

SCHWAIGER GMBH

CE LVD REPORT

Prepared For :	SCHWAIGER GMBH WÜrzburger Straße 17,90579 Langenzenn
Product Name:	HDMSCA01 533
Trade Name:	NA
Main Test Model:	HDMSCA01 533
Additional Model:	N/A
Prepared By :	Shenzhen BST Technology Co., Ltd. Building No.23-24, Zhiheng Industrial Park, Guankouer Road, Nantou, Nanshan District, Shenzhen, Guangdong, China
Test Date:	Feb. 15, 2018 - Feb. 1, 2018
Date of Report :	Mar. 2, 2018
Report No.:	BST18021043950001Y-1SR-2



	TEST Report
	EN60065
Safety req	uirements for Audio, video
and simi	lar electronic apparatus
Testing laboratory	Shenzhen BST Technology Co., Ltd.
Address	Building No.23-24, Zhiheng Industrial Park, Guankouer Road, Nantou,Nanshan District,Shenzhen,Guangdong,China
Testing location	Shenzhen BST Technology Co., Ltd.
Applicant	SCHWAIGER GMBH
Address	WÜrzburger Straße 17,90579 Langenzenn
Standard	EN 60065:2014
Procedure deviation	N.A.
Non-standard test method	N.A.
Type of test object	HDMSCA01 533
Trademark	See Page 1
Model/type reference	See Page 1
Rating:	100-240Vac,50/60Hz,100mA,3W
Manufacturer	SCHWAIGER GMBH
Address	WÜrzburger Straße 17,90579 Langenzenn
Particulars: test item vs. test requirer	nents
Appliance mobility	Fixed appliance
Operating condition	Continuous operation
Class of appliance	Class I
Protection against ingress of water	IPX0
Possible test case verdicts :	
test case does not apply to the test ob	oject : N(.A.)

test object does meet the requirement : P(ass)

test object does not meet the requirement	:	F(ail)



2

Shenzhen BST Technology Co., Ltd.

General remarks:	
"(see remark #)" refers to a remark appended to the	Attached with:
	A. photo documentation
"(see appended table)" refers to a table appended to the report. Throughout this report a point is used as the decimal separator. The test results presented in this report relate only to the object tested.	The series products have the same circuit diagram, PCB layout and functionality. The differences are the model name, All of the test conduct on model: HDMSCA01 533.
This report shall not be reproduced except in full without the written approval of the testing laboratory.	
Artwork of Marking Label:	
HDMSCA01 533	
Model: HDMSCA01 533 Rating:100-240Vac,50/60H	z,100mA,3W
(6分	X
SCHWAIGER GMBH	

Prepared by :	Watt Sun
	Engineer
Reviewer :	Jacky Zhang
Approved & Authorized Signer :	APPROVED S Manager 01



Report No: BST18021043950001Y-1SR-2

3	General requirements		Р
	Safety class of the apparatus	Not directly connected to mains.	Р

4	General test conditions	Р
4.1	Conduct of tests	Р
4.1.1	Tests according to this standard are type tests	Р
4.1.2	The sample or samples under test shall be representative of the apparatus the user would receive.	Р
4.1.3	Unless otherwise specified, the tests are carried out under normal operating conditions at: an ambient temperature between 15 °C at 35 °C a relative humidity of 75% maximum	Ρ
4.1.4	Any position of intended use of the apparatus, normal ventilation not being impeded.	Р
4.1.5	The characteristics of the supply source used during the tests shall not appreciably influence the test results.	Р
4.1.6	Where relevant, a standard signal consisting of PINK NOISE, band-limited by a filter whose response conforms to that given in figure C.1 in annex C.	N
4.1.7	The a.c. values given in this standard are r.m.s values, unless specified otherwise	Р
4.2	Normal operating conditions	Р
4.2.1	The apparatus is connected to a supply voltage of 0.9 times or 1.1 times of any rated supply voltage for which the apparatus is designed.	Р
4.2.2	Any position of controls which are accessible to the user for adjustment by hand	Р
4.2.3	Any earth terminal and any protective earth of single-phase supply may be connected to either pole of the isolated supply source used during the test	N
4.2.4	For an audio amplifier:	Р

Add:Building No.23-24,Zhiheng Industrial Park,Guankouer Road,Nantou,Nanshan District,Shenzhen,Guangdong,China Certificate Search: <u>http://www.bst-lab.com</u>, Tel: 400-882-9628, 8009990305, E-mail:christina@bst-lab.com



Report No: BST18021043950001Y-1SR-2

4.2.5	Load conditions for the motor are chosen which may occur during intended use for	See Table 11.2	P
4.2.6	An apparatus supplying power to other apparatus is loaded to give its rated power or not loaded.		Р
4.2.7	A supply apparatus to be used inside apparatus, for which it is intended exclusively, is tested within such apparatus after installation according to the manufacturer's instruction for use.		N
4.2.8	For citizen's band apparatus, the rated load impedance is connected or not to the antenna terminal.		N
4.2.9	For antenna positioners		N
4.2.9.1	Movements and the resting periods for antenna positioners in combination with their control and supply apparatus.		N
4.2.9.2	The power supply unit shall be loaded in accordance with the marked output rating and operated with a duty cycle of 5 min on, and 15 min off for satellite antenna positioners consisting of a power supply and control unit.		N
4.2.10	Apparatus designed to be supplied exclusively by a special supply apparatus shall be tested together with this special supply apparatus.		Р
4.2.11	Apparatus supplied by supply apparatus for general use shall be supplied by a test power supply according to table 1.		N
4.2.12	Apparatus intended to be used with optional detachable legs or stands are tested with or without legs or stands fitted.		Р
4.3	Fault conditions		Р
4.3.1	Short-circuit across clearances and creepage distances if they are less than the values specified in clause 13 for basic and supplementary insulation.		N
4.3.2	Short-circuit across parts of insulating material		Р
4.3.3	Short-circuit or interruption of :		N
	heaters of electronic tubes		N
	insulation between heaters and cathodes of electronic tubes		N



