

TEST REPORT
IEC 60 065
Audio, video and similar electronic apparatus
Safety requirements

Report Reference No. : JGZ0410139-1

Tested by (+ signature) : Roy Xie



Roy Xie

Approved by (+ signature) : Derek Feng

Derek Feng

Date of issue..... : November 16, 2004

Contents..... : Pages 1 to 43 for IEC60065:2001 TRF including Group differences + National differences for CENELEC countries (EN60065:2002)
 Appendix A1 for National differences of China
 Appendix A2 to A6 for Photo Pages

Testing laboratory Name : **Intertek Testing Services Shenzhen Ltd. Guangzhou GDD Branch**

Address..... : 3/F., Hengyun Building, 728 Kaifa Ave., Guangzhou Economic & Technological Development District, Guangzhou, China

Testing location..... : Same as above

Client Name..... : **Ashdown Design & Marketing Ltd.**

Address..... : Park Farm, Inworth, Colchester, Essex CO5 9SH, U.K.

Standard : **IEC 60065:2001**

Test procedure : N.A.

Non-standard test method..... : N.A.

Test Report Form/blank test report

Test Report Form No. : IEC60065D

Master TRF : reference No. 60065/2001

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Test item Description..... : Guitar Bass EB Amplifier (For model: EB 180H)
 Guitar Bass EB Active Cabinet (For model: EB 12-180, EB 15-180)

Trademark..... : ASHDOWN

Model and/or type reference..... : EB 180H, EB 12-180, EB 15-180

Manufacturer : Dongguan Jingheng Electron Co., Ltd.

Rating(s) : AC 220 – 240V 50/ 60Hz, 250W, Class I



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)

Testing

Date of receipt of test item: 22/10/2004

Date(s) of performance of test.....: 22/10/2004 – 16/11/2004

General remarks

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by a NCB, in accordance with IEC 6065-2.

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

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

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

"(see Annex #)" refers to an annex appended to the report.

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

When determining the test conclusion, the Measurement Uncertainty of test has been considered.

Pollution degree 2 apply for the apparatus covered in this report, and the material groups used in this apparatus were classified as material group IIIb.

EB 12-180, EB 15-180 were identical to EB 180H in circuit diagram, The difference between them is:

1. EB 180H was single amplifier module with wooden enclosure(Size: 195 x 525 x 385 mm, Weight: 8 kg);
2. For EB 12-180, a 12" speaker with wooden box was constructed additionally to the amplifier module(Size: 693 x 475 x 655 mm, Weight: 25 kg);
3. For EB 15-180, a 15" speaker with wooden box was constructed additionally to the amplifier module(Size: 693 x 485 x 665 mm, Weight: 25 kg).

We have considered all these changes during the evaluation.

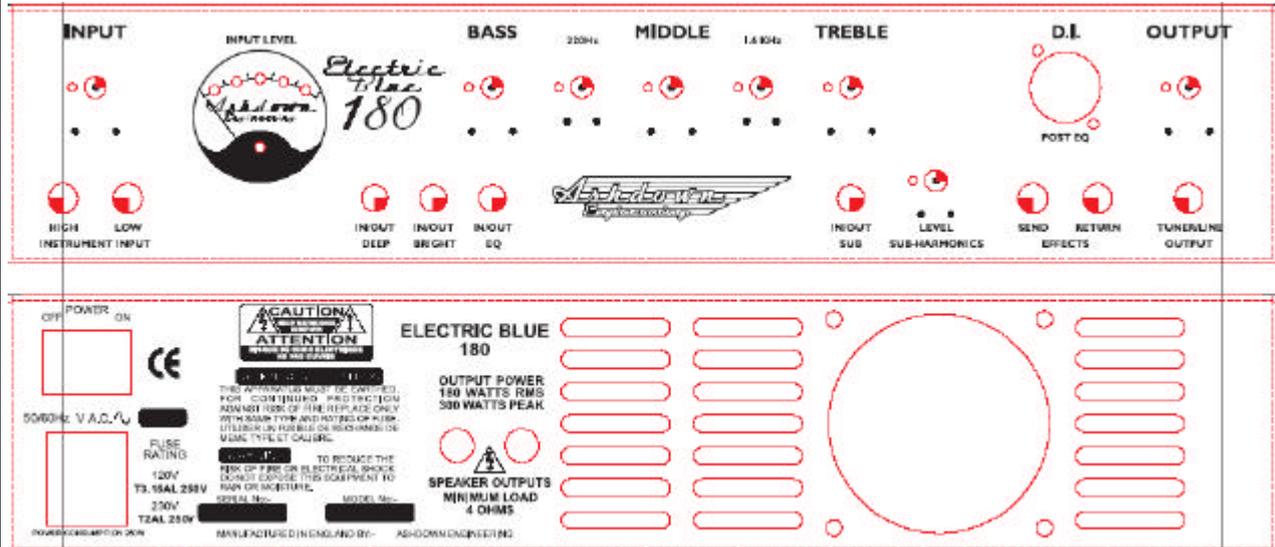
Summary of Testing and Conclusions

The sample(s) tested complies with the requirements of IEC 60065_2001



Copy of marking plate

Representative:



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
3	GENERAL REQUIREMENTS		
	Safety class of the apparatus	Class I apparatus	P
4	GENERAL CONDITIONS OF TESTS		
4.1.4	Ventilation instructions require the use of the test box	Boxed used	P
5	MARKING		
	Comprehensible and easily discernible	On the front and rear enclosure	P
	Permanent durability against water and petroleum spirit	Silk-screen printed	P
5.1	Identification, maker, model	Trademark: ASHDOWN Model: EB 180H	P
	Class II symbol if applicable	Class I apparatus	N
	Rated supply voltage and symbol	AC 220 - 240V 	P
	Frequency if safety dependent	50/60 Hz	P
	Rated current or power consumption	250W	P
5.2	Earth terminal		P
	Hazardous live terminals	No such terminal	N
	Supply output terminals (other than mains)	No such terminal	N
5.3	Use of triangle with exclamation mark	Marked on the circuit diagram	P
5.4	Instructions for use		
5.4.1	Mains powered equipment not exposed to dripping or splashing. Warning concerning objects filled with liquid, etc.	Mention in the user manual	P
	Hazardous live terminals, instructions for wiring	No such terminal	N
	Instructions for replacing lithium battery	No battery used	N
	Instructions for model if fitted	No such device	N
	Class I earth connection warning	Mentioned in the user manual	P
	Instructions for multimedia system connection	Not such apparatus	N
	Special stability warning for fixed installation	Not such apparatus	N
5.4.2	Disconnect device: plug/coupler or all-pole mains switch location, accessibility and markings	Mentioned in the user manual	P
	Instructions for permanently connected equipment	Not permanently connected equipment	



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict

6	HAZARDOUS RADIATION		
6.1	Ionizing radiation ≤ 36 pA/kg (0,5 mR/h)	No ionizing radiation	N
6.2	Laser radiation, emission limits to IEC 60825-1 ... :	No such device	N
	Emission limits under fault conditions		N

7	HEATING UNDER NORMAL OPERATING CONDITIONS		
7.1	Temperature rises not exceeding specified values, no operation of fuse links	(see appended table)	P
7.1.1	Temperature rise of accessible parts	(see appended table)	P
7.1.2	Temperature rise of parts providing electrical insulation	(see appended table)	P
7.1.3	Temperature rise of parts acting as a support or as a mechanical barrier		N
7.1.4	Temperature rise of windings	(see appended table)	P
7.1.5	Parts not subject to a limit under 7.1.1 to 7.1.4		N
7.2	Softening temperature of insulating material supporting parts conductively connected to the mains carrying a current $> 0,2$ A at least 150°C		N

8	CONSTRUCTIONAL REQUIREMENTS WITH REGARD TO THE PROTECTION AGAINST ELECTRIC SHOCK		
8.1	Conductive parts covered by lacquer, paper, untreated textile oxide films and beads etc. considered to be bare	Not used	P
8.2	No shock hazard when changing voltage setting device, fuse-links or handling drawers etc.	Tools are required	N
8.3	Insulation of hazardous live parts not provided by hygroscopic material	No hygroscopic material used	P
8.4	No risk of electric shock following the removal of a cover which can be removed by hand		P
8.5	Class I equipment		



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
	Basic insulation between hazardous live parts and earthed accessible parts	Creepage distance between: 1. Connection poles of appliance inlet and enclosure: 14.0 mm 2. Connection poles of switch to enclosure: 14.4 mm Clearance between: 1. Connection poles of appliance inlet and enclosure: 10.1 mm 2. Connection poles of switch to enclosure: 12.8 mm (Measured working voltage: 240 Vrms, 340 Vpeak, Clearance Limit = 2.0 mm, Creepage distance limit = 2.5 mm)	P
	Resistors bridging basic insulation complying with 14.2.1 a)	No such component	N
8.6	Class II equipment and Class II constructions within Class I equipment	Class II construction within class I equipment	P
	Reinforced or double insulation between hazardous live parts and accessible parts		P
	Components bridging reinforced or double insulation complying with 14.1 a) or 14.3	No such component	N
	Basic and supplementary insulation each being bridged by a capacitor complying with 14.2.1 a)	No such component	N
	Reinforced or double insulation being bridged with 2 capacitors in series complying with 14.2.1 a)		N
	Reinforced or double insulation being bridged with a single capacitor complying with 14.2.1 b)		N
	Basic insulation bridged by components complying with 14.3.4.3		N
8.7	Basic insulation between parts at 35V to 71V (peak) a.c. or 60V to 120V d.c. and accessible parts	No such circuit	N
	Reinforced or double insulation between circuits operating at voltages between 35V and 71V (peak) a.c. or between 60 V and 120 V d.c. and hazardous live parts at higher voltage		N
	Separation by Class II isolating transformer		
	Separation by Class I transformer		



