d.c. distribution board supplied at rated voltage and operated under normal operation until steady conditions are established (IEC 60 335-2-29:04)	No combination with a d.c. distribution board	N
	Load increased as specified until protective device operates (IEC 60 335-2-29:04)		N

20	STABILITY AND MECHANICAL HAZARDS		---
20.1	Adequate stability		P
	Tilting test through an angle of 10° (appliance placed on an inclined plane/horizontal plane); appliance does not overturn		P
	Tilting test repeated on appliances with heating elements, angle of inclination increased to 15**错误！未找到引用源。**	No heating elements	N

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
	Possible heating test in overturned position; temperature rise does not exceed values shown in table 9.		N
20.2	Moving parts adequately arranged or enclosed as to provide protection against personal injury	No move parts	N
	Protective enclosures, guards and similar parts are non-detachable		P
	Adequate mechanical strength and fixing of protective enclosures	Via the screw to fix enclosure	P
	Self-resetting thermal cut-outs and overcurrent protective devices not causing a hazard, if unexpectedly reclosed	No such devices	N
	Not possible to touch dangerous moving parts with test finger		N

21	MECHANICAL STRENGTH		---
	Appliance has adequate mechanical strength and is constructed as to withstand rough handling	Comply with requirements	P
	No damage after three blows applied to various parts of the enclosure, impact energy 0,1 ± 0,05 J (IEC 60335-2-29:04)	0.1J, three blows, no hazards	P
	If necessary, supplementary or reinforced insulation subjected to the electric strength test of 16.3	After testing, no breakdown	P
	If necessary, repetition of groups of three blows on a new sample	Not require to conduct the test	N
21.101	Battery chargers, other than built-in battery chargers, having a mass not exceeding 5 kg subjected to fall test as specified (IEC 60 335-2-29:04)		P
	No damage of the battery charger which could impair compliance with 8.1, 15.1.1, 16.3 and 29.1 (IEC 60 335-2-29:04)		P
21.102	Battery chargers for installing in caravans subjected to vibration test as specified (IEC 60 335-2-29:04)	Not installs in caravans	N
	No damage which could impair compliance with 8.1, 15.1.1, 16.3 and 29.1 (IEC 60 335-2-29:04)		N

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Cl.	Requirement – Test	Result	Verdict
	Connections have not worked loose (IEC 60 335-2-29:04)		N
22	CONSTRUCTION		---
22.1	Appliance marked with the first numeral of the IP system: relevant requirements of IEC 529 are fulfilled	IPX0	N
22.2	Stationary appliance: means to provide all-pole disconnection from the supply provided, the following means being available:		---
	- a supply cord fitted with a plug	Portable appliances	N
	- a switch complying with 24.3		N
	- a statement in the instruction sheet that a disconnection incorporated in the fixed wiring is to be provided		N
	- an appliance coupler		N
	Single-phase Class I appliance with heating elements, intended to be permanently connected to fixed wiring, incorporating single-pole switches or single-pole protective devices for the disconnection of the heating element(s): the switches/devices being connected in the phase conductor (IEC 60 335-1:02)	No heating elements	N
22.3	Appliance provided with pins: no undue strain on socket-outlets		N
	Applied torque not exceeding 0,25 Nm		N
22.4	Appliance for heating liquids and appliance causing undue vibration not provided with pins for insertion into socket-outlets	No such construction	N
22.5	No risk of electric shock when touching the pins of the plug		P
22.6	Electrical insulation cannot be affected by water.	No such construction	N
	The electrical insulation of class II and class II constructions shall not be affected if a hose ruptures or a seal leaks.	No such hose	N
22.7	Appliances containing liquid or gases in normal use shall be against the risk of excessive pressure	No excessive pressure	N
22.8	Electrical connections not subject to pulling during cleaning of compartments to which access can be gained without the aid of a tool, and which are likely to be cleaned in normal use	No such compartments	N

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
22.9	Insulation, internal wiring, windings, commutators and slip rings not exposed to oil, grease or similar substances		P
	Adequate insulating properties of oil or grease to which insulation is exposed	No such parts	N
22.10	Location or protection of reset buttons of non-self-resetting controls is so that accidental resetting is unlikely	No such reset button	N
22.11	Reliable fixing of non-detachable parts which provide the necessary degree of protection against electric shock, moisture or contact with moving parts	No constructions	N
	Obvious locked position of snap-in devices used for fixing such parts	No snap-in devices	N
	No deterioration of the fixing properties of snap-in devices used in parts which are likely to be removed during installation or servicing		N
	Tests		N
22.12	Handles, knobs etc. fixed in a reliable manner	No such constructions	N
	Fixing in wrong position of handles, knobs etc. indicating position of switches or similar components not possible		N
	Axial force 15 N applied to parts, the shape of which being so that an axial pull is unlikely to be applied		N
	Axial force 30 N applied to parts, the shape of which being so that an axial pull is likely to be applied		N
22.13	Unlikely that handles, when gripped as in normal use, make the operators hand touch parts having a temperature rise exceeding the value specified for handles which are held for short periods only	The temperature of enclosure, 40 °C.	P
22.14	No ragged or sharp edges creating a hazard for the user in normal use, or during user maintenance	No such hazards	P
	No exposed pointed ends of self tapping screws etc., liable to be touched by the user in normal use or during user maintenance	No exposed pointed ends of self tapping screws for fixed enclosures	P
22.15	Storage hooks and the like for flexible cords smooth and well rounded	No such device	N

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
22.16	Automatic cord reels cause no undue abrasion or damage to the sheath of the flexible cord, no breakage of conductors strands, no undue wear of contacts	No such device	N
	Cord reel tested with 6000 operations, as specified		N
	Electric strength test of 16.3, voltage of 1000 V applied		N
22.17	Spacers not removable from the outside by hand or by means of a screwdriver or a spanner	No such construction	N
22.18	Current-carrying parts and other metal parts resistant to corrosion under normal conditions of use		P
22.19	Driving belts not used as electrical insulation		N
22.20	Direct contact between live parts and thermal insulation effectively prevented, unless material used is non-corrosive, non-hygroscopic and non-combustible	No thermal insulation	N
22.21	Wood, cotton, silk, ordinary paper and fibrous or hygroscopic material not used as insulation, unless impregnated		P
22.22	Asbestos not used in the construction of the appliance	No asbestos	P
22.23	Oils containing polychlorinated biphenyl (PCB) not used		P
22.24	Bare heating elements adequately supported	No such bare heating elements	N
	In case of rupture, the heating conductor is unlikely to come in contact with earthed metal parts or accessible metal parts		N
22.25	Sagging heating conductors cannot come into contact with accessible metal parts	No such parts	N
22.26	Output circuit supplied through a safety isolating transformer (IEC 60 335-2-29:04)	High-frequency	N
	No connection between output circuit and other accessible metal parts or an earthing terminal (IEC 60 335-2-29:04)		N