Report No: BST18021043950001Y-1SR-2

	spacings in electronic tubes, excluding picture tubes	N
	semiconductor devices, one lead at a time interrupted or any two leads connected together in turn.	N
4.3.4	Short-circuit or disconnection of resistors, capacitors, windings, loudspeakers, optocouplers, varistors or non-linear passive components.	Р
4.3.5	For apparatus containing an audio amplifier, using the standard signal to deliver the most unfavourable output power from zero up to the maximum attainable output power to the rated load impedance.	Ρ
4.3.6	Motors are stalled if this is possible.	Ν
4.3.7	Motors, relay coils or the like, intended for short-time or intermittent operation, are operated continuously if this can occur during operation	N
4.3.8	The apparatus is connected simultaneously to alternative types of supply	Р
4.3.9	Output terminals of apparatus supplying power to other apparatus are connected to the most unfavourable load impedance, including short circuit.	Р
4.3.10	Ventilation openings shall be covered.	Ν
4.3.11	The apparatus is tested with one or more batteries with both intended and reversed polarity	N
4.3.12	The most unfavourable load impedance including short circuit is connected to the antenna terminal for citizen's band apparatus.	N
4.3.13	Mains voltage setting device should be set at the most unfavourable position for apparatus provided with a voltage setting devices.	Р
4.3.14	The voltage setting device should be adjusted at any output voltage for apparatus supplied by a special apparatus with a voltage setting devices for the output voltage.	Ν
4.3.15	Apparatus which can be supplied by supply apparatus for general use shall be tested by using a test power supply as specified in table 1 step by step upwards.	N
4.3.16	For apparatus with a charging circuit, recharge a fully discharged special battery with one cell short-circuited.	N



Report No: BST18021043950001Y-1SR-2

5	Marking and instructions		Р
	Comprehensible and easily discernible		Р
	Permanent durability against water and petroleum spirit		Р
	Letter symbols comply with IEC 60027		Р
	Graphical symbols comply with IEC 60417 & and ISO 7000		N
5.1	Identification and supply ratings		Р
	Maker's or responsible vendor's name, trade mark or identification mark	See page 1	Р
	Model number or type reference	See page 1	Р
	Class II symbol if applicable	Class I symbol.	Ν
	Rated supply voltage and symbol	100-240Vac	Р
	Frequency if safety dependant		N
	Rated current or power consumption		Р
5.2	a) Earth terminals		N
b)	Hazardous live terminals		N
c)	Supply output terminals (other than mains)		N
5.3	Use of triangle with exclamation mark	Provided on circuit diagram	Р
5.4	Instructions for use		Р
5.4.1 a)	For main powered apparatus, instruction shall state the apparatus shall not be exposed to dripping or splashing		Р
b)	Hazardous live terminals, instructions for wiring		N
c)	Instructions for replacing lithium battery instruction for modem if fitted.		N
d)	Class I earth connection warning		N



Report No: BST18021043950001Y-1SR-2

e)	Instructions for multimedia system connection	N
,	,	
f)	Special stability warning for fixed installation	N
•,		
5.4.2	Disconnect device: plug/coupler or all-pole	N
••••=		
	mains switch location, accessibility and	
	markings	
	Instructions for permanently connected	N
	appliance	
1		

6	Hazardous radiation	N
6.1	Ionizing radiation	N
	Adequate protection against ionizing radiation	N
	Measure value of ionizing radiation in normal condition	N
	Measure value of ionizing radiation under fault condition	N
6.2	Laser radiation	N
	Protection against laser radiation under normal condition and fault condition	N
	Classification of laser radiation	N
6.2.1	Laser radiation, emission limits to IEC 60825- 1	Ν

7	Heating under normal operating conditions		Р
7.1	Temperature rises not exceeding specified values, no operation of fuse link	See appended table	Р
7.1.1	Temperature rise of accessible parts	See appended table	Р
7.1.2	Temperature rise of parts providing electrical insulation		Р
7.1.3	Temperature rise of parts acting as a support or as a mechanical barrier	See appended table	Р
7.1.4	Temperature rise of windings		N
7.1.5	Temperature rise of parts not subject to a limit under 7.1.1 to 7.1.4 inclusive	See appended table	Р



Report No: BST18021043950001Y-1SR-2

7.2	Softening temperature insulation material	N
	supporting parts conductively connected to the	
	mains carrying a current exceeding 0.2A at	
	least 150 °C	

8	Constructional requirements with regard to t shock	he protection against electric	N
8.1	Conductive parts, covered by lacquer, solvent -based enamel, ordinary paper, untreated textile, oxide films or beads are considered to be bare.		Ν
8.2	No shock hazard when changing voltage setting device, fuse-links or handling drawers etc.		Ν
8.3	Insulation of hazardous live parts not provided by hygroscopic materials.		Ν
8.4	No risk of electric shock following the removal of a cover which can be removed by hand		Ν
8.5	Class I apparatus		Ν
	Basic insulation between hazardous live parts and earthed accessible parts		Ν
	Basic insulation between hazardous live parts and earthed accessible parts		Ν
	Resistors bridging basic insulation complying with 14.2.1 a)		Ν
8.6	Class II appliance and Class II constructions within Class II appliance	Class I	Ν
	Reinforced or double insulation between hazardous live parts and accessible parts		Ν
	Components bridging reinforced or double insulation complying with 14.1 a) or 14.3		Ν
	Basic and supplementary insulation each being bridged by a capacitor complying with 14.2.1 a)		Ν
	Reinforced or double insulation being bridged with 2 capacitors in series complying with 14.2.1 a)		Ν
	Reinforced or double insulation being bridged with a single capacitor complying with 14.2.1 b)		N
8.7	Basic insulation between parts at 35 V to 71 V (peak) a.c. or 60 V to 120 V d.c. and accessible parts		Ν