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
	Separation by earthed conductive part		N
8.8	Basic or supplementary insulation $\geq 0,4$ mm (mm) :		N
	Reinforced insulation $\geq 0,4$ mm (mm)		N
	Thin sheet insulation		P
	Basic or supplementary insulation, at least two layers, each meeting 10.3		N
	Basic or supplementary insulation, three layers any two of which meet 10.3		N
	Reinforced insulation, two layers each of which meet 10.3		N
	Reinforced insulation, three layers any two which meet 10.3	Four layers of insulating tape used as reinforced insulation between primary winding and secondary winding with one layer thickness: 0.04mm Any of two layers were complied with 4240Vpeak of clause 10.3	P
8.9	Adequate insulation between internal hazardous live conductors and accessible parts	The insulation thickness of internal live wire: 0.77 mm	P
	Adequate insulation between internal hazardous live parts and conductors connected to accessible parts		P
8.10	Double insulation between conductors connected to the mains and accessible parts	No secondary wires can come into contact with live parts.	P
8.11	Detaching of wires		
	No undue reduction of creepages or clearance distances if wires become detached	1. Connector and cable tie used to fix the primary wires 2. Inserted into hole before soldering and cable tie, connector used to fix the secondary wires	P
	Vibration test carried out	No, no need, see above	N
8.12	Adequate cross-sectional area of internal wiring to mains socket-outlets	No socket-outlet used	N
8.13	Adequate fastening of windows, lenses, lamp covers etc. (pull test 20 N for 10 s)		P
8.14	Adequate fastening of covers (pull test 50 N for 10 s)		N



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
8.15	No risk of damage to the insulation of internal wiring due to hot parts or sharp edges		P
8.16	Only special supply equipment can be used	Not such equipment	N
8.17	Insulated winding wire without additional interleaved insulation	No such component	N
8.18	Endurance test as required by 8.17		N
8.19	Disconnection from the mains		
8.19.1	Disconnect device	Mains plug	P
	All-pole switch or circuit breaker with $\geq 3\text{mm}$ contact separation		N
8.19.2	Mains switch ON indication		N
8.20	Switch not fitted in the mains cord		P
8.21	Bridging components comply with clause 14	No such component	N



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict

9	ELECTRIC SHOCK HAZARD UNDER NORMAL OPERATING CONDITIONS		
9.1	Testing on the outside		
9.1.1	For voltages >1000 V ac or >1500 V dc complies with clause 13.3.1 for basic insulation	No such high voltage	N
9.1.1.1	Touch current measured from terminal devices using the network in annex D	U1: 850 mVpeak U2: 220 mVpeak	P
	Discharge not exceeding 45 μ C	0.67 μ C < 45 μ C	P
	Energy of discharge not exceeding 350 mJ	< 15 kV	N
9.1.1.2	Test with test finger and test probe		P
9.1.2	No hazardous live shafts of knobs, handles or levers		P
9.1.3	Ventilation holes and other holes tested by means of 4 mm x 100 mm test pin		P
9.1.4	Terminal devices tested with 1 mm x 20 mm test pin (10 N); test probe D of IEC 61032		P
	Terminal devices tested with 1 mm x 100 mm straight wire (1 N); test probe D of IEC 61032		P
9.1.5	Pre-set controls tested with 2,5 mm x 100 mm test pin (10 N); test probe C of IEC 61032	No pre-set control used	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 μ F no test needed	No mains capacitance measured	N
9.1.7	Enclosure sufficiently resistant to external force		P
	Test probe 11 of IEC 61032 for 10 s (50 N)		P
	Test hook of fig. 4 for 10 s (20 N)		P
	30 mm diameter test tool for 5 s (100 or 250 N) ... :	100 N	P
9.2	No hazard after removing a cover by hand	Tools are required	P

10	INSULATION REQUIREMENTS		
10.1	Insulation resistance (MO) at least 2 MO min. after surge test for basic and 4 MO min. for reinforced insulation		N
10.2	Humidity treatment 48 h or 120 h	48 h	P
10.3	Insulation resistance and dielectric strength	(see appended table)	P