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
	Insulation between parts operating at safety extra-low voltage and live parts shall comply with the requirements for double or reinforced insulation (IEC 60 335-2-29:04)		N
22.27	Parts connected by protective impedance separated by double or reinforced insulation	No such protective impedance	N
22.28	Metal parts of Class II appliances conductively connected to gas pipes or in contact with water: separated from live parts by double or reinforced insulation	No such metal parts	N
22.29	Class II appliances permanently connected to fixed wiring so constructed that the required degree of protection against electric shock is maintained after installation	No constructions	N
22.30	Parts serving as supplementary or reinforced insulation fixed so that they cannot be removed without being seriously damaged, or		P
	so constructed that they cannot be replaced in an incorrect position, and so that if they are omitted, the appliance is rendered inoperable or manifestly incomplete		P
22.31	Creepage distances and clearances over supplementary and reinforced insulation not reduced below values specified in 29.1 as a result of wear		P
	Creepage distances and clearances over supplementary or reinforced insulation not reduced to less than 50% of values specified in 29.1 if wires, screws etc. becomes loose		P
22.32	Supplementary and reinforced insulation designed or protected against deposition of dirt or dust		P
	Ceramic material not tightly sintered, similar material or beads alone not used as supplementary or reinforced insulation (IEC 60 335-1:02)		P
	Supplementary insulation of natural or synthetic rubber resistant to ageing, or arranged and dimensioned so that creepage distances are not reduced below values specified in 29.1	No such device	N
	Oxygen bomb test at 70 °C for 96 h and 16 h at room temperature		N

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
22.33	Conductive liquids which are or may become accessible in normal use are not in direct contact with live parts	No such conductive liquids	N
	Electrodes not used for heating liquids		N
	Conductive liquids are not in direct contact with basic insulation or reinforced insulation in Class II constructions		N
	Conductive liquids in direct contact with live parts shall not be in contact with reinforced insulation for Class II constructions		N
22.34	Shafts of operating knobs, handles, levers etc. not live, unless the shaft is not accessible when the part is removed	No such shafts	N
22.35	Handles, levers and knobs, held or actuated in normal use, not becoming live in the event of an insulation fault	No such devices	N
	Such parts being of metal, and their shafts or fixings are likely to become live in the event of an insulation fault, they are either adequately covered by insulation material, or their accessible parts are separated from their shafts or fixings by supplementary insulation		N
	This requirement does not apply to handles, levers and knobs on stationary appliances other than those of electrical components, provided they are either reliably connected to an earthing terminal or earthing contact, or separated from live parts by earthed metal		N
22.36	Handles continuously held in the hand in normal use are so constructed that when gripped as in normal use, the operators hand is not likely to touch metal parts, unless they are separated from live parts by double or reinforced insulation	No hand-held appliance	N
22.37	Capacitors in Class II appliances not connected to accessible metal parts, unless complying with 22.42	No capacitors	N
	Metal casings of capacitors in Class II appliances separated from accessible metal parts by supplementary insulation, unless complying with 22.42		N

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
22.38	Capacitors not connected between the contacts of a thermal cut-out		N
22.39	Lampholders only used for the connection of lamps	No lampholder	N
22.40	Motor-operated appliances and combined appliances, intended to be moved while in operation or which have accessible moving parts, are fitted with a switch to control the motor (IEC 60 335-1:02)	No motors	N
	The actuating member of this switch easily visible and accessible (IEC 60 335-1:02)		N
22.41	Mercury switches mounted according to the requirement	No such switches	N
22.42	Protective impedance consisting of at least two separate components	No such protective impedance	N
	Values specified in 8.1.4 not exceeded if any one of the components is short-circuited or open circuited		N
22.43	Appliances adjustable for different voltages, accidental changing of the setting of the voltage unlikely to occur	No such device	N
22.44	Appliance enclosure not shaped and decorated so that the appliance is likely to be treated as a toy by children (IEC 60 335-1:02)		P
22.101	Colouring of conductors for connection to the terminals of the battery (IEC 60 335-2-29:04)	Not need	N
22.102	Each circuit supplied from a d.c. distribution board incorporates an overload protective device (IEC 60 335-2-29:04)	No d.c. distribution board	N
22.103	Battery chargers for installing in caravans can be securely fixed to a support (IEC 60 335-2-29:04)	No need install in caravans	N

23	INTERNAL WIRING		---
23.1	Wireways smooth and free from sharp edges		P
	Wires protected against contact with burrs, cooling fins etc.		P
	Wire holes in metal well rounded or provided with bushings	No metal hole for internal wire	N

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
	Wiring effectively prevented from coming into contact with moving parts	No move parts	N
23.2	Beads etc. on live wires cannot change their position, and are not resting on sharp edges or corners	No such materials	N
	Beads inside flexible metal conduits contained within an insulating sleeve		N
23.3	Electrical connections and internal conductors movable relatively to each other not exposed to undue stress		N
	Flexible metallic tubes not causing damage to insulation of conductors	No flexible metallic tubes	N
	Open-coil springs not used		P
	Adequate insulating lining provided inside a coiled spring, the turns of which touch one another		N
	No damage after 10 000 flexings		N
	Electric strength test, 1000 V between live parts and metal parts		N
23.4	Bare internal wiring sufficiently rigid and fixed	No such bare internal wire	N
23.5	The basic insulation of internal wiring withstanding the electrical stress likely to occur in normal use (IEC 60 335-1:02)		P
	No breakdown when a voltage of 2000 V is applied for 15 min between the conductor and metal foil wrapped around the insulation		P
23.6	Sleeving used as supplementary insulation on internal wiring retained in position by positive means	No sleeving	N
23.7	Only the colour combination green/yellow used for earthing conductors		P
23.8	Aluminium wires not used for internal wiring		P
23.9	No lead-tin soldering of stranded conductors where they are subject to contact pressure, unless		N
	clamping means so constructed that there is no risk of bad contact due to cold flow of the solder		N

24	COMPONENTS		---
24.1	Components comply with safety requirements in relevant IEC standards (IEC 60 335-1: 02)	See table 24.1	P

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
24.1.1	Capacitors likely to be subjected to the supply mains voltage and used for radio interference suppression or voltage dividing, comply with Annex ZC (IEC 60 335-1:02)		P
24.1.2	Isolating transformers and safety isolating transformers comply with IEC 61558-2-6		N
	Safety isolating transformers tested with the appliance comply with Annex G (IEC 60 335-1:02)		N
24.1.3	For switches, the test of 17.2.7 of IEC 61058-1 carried out for 10 000 cycles of operation (IEC 60 335-1:02)		P
24.1.4	Automatic controls complying with IEC 730: additional tests according to this standard and 11.3.5 to 11.3.8 and Cl. 17 of IEC 730 as type 1 controls, the cycles of operation being:		---
	- thermostats: 10 000		N
	- temperature limiters: 1000		N
	- energy regulators: 3000 (IEC 60 335-1:02)		N
	- timers: 10 000 (IEC 60 335-1:02)		N
24.1.5	Appliance couplers for IPx0 appliances: compliance with IEC 320	IPX0	N
24.1.6	Small lampholders: compliance with requirements for E10 lampholders	No such lamp	N
24.2	No switches or automatic controls in flexible cords		P
	No devices causing the protective device in the fixed wiring to operate in the event of a fault in the appliance		P
	No thermal cut-outs which can be reset by soldering		P
24.3	Switch intended for all-pole disconnection of stationary appliances is directly connected to the supply terminals, having a contact separation of at least 3 mm in each pole		P
24.4	Plugs and socket-outlets for heating elements and extra-low voltage circuits, not interchangeable with plugs, and	Not for heating elements	N

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
	socket-outlets or with connectors and appliance inlets complying with IEC 83 or IEC 320, respectively		N
24.5	Capacitors in auxiliary windings of motor shall be marked with their rated voltages and capacitance and shall be used in accordance with these markings.		N
	30.2.3 is applicable for capacitors, permanently connected in series with a motor winding shall be of class P1 or P2 OF IEC 60252		N
	The voltage across the capacitor does not exceed 1.1 times its rated voltage, when the appliance is supplied at 1.1 times rated voltage and under min. load.		N
	The requirement applies to socket-outlets in the output circuit. (IEC 60335-2-29:04)		P
24.6	Motors connected to the supply mains and having inadequate basic insulation for the rated voltage of the appliance, comply with the requirements of Annex I	No motor	N
	The components are listed on an appended table	See appended table 24	P