Report No: BST18021043950001Y-1SR-2

	Reinforced or double insulation between		Ν
	circuits operating at voltages between 35 V		
	and 71 V (peak) a.c. or between 60 V and		
	120 V d.c. and hazardous live parts at higher		
	voltage		
	Separation by Class II isolating transformer		N
	Separation by Class I isolating transformer		N
	Separation by earthed conductive part		N
	opparation by carried conductive part		
8.8	Basic or supplementary insulation ≥0.4mm		N
	Reinforced insulation≥0.4mm		N
	Thin sheet insulation		N
	Basic or supplementary insulation, at least two		N
	layers, each meeting 10.3		
	Basic or supplementary insulation, three		N
	layers any two of which meet 10.3		
	Reinforced insulation two layers each of		N
	which meet 10.3		
-			NI
	Reinforced insulation, three layers any two		N
	which meet 10.3		
8.9	Adequate insulation between internal		N
	hazardous live conductors and accessible		
	parts		
	Adequate insulation between internal		N
	hazardous live parts and conductors		
	connected to accessible parts		
8.10	Double insulation between conductors		N
	connected to the mains and accessible parts		
8.11	Detaching of wires		NI
-			IN
	No unduo reduction of creanage of classes	┥────┤	NI
	distances if wires become detached		IN
	Vibration test carried out		Ν
8.12	Adequate cross-sectional area of internal	† †	Ν
	wiring to mains socket-outlets.		-
0 1 2	Adaquata fastaning of windows, langage, laws	┥────┤	NI
0.13	Adequate fastening of windows, lenses, lamp		IN
	covers etc. (pull test ZUN for TUS)		



Report No: BST18021043950001Y-1SR-2

8.14	Adequate fastening of covers (pull test 50N, for 10 s)	Ν
8.15	No risk of damage to the insulation of internal wiring due to not hot parts or sharp edges	N
8.16	Only special supply appliance can be used	N
8.17	Requirements for insulated winding wires for use without additional interleaved insulation	N
8.18	Endurance test as required by 8.17	N
8.19	Disconnection from the mains	N
8.19.1	Disconnect device	N
	All-pole switch or circuit breaker with >3mm contact separation	N
8.19.2	Mains switch ON indication, main switch is used as a disconnect device.	N
8.20	Switch not fitted in the mains cord	N
8.21	Bridging components comply with clause 14	N

9	Electric shock hazard under normal operatin	g conditions	Ν
9.1	Testing on outside		
9.1.1	For voltage > 1000Vac or > 1500Vac complies with clause 13.3.1 for basic insulation		Ν
9.1.1.1 a)	Determination of hazardous live parts		Ν
b)	Touch current measured from terminal devices using the network in Annex D		Ν
c)	Discharge not exceeding 45 µC		
d)	Energy of discharge not exceeding 350 mJ		
9.1.1.2	Test with test finger and test probe		Ν
9.1.2	No hazardous live shafts of knobs, handlers or levers		Ν



Report No: BST18021043950001Y-1SR-2

9.1.3	Ventilation holes tested by means of 4 mm x 100 mm test pin		Ν
9.1.4	Terminal devices tested with 1 mm x 20 mm test pin (10 N); test probe D of IEC 61 032		N
9.1.5	Pre-set controls tested with 2 mm x 100 mm test pin (10 N); test probe C of IEC 61 032		N
9.1.6	No shock hazard due to stored charge on withdrawal of the mains plug; voltage (V) after 2 s		N
	If C is not greater than 0.1 µF no test needed		N
9.1.7	Enclosure sufficiently resistant to external force		N
	Test probe 11 of IEC 61 032 for 10 s (50N)	50 N for 10s applied	Ν
	Test hook of fig.4 for 10s (20N)	20 N force directed outwards, is applied for 10s at all points where this is possible, no hazard	Ν
	30 mm diameter test tool for 5 s (100 or 250N)		N
9.2	No hazard after removing a cover by hand		Ν

10	Insulation requirements	N
10.1	Insulation resistance (M Ω) at least 2 M Ω min. after surge test basic and 4 M Ω mi. for reinforced insulation:	N
10.2	Humidity treatment 48 h of 120 h	N
10.3.1	Insulation material of live parts be adequate to resistant to electric shock	N
10.3.2	The insulation listed in table 5 shall be tested for insulation resistance and for dielectric strength.	Ν

11	Fault conditions	Р
11.1	No shock hazard under fault conditions	Р
11.2	Heating under fault condition See below.	Р



Shenzhen BST Technology Co., Ltd.

Report No: BST18021043950001Y-1SR-2

	No hazard from softening solder	No such flames	Р
	No flaming more than 10s	No solder point became soft.	P
	Soldered terminations not used as protective mechanism		Р
11.2.1	Measurement of temperature rises	See appended table	Р
11.2.2	Temperature rise of accessible parts	See appended table	Р
11.2.3	Temperature rise of parts, other than windings, providing electrical insulation.	See appended table	Р
	Temperature rise of printed circuit boards (PCB) exceeding the limits of Table 3 by max. 100 K for max. 5 min		N
	a) Temperature rise of printed circuit boards (PCB) to 20.3.1, exceeding the limits of Table 3 by not more than 100 K for an area not greater than 2 cm ²		N
	b) Temperature rise of printed circuit boards (PCB) to 20.3.1 up to 300 K for an area not greater than 2 cm ² for a maximum of 5 min		N
	Meets all the special conditions if conductors on printed circuit boards are interrupted		N
	Class I protective earthing maintained		N
11.2.4	Temperature rise of parts acting as a support or a mechanical barrier		N
11.2.5	Temperature rise of windings		N
11.2.6	Temperature rise of other parts not subject to the limits of 11.2.1 to 11.2.5		Р

12	Mechanical strength		Р
12.1.1	Bump test for apparatus with a mass exceeding 7Kg	Approx. 0.915kg	N
12.1.2	Vibration test		Р
12.1.3	Impact hammer test	0.5J, 3 times applied on enclsure, After test no hazard.	Р
	Steel ball test	0.2J, 1 times applied on enclsure, After test no hazard.	Р



Report No: BST18021043950001Y-1SR-2

12.1.4	Drop test for portable apparatus having where mass < 7 kg		N
12.1.5	Thermoplastic enclosures stress relief test	70°C, 7hours, After test no hazard.	Р
12.2	Fixing of knobs, push buttons, keys and levers		Р
12.3	Remote controls with hazardous live parts	No live part.	N
12.4	Drawers (pull test 50 N, 10 s)		N
12.5	Antenna coaxial sockets providing isolation		N
12.6	Telescoping or rod antennas construction		N
12.6.1	Telescoping or rod antennas securement		Р