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict

11	FAULT CONDITIONS		
11.1	No shock hazard under fault condition		P
11.2	Heating under fault condition		P
	No hazard from softening solder		P
11.2.1	Measurement of temperature rises	(see appended table)	P
11.2.2	Temperature rise of accessible parts	(see appended table)	P
11.2.3	Temperature rise of parts, other than windings, providing electrical insulation	(see appended table)	P
	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 20.1.3, 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 20.1.3 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		P
11.2.4	Temperature rise of parts acting as a support or mechanical barrier		N
11.2.5	Temperature rise of windings	(see appended table)	P
11.2.6	Temperature rise of parts not subject to the limits of 11.2.1 to 11.2.5		N

12	MECHANICAL STRENGTH		
12.1.1	Bump test where mass >7 kg	No damage	P
12.1.2	Vibration test	No damage	P
12.1.3	Impact hammer test		P
	Steel ball test		P
12.1.4	Drop test for portable apparatus where mass ≤ 7 kg	Not portable apparatus	N
12.1.5	Thermoplastic enclosures stress relief test		N
12.2	Fixing of knobs, push buttons, keys and levers		
12.3	Remote controls with hazardous live parts	No such component	



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
12.4	Drawers (pull test 50 N, 10 s)	No such component	N
12.5	Antenna coaxial sockets providing isolation	No such component	N
12.6	Telescoping or rod antennas construction	No such component	N
12.6.1	Telescoping or rod antennas securement		N
13	CLEARANCE AND CREEPAGE DISTANCES		
13.1	Clearances in accordance with 13.3		P
	Creepage distances in accordance with 13.4		P
13.2	Determination of operating voltage		P
13.3	Clearances		
13.3.2	Circuits conductively connected to the mains comply with table 8 and, where applicable, table 9	The clearance between different polarity on mains transformer: 19.2 mm (Measured working voltage: 240 Vrms, 340 Vpeak, Clearance Limit = 2.0 mm)	P
13.3.3	Circuits not conductively connected to the mains comply with table 10		N
13.4	Creepage distances		
	Creepage distances greater than table 11 minima	The creepage distance between different polarity on mains transformer: 19.2 mm (Measured working voltage: 240 Vrms, 340 Vpeak, Creepage distance Limit = 2.5 mm)	P
13.5	Printed boards		
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
13.6	Conductive parts along uncemented joints clearances and creepage distances comply with 13.3 and 13.4		N
	Conductive parts along reliably cemented joints comply with 8.8		N
13.7	Enclosed, enveloped or hermetically sealed parts: not conductively connected to the mains: clearances and creepage distances as in table 12		



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
13.8	Parts filled with insulating compound, meeting the requirements of 8.8		N

14	COMPONENTS		
14.1	Resistors		
	a) Resistors between hazardous live parts and accessible metal parts	No such component	N
	a) Resistors separately approved		N
	b) Resistors, other than between hazardous live parts and accessible parts	No such component	N
	b) Resistors separately approved		N
14.2	Capacitors and RC units		
	Capacitors separately approved	No such component	N
14.2.1	Y capacitors tested to IEC 60384-14, 2 nd edition ...		N
14.2.2	X capacitors tested to IEC 60384-14, 2 nd edition ...		N
14.2.3	Capacitors operating at mains frequency but not connected to the mains: tests for X2	No such component	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	Metal case capacitor used	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 V-0 or metal		N
14.3	Inductors and windings		
	Comply with IEC 61558-1, IEC 61558-2 (as relevant) and clause 20.1.4		N
14.3.1	Transformers and inductors marked with manufacturer's name and type	Manufacturer: Top Cheers Model: EB180-230	P
	Transformers and inductors separately approved :	No, tested in appliance	N
14.3.2	General		P
14.3.3	Constructional requirements		P
14.3.3.1	Clearances and creepage distances comply with clause 13		P
14.3.3.2	Transformers meet the constructional requirements		



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
14.3.4.1	Class II transformers have adequate separation between hazardous live parts and accessible parts (double or reinforced insulation)	Clearance and creepage distance between primary winding and secondary: 15.2 mm (Measured working voltage: 255 Vrms, 360 Vpeak, Clearance Limit = 4.0 mm, Creepage distance limit = 5.2 mm)	P
	Coil formers and partition walls $\geq 0,4$ mm		N
14.3.4.2	Class I transformers, with basic insulation and protective screening only if all 7 conditions of 14.3.4.2 are met		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)	Insulation between primary winding and secondary winding of switching mode transformer complied with reinforced insulation (4240Vpeak)	P
	Coil formers and partition walls $\geq 0,4$ mm		N
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		N
14.4	High voltage components		
	High-voltage components and assemblies: $U > 4$ kV (peak) separately approved	No such component	N
	Component meets category V-1 of IEC 60707		N
14.4.1	High voltage transformers and multipliers tested as part of the submission		N
14.4.2	High voltage assemblies and other parts tested as part of the submission		N
14.5	Protective devices		
	Protective devices used within their ratings		P