25	SUPPLY CONNECTION AND EXTERNAL FLEXIBLE CORDS		---
25.1	Appliance not intended for permanent connection to fixed wiring, means for connection to the supply:		---
	- supply cord fitted with a plug		P
	- an appliance inlet having at least the same degree of protection against moisture as required for the appliance		P
	- pins for insertion into socket-outlets		N
25.2	Appliance not provided with more than one means of connection to the supply		P

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
	Stationary appliance for multiple supply may be provided with more than one means of connection, provided electric strength test of 1250 V for 1 min between each means of connection causes no breakdown	Portable appliances	N
25.3	Connection of supply wires for appliance intended to be permanently connected to fixed wiring possible after the appliance has been fixed to its support	No such constructions	N
	Appliance provided with a set of terminals for the connection of cables or fixed wiring, cross-sectional areas specified in 26.2		N
	Appliance provided with a set of terminals allowing the connection of a flexible cord		N
	Appliance provided with a set of terminals and cable entries, conduit entries, knock-outs or glands, allowing connection of appropriate type of cable or conduit		N
25.4	Cable and conduit entries, rated current of appliance not exceeding 16 A, dimensions according to table 10 (IEC 60 335-1:02)	No such constructions	N
	Introduction of conduit or cable does not affect the protection against electric shock or reduce creepage distances and clearances below values specified in 29.1		N
25.5	Method for assemble supply cord with the appliance:		---
	- type X attachment		N
	- type Y attachment	Type Y attachment	P
	- type Z attachment, if allowed in part 2		N
	Type X attachment: specially prepared cord		N
	Type X attachment not used for flat twin tinsel cord		N
25.6	Plugs fitted with only one flexible cord		P

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
	Supply cords of single-phase portable appliances having a rated current not exceeding 16 A, provided with a plug complying with the following Standard Sheets of IEC 83 (IEC 60 335-1:02):		---
	- for Class I appliances: Standard Sheet C2b, C3b or C4 (IEC 60 335-1:02)		P
	- for Class II appliances: Standard Sheet C5 or C6 (IEC 60 335-1:02)		N
25.7	Appliance supply cord not lighter than:		---
	- braided cord (245 IEC 51)		N
	- ordinary tough rubber sheathed cord (245 IEC 53)		N
	- ordinary polychloroprene sheathed flexible cord (245 IEC 57) (IEC 60 335-1:02)		N
	- flat twin tinsel cord (227 IEC 41)		N
	- light polyvinyl chloride sheathed cord (227 IEC 52), appliance not exceeding 3 kg		P
	- ordinary polyvinyl chloride sheathed cord (227 IEC 53), appliance exceeding 3 kg (IEC 60 335-1:02)		N
	High flexibility are used, they shall not be lighter than		---
	- rubber insulated and sheathed cord (60245 IEC 86)		N
	- rubber insulated, crosslinked PVC sheathed cord (60245 IEC87)		N
	- cosslinked PVC insulated and sheathed cord. (60245 IEC88)		N
	Temperature rise of external metal parts exceeding 75 K, PVC cord not used		N
	PVC cord used: appliance so constructed that the supply cord is not likely to touch external metal parts in normal use		N
	PVC supply cord appropriate for higher temperatures, type Y or type Z attachment used		N

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
	Natural rubber cords not allowed for battery chargers for charging automobile batteries. (IEC 60335-2-29:04)		N
25.8	Nominal cross-sectional area of supply cords according to table 11; rated current (A); cross-sectional area (mm²) (IEC 60 335-1:02):		N
25.9	Supply cord not in contact with sharp points or edges		P
25.10	Green/yellow core for earthing purposes in Class I appliance		P
25.11	Conductors of supply cords not consolidated by lead-tin soldering where they are subject to contact pressure, unless		P
	clamping means so constructed that there is no risk of bad contacts due to cold flow of the solder		N
25.12	Moulding the cord to part of the enclosure does not damage the insulation of the supply cord	No such constructions	N
25.13	Inlet opening provided with a bushing, or is so constructed, that there is no risk of damage to the supply cord when introduced		P
	Inlet opening is insulation material		P
	Supply is unsheathed		P
25.14	Supply cords adequately protected against excessive flexing	No such construction	N
	Flexing test; applied force (N); number of flexings:		N
	The test does not result in:		---
	- short-circuit between the conductors		N
	- breakage of more than 10% of the strands of any conductor		N
	- separation of the conductor from its terminal		N
	- loosening of any cord guard		N
	- damage, within the meaning of the standard, to the cord or the cord guard		N

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
	- broken strands piercing the insulation and becoming accessible		N
25.15	Conductors of the supply cord relieved from strain, twisting and abrasion by use of cord anchorages		P
	The cord cannot be pushed into the appliance to such an extent that the cord or internal parts of the appliance can be damaged		P
	Pull and torque test of supply cord, values shown in table 12: pull (N); torque (Nm) (not on automatic cord reel) .....:		P
	Max. 2 mm displacement of the cord, and conductors not moved more than 1 mm in the terminals		P
25.16	Cord anchorages for type X attachments so constructed and located that:		---
	- replacement of the cord is easily possible		N
	- it is clear how the relief from strain and the prevention of twisting are obtained		N
	- they are suitable for different types of cord		N
	- cord cannot touch the clamping screws of cord anchorage if these screws are accessible, unless separated from		N
	- accessible metal parts by supplementary insulation		N
	- the cord is not clamped by a metal screw which bears directly on the cord		N
	- at least one part of the cord anchorage securely fixed to the appliance, unless part of a specially prepared cord		N
	- screws which have to be operated when replacing the cord do not fix any other component, if applicable		N
	- if labyrinths can be bypassed the test of 25.15 is nevertheless withstood		N

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
	- for Class 0, 0I and I appliances: they are of insulating material or are provided with an insulating lining, unless a failure of the insulation of the cord does not make accessible metal parts live		N
	- for Class II appliances: they are of insulating material, or if of metal, they are insulated from accessible metal parts by supplementary insulation		P
25.17	Adequate cord anchorages for type Y and Z attachment		N
25.18	Cord anchorages only accessible with the aid of a tool, or		N
	so constructed that the cord only can be fitted with the aid of a tool		N
25.19	Type X attachment, glands not used as cord anchorage in portable appliances		N
	Tying the cord into a knot or tying the cord with string not used		P
25.20	Conductors of the supply cord for type Y and Z attachment adequately additionally insulated	Type Y attachment	P
25.21	Space for supply cable for fixed wiring or supply cord for type X attachment constructed to permit checking of conductors with respect to correct positioning and connection before fitting any cover, no risk of damage, no contact with accessible metal parts if a conductor becomes loose, etc.	No such constructions	N
	For portable appliances, the uninsulated end of a conductor prevented from any contact with accessible metal parts, unless the end of the cord is such that the conductors are unlikely to slip free		N
25.22	Appliance inlet:		---
	- live parts not accessible during insertion or removal		P
	- connector can be inserted without difficulty		P
	- the appliance is not supported by the connector		P