13	Clearances and creepage distances	N
13.1	Clearances in accordance with 13.3	N
	Creepage distances in accordance with 13.4	N
13.2	Determination of operating voltage	N
13.3	Clearance	N
13.3.2	Circuits conductively connected to the mains comply with table 8 and, where applicable, table 9	N
13.3.3	Circuits not conductively connected to the main comply with table 10	N
13.4	Creepage distances	N
	Creepge distances greater than table 11 minima	N
13.5	Printed boards	N
13.5.1	clearances and creepage distances between conductors on printed circuit boards, one of which may be conductively connected to the mains, as in fig. 10	N
13.5.2	Type B coated printed circuit boards complying with IEC 60664-3 (basic insulation only)	N



Report No: BST18021043950001Y-1SR-2

13.6	Conductive parts along uncemented joints clearances and creepage distances comply with 13.3/13.4	N
	Conductive parts along reliably cemented joints comply with 8.8	N
13.7	Enclosed, enveloped or hermitically sealed parts: clearances and creepage distances to table 12	N
13.8	Parts filled with insulating compound, meeting the requirements of 8.8	N

14	Components		Р
14.1	Resistors	approved	Р
	a) Resistors between hazardous live parts and accessible metal parts		N
	b) Resistors, other than between hazardous live parts and accessible parts		N
	b) Resistors separately approved		N
14.2	Capacitors and RC-units		N
	Capacitors separately approved		
14.2.1	Y Capacitors tested to IEC 60384-14, 2nd edition		N
14.2.2	X Capacitors tested to IEC 60384-14, 2nd edition		N
14.2.3	Capacitors operating at mains frequency but not connected to the mains: tests for X2		N
14.2.5	Capacitors with volume exceeding 1750 mm ³ , where short-circuit current exceeds 0,2 A: compliance with IEC60384-1, 4.38 category B or better		N
	Capacitors with volume exceeding 1750 mm ³ , mounted closer to a potential ignition source than table 5 permits: compliance with IEC 60 384-1, 4.38 category B or better		N
	Shielded by a barrier to FV 0 or metal		N
14.3	Inductors and windings		N



Report No: BST18021043950001Y-1SR-2

	Comply with IEC 61558-1, IEC 61558-2 (as relevant) and clause 20.1.4	Ν
14.3.1	Transformers and inductors marked with manufacturer's name and type	Ν
	Transformers and inductors separately approved	Ν
14.3.2	General	N
14.3.3	Constructional requirements	
14.3.3.1	Clearances and creepage distances of all windings shall comply with the requirement of clause 13	Ν
14.3.3.2	Transformer meet the constructional requirements	Ν
14.3.4.1	Class II transformers have adequate separation between hazardous live parts and accessible parts (double or reinforced insulation)	Ν
	Coil former and partition walls > 0,4mm	Ν
14.3.4.2	Class I transformers, with basic insulation and protective screening only if all 7 condition of 14.3.4.2	N
14.3.4.3	Separating transformers with at least basic insulation	N
14.3.5.1	Class II transformers have adequate insulation between hazardous live parts and accessible parts (double or reinforced insulation)	Ν
	Coil formers and partition walls > 0,4mm	Ν
14.3.5.2	Class I transformers have adequate insulation between hazardous live parts and accessible conductive parts or those conductive parts or protective screens connected to a protective earth terminal	N
	Winding wires connected to protective earth have adequate current-carrying capacity	Ν
14.4	High voltage components	Ν
	High-voltage components and assemblies: U > 4 kV (peak) separately approved	Ν
	Component meets category V -1 of IEC 60 707	Ν



Report No: BST18021043950001Y-1SR-2

14.4.1	High voltage transformers and multipliers tested as part of the submission	Ν
14.4.2	High voltage assemblies and other parts tested as part of the submission	N
14.5	Protective devices	N
	Protective devices used within their ratings	Ν
	External clearance and creepage distances meet requirement of clause 13 for the voltage across the device when opened	N
14.5.1.1	a) Thermal cut-outs separately approved	Ν
	b) Thermal cut-outs tested as part of the submission	N
14.5.1.2	a) Thermal links separately approved	Ν
	b) Thermal links tested as part of the submission	N
14.5.1.3	Thermal devices re-setable by soldering	N
14.5.2.1	Fuse-links in the mains circuit according to IEC 60 127	N
14.5.2.2	Correct marking of fuse-links adjacent to holder	N
14.5.2.3	Not possible to connect fuses in parallel	Ν
14.5.2.4	Not possible to touch hazardous live parts when replacing fuse-links without the use of a tool	N
14.5.3	PTC-S thermistors comply with IEC 60 730-1	Ν
	PTC-S devices (15 W) category FV 1 or better	N
14.5.4	Circuit protectors have adequate breaking capacity and their position is correctly marked	Ν
14.6	Switches	N
14.6.1 a)	Separate testing to IEC 61058 including: 10000 operations Normal pollution suitability Resistance to heat and fire level 3 and V-0 compliance with annex G, G.1.1	Ν



Report No: BST18021043950001Y-1SR-2

14.6.1 b)	Tested in the apparatus:	N
,	Switch controlling > 0.2A with open contact voltage > 35 V (peak)/24 V dc complying with 14.6.3, 14.6.4 and V-0 in annex G, G.1.1	N
	Switch controlling > 0.2A with open contact voltage < 35 V (peak)/24 V dc complying with 14.6.3 and V-0 in annex G, G.1.1	N
	Switch controlling < 0.2A with open contact voltage > 35 V (peak)/24 V dc complying with 14.6.4 and V-0 in annex G, G.1.1	N
14.6.2	Switch tested to 14.6.1 b) constructed to IEC 61058-1 sub clause 13.1 and has making/breaking action independent of speed of actuation	N
14.6.3	Switch tested to 14.6.1 b) compliant with IEC 61058-1 sub clause 16.2.2 d) and m) not attaining excessive temperatures in use	N
14.6.4	Switch tested to 14.6.1 b) has adequate dielectric strength	N
14.6.5	Mains switch controlling mains socket outlets additional tests to IEC 60058-1	N
	Socket outlet current marking correct	N
14.7	Safety interlocks	N
	Safety interlocks to 2.8 of IEC 60 950	N
14.8	Voltage setting devices	N
	Voltage setting device not likely to be changed accidentally	N
14.9	Motors	N
14.9.1	Endurance test on motors	N
	Motor start test	N
	Dielectric strength test	N
14.9.2	Not adversely affected by oil or grease etc.	N
14.9.3	Protection against moving parts	N