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
	External clearances and creepage distances meet requirement of clause 13 for the voltage across the device when opened	<p>Clearance and creepage distance between different polarity of thermal cut-off: 16.0 mm</p> <p>Clearance and creepage distance between different pole of mains current fuse: 9.0 mm</p> <p>(Measured working voltage: 240 Vrms, 340 Vpeak, Clearance Limit = 2.0 mm, Creepage distance limit = 2.5 mm)</p> <p>Clearance and creepage distance between different pole of current fuse(FS1): 2.2 mm</p> <p>Clearance and creepage distance between different pole of current fuse(FS2): 3.4 mm</p> <p>Clearance and creepage distance between different pole of current fuse(FS3): 1.7 mm</p> <p>Clearance and creepage distance between different pole of current fuse(FS4): 4.8 mm</p> <p>(Measured working voltage = 50 Vrms, Clearance Limit = 1.0 mm, Creepage distance limit = 1.2 mm)</p>	P
14.5.1.1	a) Thermal cut-outs separately approved		P
	b) Thermal cut-outs tested as part of the submission		N
14.5.1.2	a) Thermal links separately approved	No such component	N
	b) Thermal links tested as part of the submission		N
14.5.1.3	Thermal devices re-settable by soldering	No such component	N
14.5.2.1	Fuse-links in the mains circuit according to IEC 60127	Main Fuse	P
14.5.2.2	Correct marking of fuse-links adjacent to holder ... :	<p>Mains Fuse: T2AL 250V</p> <p>FS1: T1AL 250V</p> <p>FS2: T1AL 250V</p> <p>FS3: T5AL 250V</p> <p>FS4: T5AL 250V</p>	P
14.5.2.3	Not possible to connect fuses in parallel		



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
14.5.2.4	Not possible to touch hazardous live parts when replacing fuse-links without the use of a tool	Tools are required	P
14.5.3	PTC thermistors comply with IEC 60730-1		P
	PTC devices (15 W) category V-1 or better		N
14.5.4	Circuit protectors have adequate breaking capacity and their position is correctly marked	No such component	N
14.6	Switches		
14.6.1 a)	Separate testing to IEC 61058 including: 10 000 operations Normal pollution suitability Resistance to heat and fire level 3 and V-0 compliance with annex G, G.1.1		P
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 subclause 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 subclause 16.2.2 d), l) 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 IEC61058-1		N
	Socket outlet current marking correct		N
14.7	Safety interlocks		
	Safety interlocks to 2.8 of IEC 60950	No such component	N
14.8	Voltage setting devices		
	Voltage setting device not likely to be changed accidentally	No such component	



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
14.9	Motors		
14.9.1	Endurance test on motors	No such component	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
14.9.4	Motors with phase-shifting capacitors, three-phase motors and series motors meet clause. B.8, B.9 and B.10 of IEC 60950, Annex B		N
14.10	Batteries		
14.10.1	Batteries mounted with no risk of accumulation of flammable gases	No battery used	N
14.10.2	No possibility of recharging non-rechargeable batteries		N
14.10.3	Recharging currents within manufacturers limits		N
	Lithium batteries discharge and reverse currents within the manufacturers limits		N
14.10.4	Battery mould stress relief		N
14.10.5	Battery drop test		N
14.11	Optocouplers		
	Optocouplers comply with Cl. 8	No such component	N
	Internal and external dimensions to 13.1. or alternatively 13.6 (jointed insulation)		N
14.12	Surge suppression varistors		
	Comply with IEC 61051-2	No such component	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		
15.1.1	Mains plug, appliance inlet, interconnection couplers and mains socket-outlet meet the appropriate standard		P
15.1.2	Connectors for antenna, earth, audio, video or data:		
	No risk of insertion in mains socket-outlets		



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
	No risk of insertion into audio or video: outlets marked with the symbol of 5.2		N
15.1.3	Output terminals of a.c. adaptors or similar devices not compatible with household mains socket - outlets		N
15.2	Provision for protective earthing		
	Accessible conductive parts of Class I equipment reliably connected to earth terminal, within equipment		P
	Class I supply equipment with non-hazardous live output voltage: output circuit not connected to earth		N
	Protective earth conductors correctly coloured	Green/yellow cord used	P
	Equipment with non-detachable mains cord provided with separate protective earth terminal near mains input	Detachable cord used	N
	Protective earth terminal resistant to corrosion		P
	Earth resistance test: $\leq 0.1 \Omega$ at 25 A	0.01 Ω	P
15.3	Terminals for external flexible cords and for permanent connection to the mains supply		
15.3.1	Adequate terminals for connection of permanent wiring	Not permanently connected equipment	N
15.3.2	Reliable connection of non-detachable cords:		
	Not soldered to conductors of a printed circuit board	Detachable cord used	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 equipment		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