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
	- is not for cold conditions if temperature rise of external metal parts exceeds 75 K, unless the supply cord is not likely to touch such metal parts		P
25.23	Interconnection cords comply with the requirements for the max. current during the test of cl. 11. not by the rated current of appliance;		N
	Thickness of insulation of the conductor may reduce if voltage of conductor is less than the rated voltage.		N
	If necessary, electric strength test of 16.3		N
25.24	Interconnection cords not detachable without the aid of a tool		N
25.25	The dimensions of pin compatible with the dimensions of the relevant socket-outlet.		P
	Dimensions of the pin and engagement fact are to be in accordance with IEC 60083.		P
26	TERMINALS FOR EXTERNAL CONDUCTORS		---
26.1	The terminals shall only be accessible after the removal of a non-detachable cover.		N
26.2	Appliances with type X attachment and appliances for connection to fixed wiring provided with terminals in which connection is made by means of screws, nuts or equally effective devices		N
	Screws and nuts serve only to clamp supply conductors, except	No such screws and nuts	N
	Internal conductors, if so arranged that they are unlikely to be displaced when fitting the supply conductors		N
	The conductor soldered shall be positioned or fixed, reliance is not placed upon the soldering alone to maintain it in position.		N

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
	Soldering alone used, barriers provided, creepage distances and clearances satisfactory if the conductor becomes free		N
26.3	Terminals for type X attachment and those for connection to fixed wiring so fixed that when tightening or loosening the clamping means:		---
	- the terminal does not loosen		N
	- internal wiring is not subjected to stress		N
	- creepage distances and clearances are not reduced below the values in 29		N
26.4	Terminals for type X attachment, no special preparation of conductors required, and so constructed and placed that conductors prevented from slipping out, except those with a specially prepared cord and those for connection to fixed wiring		N
26.5	Terminals for type X attachment, when a wire of a stranded conductor escapes there is no risk .		N
	Stranded conductor test, 8 mm insulation removed		N
26.6	Terminals for type X attachment and for connection to fixed wiring suitable for connection of conductors with required cross-sectional area according to table 13; rated current (A); nominal cross-sectional area (mm^2):		N
	Terminals only suitable for a specially prepared cord		N
26.7	Terminals for type X attachment accessible after removal of a cover or part of the enclosure		N
26.8	Terminals for the connection to fixed wiring located close to each other, including the earthing terminal		N
26.9	Terminals of the pillar type constructed and located as specified	No pillar type	N
26.10	Terminals with screw clamping and screwless terminals not used for flat twin tinsel cords, unless conductors ends fitted with a device suitable for screw terminals	No such terminals	N

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
	Pull test of 5 N to the connection		N
	Do' not apply to the terminals of output circuit. (IEC 60335-2-29:04)		N
26.11	For type Y and Z attachment: soldered, welded, crimped and similar connections used		N
	For Class II appliances: the conductor so positioned or fixed that reliance is not placed on soldering, welding or crimping alone		N
	For Class II appliances: soldering, welding or crimping alone used, barriers provided, creepage distances and clearances satisfactory if the conductor becomes free		N
27	PROVISION FOR EARTHING		---
27.1	Accessible metal parts of Class 0I and I appliances, permanently and reliably connected to an earthing terminal		N
	Earthing terminals not connected to neutral terminal		N
	Class 0, II and III appliance have no provision for earthing		N
27.2	Screw clamping terminals comply with Cl. 26		N
	Screwless terminals comply with IEC 998-2-2 (IEC 60 335-1:02)		N
	Terminals used for the connection of external equipotential bonding conductors allow connection of conductors of 2,5 to 6 mm^2, and		N
	do not provide earthing continuity between different parts of the appliance		N
	Conductors cannot be loosened without the aid of a tool		N
	Clamping means adequately secured against accidental loosening		N

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
27.3	Earth connection “made before” and “separated after” current-carrying connections		N
	Current-carrying conductors become taut before earthing conductor, if the cord slips out of the cord anchorage		N
27.4	No risk of corrosion resulting from contact between metal of earthing terminal and other metal		N
	Adequate resistance to corrosion of coated or uncoated parts providing earthing continuity, other than parts of a metal frame or enclosure		N
	Parts of steel providing earthing continuity provided at the essential areas with an electroplated coating, thickness at least 5 μm		N
	Adequate protection against rusting of parts of coated or uncoated steel, only intended to provide or transmit contact pressure		N
	In case of aluminium alloys precautions taken to avoid risk of corrosion		N
27.5	Low resistance of connection between earthing terminal and earthed metal parts		N
27.6	In hand-held appliances printed conductors of printed circuit boards not used to provide earthing continuity (IEC 60 335-1:02)	Portable appliances	N
	In other appliances at least two tracks are used with independent soldering points, and		N
	the appliance complies with the requirements of 27.5 for each circuit, and		N
	the material of the printed board complies with IEC 249-2-4 or IEC 249-2-5		N
28	SCREWS AND CONNECTIONS		---
28.1	Fixings and electrical connections withstand mechanical stresses	Comply with requirements	P

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
	Screws not of soft metal liable to creep, such as zinc or aluminium		P
	Diameter of screws of insulating material min. 3 mm	No insulating screws	N
	Screws of insulating material not used for any electrical connection	No insulating screws	N
	Screws transmitting electrical contact only screwing into metal	Only fix the enclosure	N
	Screws not of insulating material if their replacement by a metal screw can impair supplementary or reinforced insulation	No such screws	N
	Type X attachment, screws to be removed for replacement of supply cord, or for users maintenance, not of insulating material if their replacement by a metal screw can impair basic insulation		N
	Screws and nuts transmitting contact pressure subjected to torque test as specified, applying torque as shown in table 14		P
	The test is not carried out on screws and nuts transmitting contact pressure for earthing continuity provided at least two screws or nuts are used (IEC 60 335-1:02)	No such constructions	N
28.2	Contact pressure not transmitted through insulating material liable to shrink or distort, unless shrinkage or distortion compensated		P
	This requirement does not apply to electrical connections in circuits carrying a current not exceeding 0,5 A (IEC 60 335-1:02)		N
28.3	Space-threaded (sheet metal) screws only used for the connection of current-carrying parts if they clamp these parts directly in contact with each other	No such screws	N
	Thread-cutting (self-tapping) screws not used for electrical connection of current-carrying parts, unless generating a full form standard machine screw thread		P

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
	Thread-cutting (self-tapping) screws not used if they are likely to be operated by the user or installer unless the thread is formed by a swaging action	No such screws	N
	Thread-cutting and space-threaded screws used provide earthing continuity:		---
	- it is not necessary to disturb the connection in normal use	No such screws	N
	- two screws used for each connection		N
28.4	Screws and nuts making mechanical connection between different parts of the appliance, and also making electrical connection or providing earthing continuity secured against loosening	No such constructions	N
	Rivets for current-carrying connections subject to torsion secured against loosening	No rivets	N
29	CREEPAGE DISTANCES, CLEARANCES AND DISTANCES THROUGH INSULATION		---
29.1	Creepage distances and clearances not less than specified in table 13 (IEC 60 335-1:02)	See table 29.1	P
	Resonant voltage between the point where a winding and a capacitor are connected together and metal parts separated from live parts by basic insulation only, creepage distances and clearances not less than the values specified for the value of the voltage produced by the resonance (IEC 60 335-1:02)	No such capacitors	N
	Values increased by 4 mm in case of reinforced insulation when resonance voltage	No resonance voltage	N
29.2	Distances through insulation not less than 1,0 mm for supplementary insulation, and 2,0 mm for reinforced insulation	The thickness of enclosure>2 mm	P
29.2.1	Supplementary insulation applied in thin sheet form, other than mica or similar scaly material, consists of at least two layers, each of the layers withstands the electric strength test of 16.3 for supplementary insulation		P