Report No: BST18021043950001Y-1SR-2

14.9.4	Motors with phase-shifting capacitors, three- phase motors and series motors meet Cl. B.8, B.9 and B.10 of IEC 60 950, Annex B	Ν
14.10	Batteries	N
14.11	Optocouplers	N
	Optocouplers comply with Cl. 8	Ν
	Internal and external dimensions to 13.1or alternatively 13.6 (jointed insulation)	N
14.12	Surge suppression varistors	N
	Comply with IEC 61051-2	N
	Not connected between mains and accessible parts except for earthed parts of permanently connected apparatus	N
	Complies with the current pulse, fire hazard and thermal stress requirements of 14.12	N

15	Terminals		Р
15.1.1	Mains plug, appliance inlet, interconnection couplers and mains socket-outlet meet the appropriate standard		Р
15.1.2	Connectors for antenna, earth, audio, video or c	data:	Р
	No risk of insertion in mains socket-outlets		Р
	No risk of insertion into audio or video: outlets marked with the symbol of 5.2		Р
15.1.3	Output terminals of AC adaptors or similar devices not compatible with household mains socket-outlets		Р
15.2	Provision for protective earthing		N
	Accessible conductive parts of Class I appliance reliably connected to earth terminal, within appliance		Ν
	Class I supply appliance with non-hazardous live output voltage: output circuit not connected to earth		Ν
	Protective earth conductors correctly coloured		N



Report No: BST18021043950001Y-1SR-2

	Appliance with non-detachable mains cord provided with separate protective earth terminal near mains input	N
	Protective earth terminal resistant to corrosion	N
	Earth resistance $\leq \square 0, 1 \Omega$	N
15.3	Terminals for external flexible cords and for permanent connection to the mains supply	N
15.3.1	Adequate terminals for connection of permanent wiring	N
15.3.2	Reliable connection of non-detachable cords	N
	not soldered to conductors of a printed circuit board	N
	adequate clearances and creepage distances between connections should a wire break away	N
	wire secured by additional means to the conductor	N
15.3.3	Screws and nuts clamping conductors have adequate threads: ISO 261, ISO 262 or similar	N
15.3.4	Soldered conductors wrapped around terminal prior to soldering or held in place by additional means	N
	Clamping of conductor and insulation if not soldered or held by screws	N
15.3.5	Terminals allow connection of appropriate cross-sectional area of conductors, for the rated current of the appliance	N
15.3.6	Terminals to 15.3.3 have sizes required by Table 16	N
15.3.7	Terminals clamp conductors between metal and have adequate pressure	N
	Terminals designed to avoid conductor slipping out when tightened or loosened	N
	Terminals adequately fixed to avoid loosening when the clamping is tightened or loosened and stress on internal wiring is avoided	N
15.3.8	Terminals carrying a current more than 0,2 A: contact pressure not transmitted by insulating material except ceramic	N
15.3.9	Termination of non-detachable cords: wires terminated near to each other	N



Report No: BST18021043950001Y-1SR-2

	Terminals located and shielded: test with 8mm strand	N
15.4	Devices forming a part of the mains plug	N
15.4.1	No undue strain on mains socket-outlets	N
15.4.2	Device complies with standard for dimensions of mains plugs	N
15.4.3	Device has adequate mechanical strength (tests a,b,c)	N

16	External flexible cords	N
16.1	Mains cords sheathed type, complying with IEC 60 227 for PVC or IEC 60 245 for synthetic rubber cord	N
	Non-detachable cords for Class I have green/yellow core for protective earth	N
16.2	Mains cords conductors have adequate cross- sectional area for rated current consumption of the appliance	N
16.3	a) Flexible cords not complying with 16.1, used for interconnections between separate units of appliance used in combination and carrying hazardous live voltages, have adequate dielectric strength	N
	b) Flexible cords not complying with 16.1, withstand bending and mechanical stress (3.2 of IEC 60 227-2)	N
16.4	Flexible cords used for connection between appliance have adequate cross-sectional areas to avoid temperature rise under normal and fault conditions	N
16.5	Adequate strain relief on external flexible cords	N
	Not possible to push cord back into appliance	N
	Strain relief device unlikely to damage flexible cord	N
	For mains cords of Class I appliance, hazardous live conductors become taut before earth conductor	N
16.6	Apertures for external flexible cord: no risk of damage to the cord during assembly or movement in use	N



Report No: BST18021043950001Y-1SR-2

16.7	Transportable musical instruments and amplifiers fitted with detachable cord set with appliance inlet to IEC 60 320-1	N
	Transportable musical instruments and amplifiers fitted with detachable cord sets or with means of stowage to protect the cord	N

17	Electrical connections and mechanical fixings		Р
17.1	Torque test to Table 12	See below.	Р
	Screws into metal: 5 times		N
	Screws into non-metallic material: 10 times	2.3mm, 0.4Nm	Р
17.2	Correct introduction into female threads in non-metallic material		N
17.3	Cover fixing screws: captive		Ν
	Non-captive fixing screws: no hazard when replaced by a screw whose length is 10 times its diameter		N
17.4	No loosening of conductive parts carrying a current > 0,2 A		N
17.5	Contact pressure not transmitted through plastic other than ceramic for connections carrying a current > 0,2 A		N
17.6	Stranded conductors of flexible supply cords carrying a current > 0,2 A with screw terminals not consolidated by solder		N
17.7	Cover fixing devices other than screws have adequate strength and their positioning is unambiguous		N
17.8	Fixing devices for detachable legs or stands provided		N
17.9	Internal pluggable connections, affecting safety, unlikely to become disconnected		Р