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
	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
	Terminals located and shielded: test with 8 mm strand		N
15.4	Devices forming a part of the mains plug		
15.4.1	No undue strain on mains socket-outlets	Cord connected equipment	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



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
16	EXTERNAL FLEXIBLE CORDS		
16.1	Mains cords sheathed type, complying with IEC 60227 for PVC or IEC 60245 for synthetic rubber cords	PVC	P
	Non-detachable cords for Class I have green/yellow core for protective earth	Detachable cord used	N
16.2	Mains cords conductors have adequate cross-sectional area for rated current consumption of the equipment	3 x 0.75 mm ²	P
16.3	a) Flexible cords not complying with 16.1, used for interconnections between separate units of equipment used in combination and carrying hazardous live voltages, have adequate dielectric strength	No such flexible cord used	N
	b) Flexible cords not complying with 16.1, withstand bending and mechanical stress (3.1 of IEC 60227-2)		N
16.4	Flexible cords used for connection between equipment have adequate cross-sectional areas to avoid temperature rise under normal and fault conditions		N
16.5	Adequate strain relief on external flexible cords	Appliance inlet used	N
	Not possible to push cord back into equipment		N
	Strain relief device unlikely to damage flexible cord		N
	For mains cords of Class I equipment, 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
16.7	Transportable musical instruments and amplifiers fitted with detachable cord set with appliance inlet to IEC 60320-1	Appliance inlet used	P
	Transportable musical instruments and amplifiers fitted with detachable cord sets or with means of stowage to protect the cord		N



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict

17	ELECTRICAL CONNECTIONS AND MECHANICAL FIXINGS		
17.1	Torque test to table 20:		P
	- screws into metal: 5 times	Torque applied: 2.5 Nm	P
	- screws into non-metallic material: 10 times		N
17.2	Correct introduction into female threads in non-metallic material		N
17.3	Cover fixing screws: captive		N
	Non-captive fixing screws: no hazard when replaced by a screw whose length is 10 times its diameter	Checked by Øx10 screw	P
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		P

18	MECHANICAL STRENGTH OF PICTURE TUBES AND PROTECTION AGAINST THE EFFECTS OF IMPLOSION		
	Picture tube separately approved to IEC 61965:	No such component	N
	Picture tube separately approved to 18.1		N
18.1	Picture tubes > 16 cm intrinsically protected		N
	Non-intrinsically protected tubes > 16 cm used with protective screen		N
18.2	Intrinsically protected tubes: tests on 12 samples		N
18.2.1	Samples subject to ageing: 6		
18.2.2	Samples subject to implosion test: 6		



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
18.2.3	Samples subject to mechanical strength test (steel ball): 6		N
18.3	Non-intrinsically protected tubes tested to 18.3		N

19	STABILITY AND MECHANICAL HAZARDS		
	Mass of the equipment exceeding 7 kg		P
	Apparatus intended to be fastened in place – suitable instructions		N
19.1	Test on a plane, inclined at 10° to the horizontal		P
19.2	100 N force applied vertically downwards		P
19.3	Apparatus mass \geq 25 kg or height \geq 1 m or supplied with cart or stand		P
19.4	Edges or corners not hazardous		P
19.5	Glass surfaces with an area exceeding 0,1 m ² or maximum dimension > 450 mm, pass the test of 19.5.1		N
19.6	Wall or ceiling mountings adequate		N



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
20	RESISTANCE TO FIRE		
20.1	Electrical components and mechanical parts		
	a) Exemption for components contained in an enclosure of material V-0 to IEC 60707 with openings not exceeding 1 mm in width		N
	b) Exemption for small components as defined in 20.1		N
20.1.1	Electrical components meet the requirements of Clause 14 or 20.1.4		P
20.1.2	Insulation of internal wiring working at voltages > 4 kV or leaving an internal fire enclosure, not contributing to the spread of fire	No such high voltage exist	N
20.1.3	Material of printed circuit boards on which the available power exceeds 15 W at a voltage between 50 V and 400 V (peak) a.c. or d.c. meets V-1 or better to IEC60707, unless used in a fire enclosure		N
	Material of printed circuit boards on which the available power exceeds 15 W at a voltage >400 V (peak) a.c. or d.c. meets V-0 to IEC 60707		N
20.1.4	Components and parts not covered by 20.1.1, 20.1.2 and 20.1.3 (other than fire enclosures) mounted nearer to a potential ignition source than the distances in Table 21 comply with the relevant flammability category in Table 21	(see appended table)	P
	Components and parts as above but shielded from a potential ignition source, with the barrier area in accordance with Table 21 and fig. 13		N
20.2	Fire enclosure		
20.2.1	Potential ignition sources with open circuit voltage > 4 kV (peak) a.c. or d.c. contained in a fire enclosure to V-1		N
20.2.2	Internal fire enclosures with openings not exceeding 1 mm in width and with openings for wires completely filled		N
20.2.3	Requirements of 20.2.1 and 20.2.2 met by an internal fire enclosure		N