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Cl.	Requirement – Test	Result	Verdict
	Reinforced insulation applied in thin sheet form, other than mica or similar scaly material, consists of at least three layers, and any two of the layers together withstand the electric strength test of 16.3 for reinforced insulation		P
29.2.2	Supplementary or reinforced insulation inaccessible and does not exceed the maximum permissible temperature values		P
	Supplementary or reinforced insulation, after conditioning as specified, withstands the electric strength test as specified in 16.3, both at the oven temperature and room temperature		P
30	RESISTANCE TO HEAT, FIRE AND TRACKING		---
30.1	See Annex H		P
	Relevant external parts of non-metallic material		P
	Parts supporting live parts and parts providing supplementary or reinforced insulation sufficiently resistant to heat		P
	Ball-pressure test with a force of 20 N, diameter of impression not exceeding 2 mm		P
	External parts: at 75 °C	Enclosure	P
	Parts supporting live parts: at 125 °C	Bobbin	P
	Parts providing supplementary or reinforced insulation: temperature (°C) ..... :		N
30.2	Relevant parts of non-metallic material adequately resistant to ignition and spread of fire		N
30.2.1	Possible burning test of relevant parts according to Annex J		N
	Glow-wire test of Annex K made at temperature 550 °C	Enclosure	P
30.2.2	Appliances operated while attended, insulating material glow-wire test is carry out at		---

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
	750 °C, parts connections a current exceeds 0.5 A in normal use		N
	650 °C, for other connections	Bobbin	P
30.2.3	Appliances operated while unattended, possible bad-connection test according to Annex L	No unattended appliances	N
	Glow-wire test of Annex K made at 850 °C (IEC 60 335-1:02)		N
	Possible needle-flame test according to Annex M		N
30.2.4	Parts of non-metallic material within a distance of 50 mm from parts not withstanding the tests of 30.2.2 or 30.2.3, subjected to the needle-flame test of Annex M		N
30.3	Relevant insulating material have adequate resistance to tracking		N
	Tracking test at 175 V according to Annex N		N
	Tracking test at 250 V according to Annex N		N
	No hazard other than fire, tracking test at 175 V according to Annex N, and in addition needle-flame test of surrounding parts according to Annex M		N
	Possible needle-flame test of non-metallic material		N
31	RESISTANCE TO RUSTING		---
	Relevant ferrous parts adequately protected against rusting		P
	For outdoor parts. (IEC 60335-2-29: 04)	Indoor	N
32	RADIATION, TOXICITY AND SIMILAR HAZARDS		---
	Appliance does not emit harmful radiation		P
	Appliance does not present a toxic or similar hazard		P

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
A	ANNEX A, NORMATIVE REFERENCES		---
	The annex contains a list of standards which are referred to, and thus become part of, this standard		P
B	ANNEX B, TESTING OF APPLIANCES POWERED BY RECHARGEABLE BATTERIES (IEC 335-1:01)		---
B.2	Definitions		N
B.2.2.9	Appliances operated under the following conditions:		---
	- the appliance supplied by its fully charged battery is operated as specified in part 2		N
	- the appliance is charged, the battery being initially discharged to such an extent that the appliance cannot operate		N
	- if possible, the appliance is supplied from the supply mains through its battery charger, the battery being initially discharged to such an extent that the appliance cannot operate. The appliance is operated as specified in part 2		N
B.2.7.2	If a part has to be removed in order to discard the battery before scrapping the appliance, this part is not considered to be detachable even if the instructions state that it is to be removed		N
B.4	General conditions for the tests		---
B.4.101	Unless otherwise specified, appliances supplied from the supply mains are tested as specified for motor-operated appliances		N
B.7	Marking and instructions		---
B.7.1	Battery compartment for batteries intended to be replaced by the user, marked with battery voltage and polarity of the terminals		N
B.7.12	The instructions for appliances incorporating batteries intended to be replaced by the user, include required information		N

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Cl.	Requirement – Test	Result	Verdict
	Details given about how to remove batteries containing materials hazardous to the environment		N
	Materials which are hazardous to the environment are mercury, cadmium or lead (IEC 60 335-1:02)		N
B.7.15	Markings placed on the part connected to the supply mains		N
B.8	Protection against access to live parts		---
B.8.2	Basic insulation between live parts and parts accessible during and after removal of the battery		N
B.11	Heating		---
B.11.7	Charging time for the battery		N
B.19	Abnormal operation		N
B.19.101	Charging time at rated voltage		N
B.19.102	Short-circuiting of the battery, fully charged, for appliances having batteries which can be removed without the aid of a tool		N
B.19.103	Appliances having batteries replaceable by the user, supplied at rated voltage under normal operation with the battery removed or in any position allowed by the construction		N
B.21	Mechanical strength		---
B.21.101	Appliances having pins for insertion into socket-outlets, checked according to procedure 2 of IEC 68-2-32		N
	Mass of part not exceeding 250 g, 100 falls		N
	Mass of part exceeding 250 g, 50 falls		N
B.22	Construction		---
B.22.3	Appliances having pins for insertion into socket-outlets are tested as fully assembled as possible		N
B.25	Supply connection and external flexible cords		N

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Cl.	Requirement – Test	Result	Verdict
B.25.13.2	The requirement is not applicable to interconnection cords subjected to safety extra-low voltage		N
B.30	Resistance to heat, fire and tracking		N
B.30.2	For parts connected to the supply mains during the charging period, 30.2.3 applies		N
	For other parts, 30.2.2 applies		N
C	ANNEX C, AGEING TEST ON MOTORS		---
	Test carried out when doubt with regard to the classification of the insulating system of a motor winding	No motor	N
E	ANNEX E, MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES		---
	Methods of measuring creepage distances and clearances, specified in 29.1, indicated in 10 different cases	Comply with requirements	P
F	ANNEX F, MOTORS NOT ISOLATED FROM THE SUPPLY MAINS AND HAVING BASIC INSULATION NOT DESIGNED FOR THE RATED VOLTAGE OF THE APPLIANCE		---
	Motors having a working voltage not exceeding 42 V, not being isolated from the supply mains, and having basic insulation not designed for the rated voltage of the appliance are tested according to this annex	No motor	N
	All clauses of this standard apply, unless otherwise specified in this annex		N
F.8	Protection against accessibility to live parts		N
F.11.8	Temperature rise of the body of the motor, where in contact with insulating material, not exceeding values in table 3 for the relevant insulating material		N
F.16	Leakage current and electric strength		N
F.19	Abnormal operation		N

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
F.19.101	Appliance operated at rated voltage with each of the following defects:		---
	- short-circuit of the terminals of the motor, including any capacitor incorporated in the motor circuit		N
	- open circuit of the supply to the motor		N
	- open circuit of any shunt resistor during operation of the motor		N
F.22	Construction		N
F.22.101	Class I appliance incorporating a motor supplied by a rectifier circuit, the d.c. circuit being insulated from accessible parts of the appliance by double or reinforced insulation		N
G	ANNEX G, CIRCUIT FOR MEASURING LEAKAGE CURRENTS		---
	A suitable circuit for measuring leakage currents is shown		P
H	ANNEX H, SELECTION AND SEQUENCE OF THE TESTS OF CLAUSE 30		---
J	ANNEX J, BURNING TEST		---
	The burning test is made in accordance with IEC 707, and method FH is used		N
	Category FH3 applies, the maximum burning rate being 40 mm/min		N
K	ANNEX K, GLOW-WIRE TEST		---
	The glow-wire test is made in accordance with IEC 695-2-1 (clause numbers between parentheses refer to IEC 695-2-1)		---
(4)	Description of test apparatus: the last paragraph before the note is replaced		P
(5)	Severities: the duration of application of the tip of the glow-wire to the specimen being (30 ± 1) s		P