18	Mechanical strength of picture tubes and protection against the effects of implosion	N
	Picture tube separately approved to IEC 61965:	N
	Picture tube separately approved to 18.1	N



Report No: BST18021043950001Y-1SR-2

18.1	Picture tubes > 16 cm intrinsically protected	N
	Non-intrinsically protected tubes > 16 cm used with protective screen	Ν
18.2	Intrinsically protected tubes: tests on 12 samples	N
18.2.1	Samples subject to ageing: 6	N
18.2.2	Samples subject to implosion test: 6	N
18.2.3	Samples subject to mechanical strength test (steel ball): 6	Ν
18.3	Non-intrinsically protected tubes tested to 18.3	N

19	Stability and mechanical hazards		N
	Mass of the appliance exceeding 7 kg	Approx. 0.915kg	N
19.1	Test on a plane, inclined at 10°C to the horizontal		N
19.2	100 N applied vertically downwards		N
19.3	Apparatus mass > 25kg or height > 1M or supplied with cart or stand		N
19.4	Edges and corners not hazardous	No sharp edges or corners	Р
19.5	Glass surfaces with an area exceeding 0,1 m ² or maximum dimension > 450 mm, pass the test of 19.5.1	No such surfaces on main	N
19.6	Wall or ceiling mountings adequate		N

20	Resistance to fire	Р
20.1	Electrical components and mechanical parts	Р
	a) Exemption for components contained in an enclosure of material FV 0 to IEC 60 707 with openings not exceeding 1 mm in width	N
	b) Exemption for small components as defined in 20.1	Р
20.1.1	Electrical components meet the requirements of 14.2.5, 14.4, 14.5.3, 14.6.6 or 20.1.4	Р



Report No: BST18021043950001Y-1SR-2

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20.1.2	Insulation of internal wiring working at	Intrenal wiring working at	Р
	voltages > 4 kV or leaving an internal fire	voltages not exceeding 4kV.	
	enclosure, not contributing to the spread of fire		
20.1.3	Material of printed circuit boards on which the		N
	available power exceeds 15 W at a voltage		
	between 50 V and 400 V (peak) a.c. or d.c.		
	meets FV 1 or better to IEC 60 707, unless		
	used in a fire enclosure		
	Material of printed circuit boards on which the		Ν
	available power exceeds 15 W at a voltage		
	400V (peak) a.c. or d.c. meets FV 0 to		
	IEC 60 707		
20.1.4	Components and parts not covered by 20.1.1,		Ν
	20.1.2 and 20.1.3 (other than fire enclosures)		
	mounted nearer to a potential ignition source		
	than the distances in Table 13 comply with the		
	relevant flammability category in Table 13		
	Components and parts as above but shielded		Ν
	from a potential ignition source, with the		
	barrier area in accordance with Table 13 and		
	fig. 13		
	Apparatus with voltages > 4KV under normal		Ν
	conditions, and distances to enclosure exceed		
	those specified by Table 21, HB40 min		
	enclosure		
20.2	Fire enclosure		Р
20.2.1	Potential ignition sources with open circuit	No such voltage	N
20.2.1	voltage > 4 kV (peak) a c or d c contained in	no cuch venage	
	a fire enclosure to EV 1		
20.2.2	Internal fire enclosures with openings not		Р
20.2.2	exceeding 1 mm in width and with openings for		•
	wires completely filled		
2023	Requirements of 20 2 1 and 20 2 2 met by an		N
20.2.0	internal fire enclosure		
1			

A	ANNEX A: ADDITIONAL REQUIREMENTS FOR APPARATUS WITH PROTECTION AGAINST SPLASHING WATER	N
A.5.1	Marked with IPX4 (IEC 60 529), 5.4.1 a) does not apply	N
A.10.2.1	Enclosure provides protection against splashing water	N
A.10.2.2	Humidity treatment carried out for 7 days	N

В	ANNEX B: APPARATUS TO BE CONNECTED TO THE TEL		N
	ECOMMUNICATION NETWORKS	(No such connection means)	



Report No: BST18021043950001Y-1SR-2

B.5.4.1	Where the separation of TNV circuits from other circuits relies on protective earthing the instructions make it clear that protective earthing is essential	Ν
B.8.1	TNV circuits separated from the mains circuit and from hazardous live parts by either	Ν
	double or reinforced insulation	N
	basic insulation with earthed protective screening	N
B.8.2	TNV circuits separated from circuits other than those in B.8.1 and from accessible conductive parts by basic insulation meeting the requirements for clearances and creepage distances for the voltages concerned	Ν
B.9.1.1	TNV circuit terminals contacts which cannot be touched by probe B.1, exempt from the requirements inaccessible terminal contacts in 9.1.1	Ν
B.10.1	Insulation between TNV terminals and antenna terminals (including interconnection terminals which may be connected to equipment with antenna terminals) withstands the 50 discharges of 10.1	Ν
B.14.12	Surge suppressors between TNV circuits and other parts of the equipment have breakdown voltage at least 1,8 times the mains voltage	N

С	ANNEX C: BAND-PASS FILTER FOR WIDE-BAND NOISE MEASUREMENT	Ν

D	ANNEX D: MEASURING NETWORK FOR TOUCH CURRENTS (see 9.1.1.1)	N
	Measuring instrument	N

E	ANNEX E: MEASURENENT OF CLEARANCES AND CREEPAGE DISTANCES (see 13)	N
F	ANNEX F: TABLE OF ELECTROCHEMICAL POTENTIALS	N
G	ANNEX G: FLAMMABILITY TEST METHODS	N



Report No: BST18021043950001Y-1SR-2

Н	ANNEX H: INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION					
H.1	Intentionally kept free	N				
H.2	Type tests	N				
H.2.1	Dielectric strength	Ν				
H.2.2	Flexibility and adherence	Ν				
H.2.3	Heat shock	Ν				
H.2.4	Retention of dielectric strength after bending	Ν				
H.3	Testing during manufacture	Ν				
H.3.1	Routine test	Ν				
H.3.2	Sampling test	N				