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
A	APPENDIX A, ADDITIONAL REQUIREMENTS FOR APPARATUS WITH PROTECTION AGAINST SPLASHING WATER		
A.5.1	j) Marked with IPX4 (IEC 60529), 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
B	APPENDIX B, APPARATUS TO BE CONNECTED TO THE TELECOMMUNICATION NETWORKS		
	Complies with IEC 62151 clause 1		N
	Complies with IEC 62151 clause 2		N
	Complies with IEC 62151 clause 3 but with 3.5.4 modified to 2.4.10 of this standard		N
	Complies with IEC 62151 clause 4 but with 4.1.2, 4.1.3 and 4.2.1.2 modified in accordance with annex B of this standard		N
	Complies with IEC 62151 clause 5 but with 5.3.1 modified in accordance with annex B of this standard		N
	Complies with IEC 62151 clause 6		N
	Complies with IEC 62151 clause 7		N
	Complies with IEC 62151 annex A, B and C		N



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
CENELEC COMMON MODIFICATIONS [C], SPECIAL NATIONAL CONDITIONS [S] AND A-DEVIATIONS (NATIONAL DEVIATIONS) [A] (EN 60065:2002)			
3.1	<p>Add the following indent at the end of the list: - exposure to excessive sound pressures from headphones or earphones.</p> <p>NOTE A new method of measurement is described in EN 50332-1, Sound system equipment: Headphones and earphones associated with portable audio equipment - Maximum sound pressure level measurement methodology and limit considerations - Part 1: General method for "one package equipment", and in EN 50332-2, Sound system equipment: Headphones and earphones associated with portable audio equipment - Maximum sound pressure level measurement methodology and limit considerations - Part 2: Guidelines to associate sets with headphones coming from different manufacturers.</p>		Not checked
4.1.1	<p>Replace the text of the note by:</p> <p>NOTE For ROUTINE TEST reference is made to EN 50333.</p>		N
5.1.i)	<p>Add the following note:</p> <p>NOTE For RATED POWER CONSUMPTION measurements of TVs reference is made to EN 60107.</p>		N
6.1	<p>Replace the entire subclause by:</p> <p>Apparatus including a potential source of ionizing radiation shall be so constructed that personal protection against ionizing radiation is provided under normal operating conditions and under fault conditions.</p> <p><i>Compliance is checked by measurement under the following conditions: In addition to the normal operating conditions, all controls adjustable from the outside BY HAND, by any object such as a tool or a coin, and those internal adjustments or pre-sets which are not locked in a reliable manner, are adjusted so as to give maximum radiation whilst maintaining an intelligible picture for 1 h, at the end of which the measurement is made.</i></p> <p>NOTE Soldered joints and paint lockings are examples of adequate locking.</p>		N



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
6.1 (Cont)	<p><i>The amount of ionizing radiation is regulated by European Council Directive 96/29/Euratom of 13 May 1996. This directive requires that at any point 10 cm from the outer surface of the apparatus, the dose-rate shall not exceed 1μ Sv/h (0,1 mR/h) taking account of the background level.</i></p> <p><i>Moreover, the measurement shall be made under fault conditions causing an increase of the high-voltage, provided an intelligible picture is maintained for 1 h, at the end of which the measurement is made.</i></p> <p><i>A picture is considered to be intelligible if the following conditions are met:</i></p> <ul style="list-style-type: none"> - a scanning amplitude of at least 70 % of the usable screen width; - a minimum luminance of 50 cd/m² with locked blank raster provided by a test generator; - a horizontal resolution corresponding to at least 1,5 MHz in the centre, with a similar vertical degradation; - not more than one flashover per 5 min. 		N
13.3.1	Delete note 4.		N
14	Delete note 4 and note 5.		N
15.1.1	Delete note 1 and note 2.		N
15.2	Delete note 2.		N
16.1	Delete note 1.		N
16.2	Delete the note.		N
20	Delete note 2.		N
Annex B	Replace note 1 by: In the CENELEC countries listed in IEC 62151, special national conditions apply.		N
Annex G	Delete the note.		N
Annex J.2	Delete the notes of Table J.1		N
Annex N	Add after the introduction: For ROUTINE TEST reference is made to EN 50333.		N