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
(10)	Observations and measurements: item c) does not apply		P
L	ANNEX L, BAD-CONNECTION TEST WITH HEATERS		---
	The bad-connection test with heaters is made in accordance with IEC 695-2-3 (clause numbers between parentheses refer to IEC 695-2-3)		---
(3)	General description of the test: additions concerning crimped connections	No heaters	N
(4)	Description of test apparatus: replacements of some of the test specifications and the first paragraph of the note		N
(6)	Severities: the duration of application of the test power being (30 ± 1) s		N
(8)	Test procedure: 8.6 replaced		N
(11)	Information to be given in the relevant specification: item h), the first dashed paragraph, does not apply		N
M	ANNEX M, NEEDLE-FLAME TEST		---
	The needle-flame test is made in accordance with IEC 695-2-2 (clause numbers between parentheses refer to IEC 695-2-2)		---
(4)	Description of the apparatus: the sixth paragraph is replaced		N
(5)	Severities: the duration of application of the test flame is (30 ± 1) s		N
(8)	Test procedure: some changes in the test specifications		N
(10)	Evaluation of the test results: addition in the test specification		N
N	ANNEX N, PROOF TRACKING TEST		---
	The proof tracking test is made in accordance with IEC 112 (clause numbers between parentheses refer to IEC 112)		---

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Cl.	Requirement – Test	Result	Verdict
(3)	Test specimen: the last sentence of the first paragraph does not apply		N
(5)	Test apparatus: some changes in the subclauses		N
(6)	Procedure: adjustments of the test specifications		N
P	ANNEX P, SEVERITY OF DUTY CONDITIONS OF INSULATING MATERIAL WITH RESPECT TO THE RISK OF TRACKING		---
	Recognition of different duty conditions with respect to the risk of tracking		N
ZA	ANNEX ZA, SPECIAL NATIONAL CONDITIONS		---
7.12	DENMARK: requirements regarding marking tag of power supply cord and connecting of earthing wire		Not checked
19.5	NORWAY: the test is also applicable to appliances intended to be permanently connected to fixed wiring		Not checked
19.11.2	AUSTRIA: requirements regarding appliances having circuits which under fault conditions may cause earth-leakage currents having a d.c. component exceeding 5 Ma and exceeding 20% of the total earth-leakage		Not checked
22.2	FRANCE, NORWAY: The second paragraph of this subclause dealing with single-phase Class I appliances with heating elements is not applicable due to the supply system		Not checked
25.6	BELGIUM, FRANCE, GREECE, UNITED KINGDOM: plugs according to Standard Sheet C2b not allowed		Not checked
	AUSTRIA, GERMANY, FINLAND, ICELAND, IRELAND, ITALY, LUXEMBOURG, NETHERLANDS, NORWAY, PORTUGAL, SPAIN, SWEDEN, SWITZERLAND, UNITED KINGDOM: plugs according to Standard C3b not allowed		Not checked

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Cl.	Requirement – Test	Result	Verdict
	DENMARK: Supply cords of single-phase portable appliances having a rated current not exceeding 10 A provided with a plug according to the following:		---
	Class I appliances: Section 107-2-DI Standard Sheet DK2-1a		Not checked
	For appliances covered by a Part 2 of IEC 60 335, also plugs in accordance with IEC 83, Standard Sheet C2b, C3b or C4 are allowed		Not checked
	Class II appliances: IEC 83, Standard Sheet C5 or C6		N
	Stationary single-phase appliances, having a rated current not exceeding 10 A, and provided with a plug, the plug is in accordance with the requirements above		Not checked
	Multi-phase appliances and single-phase appliances having a rated current exceeding 10 A, and provided with a plug, the plug is in accordance with the requirements below:		---
	Class I appliances: Section 107-2-D1, Standard Sheet DK6-1a/IEC 60 309-2, Standard Sheet 2-II, 2-IV		N
	Class II appliances: Section 107-2-D1, Standard Sheet DK6-1a/2-II, 2-IV		N
	IRELAND: plug is in accordance with Standard Sheets B1 (15A), B2 and C2b		Not checked
	SPAIN: Appliances having a rated current not exceeding 6 A, provided with a plug complying with UNE 20 315:		---
	for Class I appliances: Figure 7C		Not checked
	for Class II appliances: Figure 15A		N
	Class I appliances having a rated current not exceeding 16 A, provided with a plug complying with Standard UNE 20 315 Figure 7B		N
	SWITZERLAND: supply cords of portable household and similar electrical appliances, rated current not exceeding 10 A, provided with a plug complying with SEV 1011 or IEC 884-1 and one of the following dimension sheets:		---
	SEV 6532-2:1991 plug type 15 3P+N+PE 250/400 V, 10 A		Not checked
	SEV 6532-2:1991 plug type 11 L+N 250 V, 10 A		Not checked

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
	SEV 6532-2:1991 plug type 12 L+N+PE 250 V, 10 A		Not checked
	UNITED KINGDOM: plug according to Standard Sheet B2 or C5 used (refer to Annex ZB)		P
25.7	FINLAND: PVC insulated cords not used for battery chargers for automobile batteries (IEC 60 335-2-29:96)		Not checked
25.8	IRELAND, UNITED KINGDOM: replacement of figures (rated current/cross-sectional area) in the table		P
ZB	ANNEX ZB, A-DEVIATIONS		---
3	SWITZERLAND: information about batteries		Not checked
7.1	ITALY: the voltage is 220 V/380 V		Not checked
	SPAIN: the voltages are 127 V/220 V and 220 V/380 V		Not checked
7.12	IRELAND: information about required label attached to the supply cord, concerning the colour code of the wires		Not checked
22.22	GERMANY: the amount of asbestos in the mass containing asbestos not exceeding 0,1%	No asbestos	P
	FINLAND: certain types of asbestos not used		P
24	SWEDEN: components containing mercury not used		P
25.6	UNITED KINGDOM: regulations concerning plugs to be fitted to domestic appliances		P
ZC	ANNEX ZC, CAPACITORS (IEC 60 335-1:02)		---
	The following clauses and subclauses of IEC 384-14 apply to capacitors likely to be permanently subjected to the supply mains voltage and used for radio interference suppression or for voltage dividing purposes with the following modifications		N

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Cl.	Requirement – Test	Result	Verdict
	SECTION ONE – GENERAL		---
1.5	Terminology		N
1.5.3	Applicable. Class X capacitors tested according to sub-Class X2		N
1.5.4	Applicable		N
1.6	Marking		N
	Items a) and b) are applicable		N
	SECTION THREE – QUALITY ASSESSMENT PROCEDURES		---
3.4.3.2	Tests		N
	Table II is applicable as follows:		---
	- group 0: subclause 4.1, 4.2 and 4.2.5		N
	- group 1A: subclause 4.1.1		N
	- group 2: subclause 4.12		N
	- group 3: subclause 4.13 and 4.14		N
	- group 6: subclause 4.17		N
	- group 7: subclause 4.18		N
	SECTION FOUR – TEST AND MEASUREMENT PROCEDURES		---
4.1	Visual examination and check of dimensions		N
	Applicable		N
4.2	Electrical tests		N
4.2.1	Applicable		N
4.2.5	Applicable		N
4.2.5.2	Only Table IX applicable. Values for test A apply, for capacitors in heating appliances the values for test B or C apply		N
4.12	Applicable, only insulation resistance and voltage proof are checked (see Table XIII)		N