J	ANNEX J: ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES				
J.1	Summary of the procedure of for determining minimum clearances	N			
J.2	Determination of mains transient voltage	N			
J.3	Determination of telecommunication network transient voltage	N			
J.4	Determination of required withstand voltage	N			
J.5	Measurement of transient levels	N			
J.6	Determination of minimum clearances	N			

К	ANNEX K: IMPULSE TEST GENERATORS	N

Μ	ANNEX M: EXAMPLES OF REQUIREMENTS FOR QUALITY CONTROL PROGRAMMES		
M.1	Reduced clearances (see 13.3)	N	



Ν	ANNEX M: ROUTINE TESTS	N
N.1	Tests during the production process	N
N.1.1	Correct polarity and connection of components or subassemblies	Ν
N.1.2	Correct values of components	N
N.1.3	Protective earthing connection of screens and metal barriers	N
N.1.4	Correct position of internal wiring	N
N.1.5	Correct fit of internal plug connections	N
N.1.6	Safety relevant markings inside the apparatus	N
N.1.7	Correct mounting of mechanical parts	N
N.2	Tests at the end of the production process	N
N.2.1	Dielectric strength test	N
N.2.2	Protective earthing connection	N
N.2.3	Safety relevant marking on the outside of the apparatus	N

ZA	ANNEX ZA: OTHER INTERNATIONAL PUBLICATIONS QUOTED IN THIS	N
	STANDARD WITH THE REFERENCES OF THE RELEVANT EURPEAN	
	PUBLICATIONS	

ZB	ANNEX ZB: SPECIAL NATIONAL CONDITIONS					
2.6.1	DK: certain types of Class I apparatus, see 15.1.1, may be provided with a plug not establishing earthing continuity when inserted in Danish socket-outlets		N			
13.3.1	NO: In Norway, due to the IT power distribution system used, the a.c. MAINS supply voltage is considered to be equal to the line-to-line voltage, and will remain 230V in case of a single earth fault		Ν			



15.1.1	DK: mains cord for single-phase equipment	N
	having a rated current not exceeding 10 A	
	shall be provided with a plug according to	
	Heavy Current Regulations Section 107-2-D1	
	DK: Class Lequipment with socket-outlets with	N
	DR. Class requipment with socker-outlets with	IN
	earthing contact, or which are intended to be	
	used in locations where protection against	
	indirect contact is required shall be provided	
	with a plug in compliance with Standard Sheet	
	DK 2-1a	
	DK: socket-outlets for providing power to	Ν
	Class II equipment with a rated current of 2.5	
	A shall have dimensions according to the	
	A shall have unitensions according to the	
	drawing on page 131 of EN 60 065:98 other	
	dimensions shall be to IEC 60 083 Standard	
	Sheet C 1a for portable socket-outlets	
	DK: other dimensions shall be in compliance	Ν
	with the Heavy Current Regulations. Section	
	107-2-D1. Standard Sheet DKA 1-3 for	
	portable socket-outlets shutters are not	
	required	
	DK: mains socket-outlets with earthing contact	N
	shall comply with Heavy Current Regulations	
	Section 107-2-D1, Standard Sheet DK 1-3a,	
	DK 1-5a or DK 1-7a	
	IE: equipment fitted with a flexible cable or	Ν
	cord provided with a 13 A plug in accordance	
	with Statutory Instrument 525.97 13 A plugs	
	and Conversion Adapters for Demostic Lise	
	Degulationer 1007	
	Regulations: 1997	
	NO: mains socket-outlets on Class II	N
	equipment meet CEE Publication 7 with the	
	following amendments:	
	dimensions 2,5 A, 250 V two-pole socket-	N
	outlets for electronic apparatus shall comply	
	with the enclosed Standard Sheet I	
	mechanical strength 2.5 A 250 V socket	N
	autora for CLASS II algebraria apparatus	IN
	tested as analiticating EN 00.005 40.4.0	
	tested as specified in EN 60 065, 12.1.3	
	protecting rim also tested	N
	I Inited kingdom: equipment fitted with a flexible	N
	cable or cord provided with a 12A PS 1262	IN
	alum en in Otatutamu Instrument 4700.04	
	plug as in Statutory Instrument 1/68:94	
J.2	NO: due to the IT power distribution system	N
	used, the a.c. MAINS supply voltage is	
	considered to equal to the line-to-line voltage.	
	and will remain 230V in case of single earth	
	fault	
	TOUR	



Report No: BST18021043950001Y-1SR-2

ZC	ANNEX ZC: A-DEVIATIONS	N
5	DE: additional markings required in German language:	N
	cathode ray tubes with an accelerating voltage between 20 kV and 30 kV (marking on the tube)	N
	TV receivers whose picture tube has an accelerating voltage between 20 kV and 30 kV	N
	TV receivers whose picture tube has an accelerating voltage greater than 30 kV	Ν
	TV receivers whose picture tube has an accelerating voltage less than 20 kV	Ν
5.1	IT: additional markings on the outside of the TV receiver in Italian language	Ν
	IT: user instructions in Italian language including a conformity declaration	Ν
	IT: certification number on the back cover	Ν
14	Sweden: switches containing mercury such as thermostats, relays and level controllers are no allowed	N



Table 7.1	Tempe	Temperature rise measurement									Р
	Power of the f (W)	Power consumption in the OFF/Stand-by mode of the functional switch (W)					3W N	Max			
Un(V)	Un(V) Hz In(A) Pn(W				Uout(V) Pout(W Operating Condition / Statu			Status			
12		0.8	10.2					EUT	Normal working.		
Note:	Note:										
	Loudsp impeda	eaker nce(Ω)							4Ω		—
	Severa	l IS		loudspea	aker				1		Р
	Marking	g o s	f	loudspea	aker			Inter	nally integrated		N/A
Tempera	ture Rise	dT of Part	:				dT((K)		Limit r	nax dT(K)
Supply vo	ltage			EUT Normal working.			g.				
C2				30.4							70
PCB near	r U1			35.3							
Internal w	vire			7.5					45		
Enclosure	e near U1 i	nside		9.7						70	
Enclosure	e near U1 o	outside		6.5					60		
Ambient(°	C)			25.0							
Ambient t	emperature	e(°C)							_		
Ambient temperature(°C)											
Temperature rise dT of winding: dT= <u>(R₂-R₁)</u> X(234.5+t1)-(t2-t1) R ₁			g:	R₁(Ω)	R₂	2(Ω)	dT(K) Limit max(K) In		Insula	ation class	
Note: 1. M cla	Note: 1. Measurements were carried out with the apparatus positioned inside the box specified by the clause 4.1.4 of the standard.										