IEC 60335-2-29			
Cl.	Requirement – Test	Result	Verdict
4.13	Applicable, when capacitors are used for voltage dividing purposes, the impulse voltage is applied to the terminals of the appliance		N
4.14	Applicable, together with subclauses 4.14.1, 4.13.1 and 4.14.7		N
4.17	Applicable		N
4.18	Applicable		N
ZD	ANNEX ZD, SAFETY ISOLATING TRANSFORMERS		---
	Safety isolating transformers, tested with the appliance, comply with this standard and the following additional requirements		N
7	Marking and instructions		N
7.1	Marking of transformers for specific use:		---
	- name		N
	- trademark/identification mark of manufacturer or responsible vendor		N
	- model or type reference		N
17	Overload protection of transformers and associated equipment		---
	The temperature limits specified for the windings do not apply to fail-safe transformers		N
	Such transformers comply with 14.5 of IEC 60 742		N
22	Construction		---
22.501	Subclause 8.6 of IEC 60 742 applicable		N
29	Creepage distances, clearances and distances through insulation		N
29.1	The distances specified in Table XV of IEC 60 742, items 1a, 1c and 2 apply		N

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Cl.	Requirement – Test	Result	Verdict
ZE	ANNEX ZE, SWITCHES		---
	Switches tested with the appliance comply with this standard and the following clauses of IEC 1058-1, as modified		---
	- the tests of IEC 1058-1 carried out under the conditions occurring in the appliance, unless		N
	- otherwise specified, the tests are carried out on the switch incorporated in the appliance		N
	- before being tested in the appliance, switches are operated 20 times without load		N
8	Marking and documentation		---
	Switches are not required to be marked except, that incorporated switches shall be marked with the manufacturer's name or trademark and the type reference		N
13	Mechanism		---
	Applicable		N
15	Insulation resistance and electric strength		N
15.1	Not applicable		N
15.2	Not applicable		N
15.3	Applicable for full disconnection micro-disconnection		N
17	Endurance		---
	Applicable, at the end of the tests, temperature rise of the terminals not increased by more than 30 K		N
20	Clearances, creepage distances and distances through insulation		---
	Applicable for creepage distances and clearances for live parts of different potential only, as stated in table 18 for operational insulation, and across full disconnection and micro-disconnection		N
ZF	ANNEX ZF, informative		---
	IEC and CENELEC code designations for flexible cords		Not checked

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Cl.	Requirement – Test	Result	Verdict

10	TABLE: power input and current			P
Rated Voltage and Frequency (V/Hz)	Rated Input Power or Current (W/A)	Tested Voltage and Frequency (V/Hz)	Measured Input Power or Current (W/A)	Measured Power deviation
100-240Vac/50Hz	15W	230V/50Hz	14.5W	-3.33%
Limited deviation: power input deviation: +20%				

11	TABLE: temperature rise measurements		P
	1.06 times rated Voltage		
	254.4Vac 60Hz		
	Ambient (t1) (℃)	Ambient (t2) (℃)	
	25	25	

No.	Temperature rise dT of part/at:	dT (K)	Limited dT (K)
1	Plug	30.7	---
2	Primary winding of transformer	70.1	105
3	Secondary winding of transformer	67.4	105
4	PCB	49.4	80
5	Enclosure, accessible	19.6	60
6	Enclosure, close to transfomer, inside	28.5	--
7	Power cord	13.8	80

13.2	TABLE: leakage current measurements at operating temperature	P
	At 1,06 times maximum rated input (V): 254.4V	—

Leakage current between:	I (mA)	Limited I (mA)
Between live part and enclosure (wrapped with metal foil)	< 0.005	0.25
Between live part and DC terminals	< 0.005	0.25

13.3	TABLE: electric strength measurements at operating temperature:	P

Test voltage applied between:	Test voltage (V)	Breakdown
Between live part and enclosure (wrapped with metal foil)	3000Vac	No

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Cl.	Requirement – Test	Result	Verdict

Between live part and DC output terminals	3000Vac	No
Primary of transformer to secondary of transfomer	3000Vac	No

15.3	**TABLE: Moisture resistance, humidity treatment**	**P**
Temperature (°C)	Humidity (%)	Duration (hours)
25°C	93%	48
Remark: After humidity test, electric strength test specified in clause 16.3 should be applied.		

16.2	**TABLE: leakage current measurements**	**P**
	At 1,06 times rated voltage (V): 254.4V	—
Leakage current I between:	I (mA)	Limited I (mA)
Between live part and enclosure (wrapped with metal foil)	<0.005	0.25
Between live part and DC terminals	<0.005	0.25

16.3	**TABLE: electric strength measurements:**	**P**
Test voltage applied between:	Test voltage (V)	Breakdown
Between live part and enclosure (wrapped with metal foil)	3000Vac	No
Between live part and DC output terminals	3000Vac	No
Primary of transformer to secondary of transformer	3000Vac	No

17	**TABLE: overload of transfomer and associated circuit**		**P**
	ambient temperature (°C)	25°C	—

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Cl.	Requirement – Test	Result	Verdict

No.	location	fault	test voltage (V)	test time	result
1	DC output	S-C	243.8V	2hours	Work normally. The winding temperature: 74.4 °C, limit: 165°C. No hazards.

19	**TABLE: abnormal operation tests**				**P**
	ambient temperature (°C)		25°C		—
No.	component No.	fault	test voltage (V)	test time	result
1	Capacitor	S-C	230	3min	No hazards

24.1	**TABLE: components**				**P**
object/part No.	manufac-turer/trademark	type/model	technical data	standard	mark(s) of conformity

29.1	TABLE: CREEPAGE DISTANCE AND CLEARANCE THROUGH INSULATION MEASUREMENTS					**P**
clearance cl and creepage distance dcr at/of:	Up (V)	U r.m.s. (V)	required cl (mm)	cl (mm)	required dcr (mm)	dcr (mm)
Pri. to sec. of transformer	325	230	3.0	<3.0	5.0	<5.0

30.1	**TABLE: ball-pressure tests for thermoplastics**		**P**
	Limited impression diameter (mm)	≦2 mm	---
Part	Test temperature (°C)	Impression diameter (mm)	
Enclosure	75°C	0.91	
Bobbin of transformer	125°C	0.83	

30.2	**TABLE: glow wire test**	**P**
Part	Test temperature (°C)	Result
Bobbin	650°C	Not burning
Enclosure	550°C	Not burning

ANNEX A:

Photo-documentation

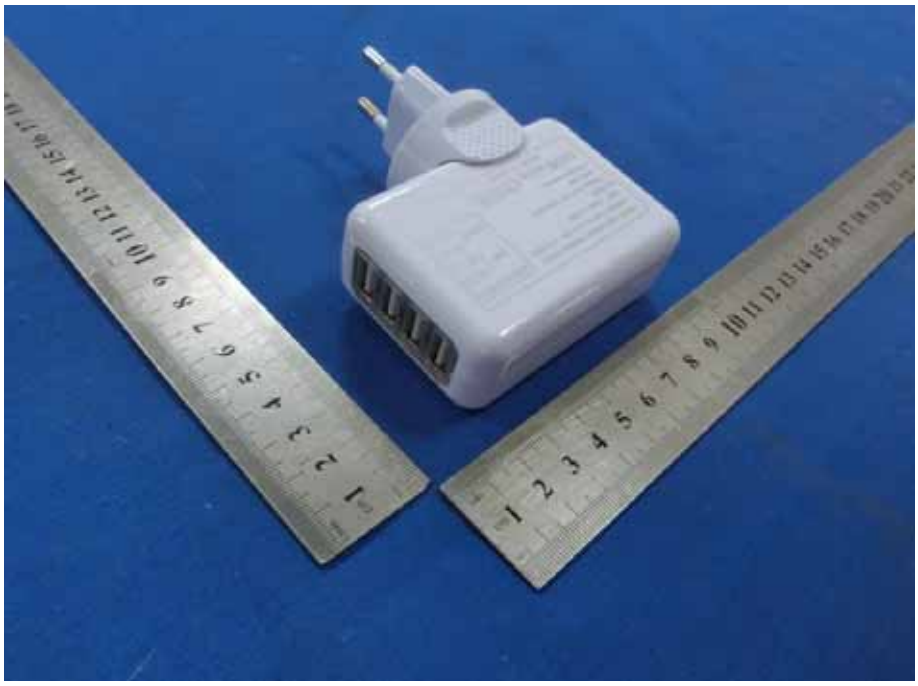

Fig.1 General appearance of EUT

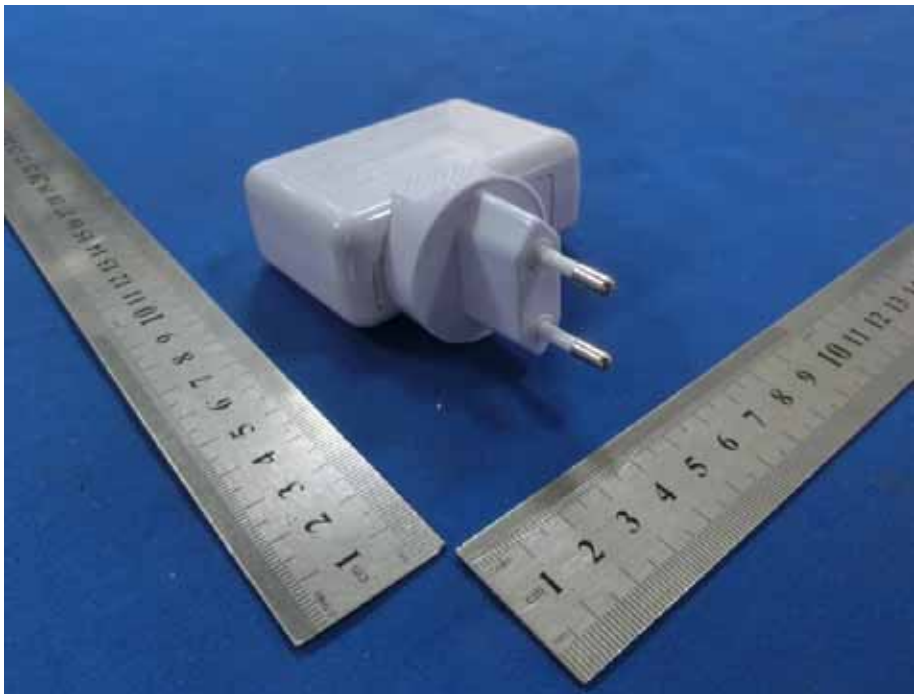

Fig.2 General appearance of EUT

Fig. 3 General appearance of EUT

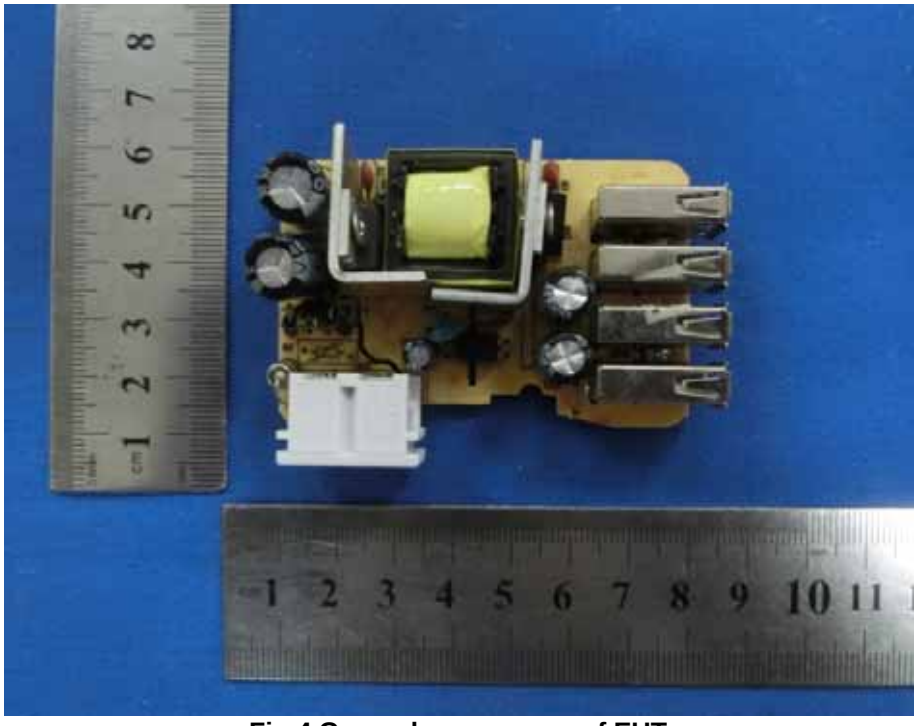

Fig.4 General appearance of EUT

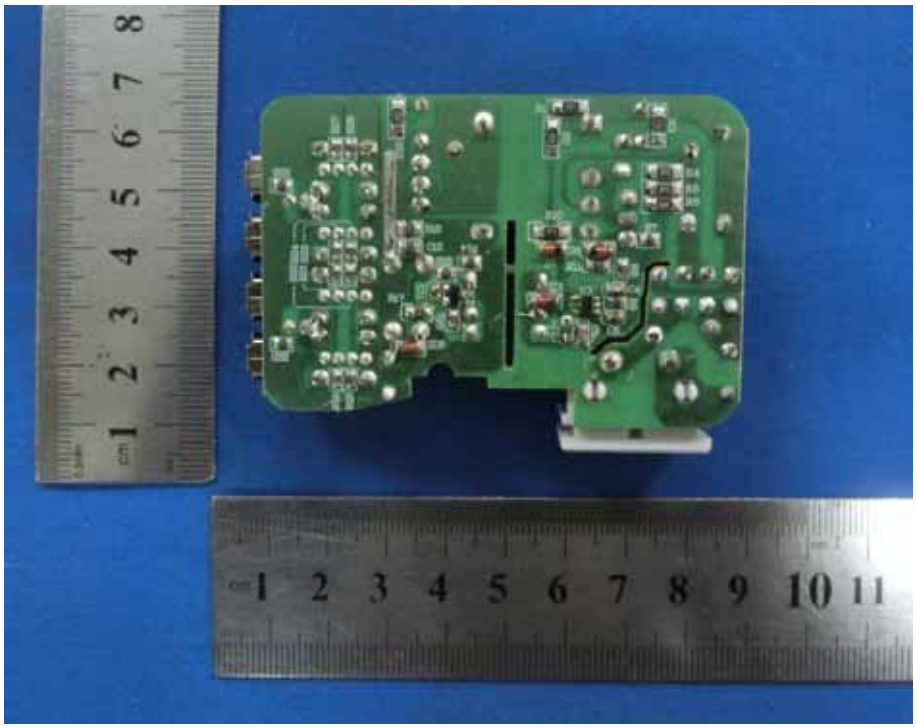

Fig.5 General appearance of EUT

End of the report