Table 7.2

Softening temperature of thermoplastics

Ν



Report No: BST18021043950001Y-1SR-2

Temperature T of part	T – normal conditions (°C)	T – fault conditions (°C)	Min T softening (°C)	

Note:

The test have been performed on connector at a temperature of the penetrations are as following: bobbin and connecter: < 0.1mm

Table 9.1.1	Electric shock hazard under normal condition							
Touch current measured between:		Condition	Uoc(V)	U1(V)	Limit U1(Vpk)	U2(V)	Limit U2(Vpk)	
Note:								

"A" refer to terminal "A" and "B" refers to terminal "B" of the measuring network of Annex D.

Table 10.3 Insulation resistance Measurements			
Location		Measured [MΩ]	Allowed [MΩ]

Table 10.3	3 Electric strength measurements					
Location		Test voltage [V]	Breakdow	n		

Table 11.1	Electric shock hazard under abnormal condition						
Touch currer between:	nt measured	Condition	Uoc(V)	U1(V)	Limit U1(Vpk)	U2(V)	Limit U2(Vpk)
Noto							

Note:

"A" refer to terminal "A" and "B" refers to terminal "B" of the measuring network of Annex D.

Table 11.2	Summary of fault condition tests		
	Voltage(V) 09 or 1.1 times rated voltage	EUT Normal working.	-
	Frequency(Hz)		



Report No: BST18021043950001Y-1SR-2

Ambient temperature(°C)			25.1	—	
No.	Component	Fault	Test time	Fuse current(A)	Observation
1	C6	S-C	10mins	0.013	Unit shutdown immediately, no damage, no hazard.
2	R2	S-C	10mins	0.011	Unit shutdown immediately, no damage, no hazard.
3	Speaker	S-C	7hours	0.012	Unit shutdown immediately, input current:0.012A, no damage, no hazard.
4	DC motor	B-L	7hours	0.013	Unit shutdown immediately, input current:0.013A, no damage, no hazard.

Fault: S-C=short circuit, O-L =overload, B-L = blocked, O-C =open circuit.

Table 13.2	able 13.2 TABLES: working voltage measurement						
Location		RMS voltage(V)	Peak voltage(V)	Comments			

Table 13	TABLES: clearances a	ES: clearances and creepage distances						
2N force on internal parts applied:								
30N force on applied:	outside of conductive							
Location		Working	y voltage	Clearance	e(mm)	Creepage	(mm)	
		Urms	Upeak	Min	Actual	Min	Actual	



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Report No: BST18021043950001Y-1SR-2

TABLE: List of critical components							
Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity ¹)		
Power plug (EN)	SHENZHEN NANFANG ELECTRONIC PRODU CT CO., LTD.	NF-008	7.5-10A	NSW25829	SAA		
Power cord	SHENZHEN NANFANG ELECTRONIC PRODU CT CO., LTD.	H03VVH2- F2*0.5MM2	2*0.5mm ²	NSW25547	SAA		
Fuse	DONGGUAN HONGDA ELECTRONIC TECHNOLOGY CO.,LTD.	31 TD- Serie(s)	AC 250V/2A	E318938	UL		
Transformer	SHENXHEN LANYIN TECHNOLOGY CO., LTD	CH2012-2	Class 130(B) insulation system, designated sbi4.2	E320270	UL		
Line filter	SHENXHEN LANYIN TECHNOLOGY CO., LTD	UU9.8	130°C	E320270	UL		
Y capacitor	JYA-NAY CO., LTD	JNC	MAX.1000pF,min .250Vac,125°C,Y 1 type	UL60384-14 E201384	UL		
Heat shrinkable tubing	GUANGZHOU KAIHENG NEW MATERIAL CO LTD	K-102	600V 125°C	VW-1 E321827	UL		
Heat shrinkable tubing	SHENZHEN WOLIDA TRADING CO LTD	RSFR-H	600V 125°C	VW-1 E329530	UL		
Optocoupler	EVERLIGHT ELECTRONICS COLTD	EL817	Reinforced insulation.ext.cr. >8.0mm,dti≥0.4m m.Thermal cycle test	FPQU2 FPQU8 E214129	UL		
РСВ	MEIZHOU VENEERBLE ELECTRONIC- TECH.CO LTD	94V-0	Rated V-0,130°C Min,thickness 1.45mm	FR-1 E354175	UL		



Report No: BST18021043950001Y-1SR-2

Mains switch	WENZHOU SAINT PETER ELECTRONIC TECHNOLOGY CO., LTD	KDC-A10	8A/128A 250VAC	GB15092.1-2010	CQC11002058 684	
Motor	QUANNAN COUNTRY CHAOYA TECHOLOGY CO.,LTD	CY	DC 3.0V DC 2.0V	EN55014- 1:2006+a1:2009+ a2:2011 EN55014- 2:1997+A1:2001+ A2:2008	CE TB14129632	
Laser head	SHENZHEN LONG SHENG HE ELECTRONIC CO.,LTD	FV8	2.0-5.5 Vd.c. Max.0.7mw 650-790nm	EN60825-1	GZES1607009 78331	
¹) An asterisk indicates a mark which assures the agreed level of surveillance						
Supplementary information:						



ANNEX A:

Photo-documentation





Figure 1 General appearance of EUT



Figure 2 General appearance of EUT





Figure 3 General appearance of EUT



Figure 4 General appearance of EUT





Figure 5 General appearance of PCB

End of the report