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
Biblio- graphy	<p>Add the following standards: EN 50332-1:2000, <i>Sound system equipment: Headphones and earphones associated with portable audio equipment — Maximum sound pressure level measurement methodology and limit considerations — Part 1: General method for "one package equipment"</i> prEN 50332-2 (under consideration), <i>Sound system equipment: Headphones and earphones associated with portable audio equipment — Maximum sound pressure level measurement methodology and limit considerations — Part 2:</i> <i>Guidelines to associate sets with headphones coming from different manufacturers</i></p>		P
	<p>Add the following notes for the standards indicated: IEC 60130 NOTE Parts 9 and 17:1998 are harmonized as ENs (not modified). IEC 60169 NOTE Partly harmonized in the EN 60169/HD 134 series (not modified). IEC 60173 NOTE Harmonized as HD 27 S1:1978 (not modified). IEC 60335-2-56 NOTE Harmonized as EN 60335-2-56:1997 (not modified). IEC 60335-2-82 NOTE Harmonized as EN 60335-2-82:2000 (not modified). IEC 60695 NOTE Harmonized as EN 60695 series (not modified). IEC 61040 NOTE Harmonized as EN 61040:1992 (not modified). IEC 61558-2-1 NOTE Harmonized as EN 61558-2-1:1997 (not modified). IEC 61558-2-4 NOTE Harmonized as EN 61558-2-4:1997 (not modified). IEC 61558-2-6 NOTE Harmonized as EN 61558-2-6:1997 (not modified).</p>		P



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict

Annex ZA (normative)	Other international publications quoted in this standard with the references of the relevant European publications					P
	Publication	Date	Title	EN/HD	Date	
	-	-	Audio, video and similar electronic apparatus – Routine electrical safety testing in production	EN 50333	2001	
	IEC 60027	series	Letter symbols to be used in electrical Technology	HD 245	series	
	IEC 60038 (mod)	1983	IEC standard voltages ¹⁾	HD 472 S1	1989	
	IEC 60068-2-3	1969	Environmental testing Part 2: Tests - Test Ca: Damp heat, steady state	HD 323.2.3 S2 ²⁾	1987	
	IEC 60068-2-6 + corr. March	1995 1995	Part 2: Tests -Test Fc: Vibration (sinusoidal)	EN 60068-2-6	1995	
	IEC 60068-2-32	1975	Part 2: Tests - Test Ed: Free fall	EN 60068-2-32 ³⁾	1993	
	IEC 60068-2-75	1997	Part 2: Tests - Test Eh: Hammer tests	EN 60068-2-75	1997	
	IEC 60085	1984	Thermal evaluation and classification of electrical insulation	HD 566 S1	1990	
	IEC 60107	series	Methods of measurement on receivers for television broadcast transmissions	EN 60107	series	
	IEC 60112	1979	Method for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions	HD 214 S2	1980	
	IEC 60127	series	Miniature fuses	EN 60127	series	
	IEC 60167	1964	Methods of test for the determination of the Insulation resistance of solid insulating materials	HD 568 S1	1990	
	IEC 60216	series	Guide for the determination of thermal endurance Properties of electrical insulating materials	HD 611/ EN 60216	series	
	IEC 60227 ⁴⁾	series	Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V	HD 21	series	
	¹⁾ The title of HD 472 S1 is: Nominal voltages for low voltage public electricity supply systems. ²⁾ HD 323.2.3 S2 includes A1:1984 to IEC 60068-2-3. ³⁾ EN 60068-2-32 includes A2:1990 to IEC 60068-2-32. ⁴⁾ The HD 21 series is related to but not directly equivalent to the IEC 60227 series.					



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict

(Cont)	Publication	Date	Title	EN/HD	Date	P
	IEC 60245 ⁵⁾	series	Rubber insulated cables - Rated voltages up to and including 450/750 V	HD 22	series	
	IEC 60249-2	series	Base materials for printed circuits Part 2: Specifications	EN 60249-2	series	
	IEC 60268-1	1985	Sound system equipment Part 1: General	HD 483.1 S2 ⁶⁾	1989	
	IEC 60317	series	Specifications for particular types of winding wires	EN 60317	series	
	IEC 60320	series	Appliance couplers for household and similar general purposes	EN 60320	series	
	IEC 60335-1 (mod)	2001	Safety of household and similar electrical appliances Part 1: General requirements	EN 60335-1	- ⁷⁾	
	IEC 60384-1	1982	Fixed capacitors for use in electronic equipment Part 1: Generic specification	EN 130000 ⁸⁾	1993	
	IEC 60384-14 A1	1993 1995	Fixed capacitors for use in electronic equipment Part 14: Sectional specification: Fixed capacitors for electromagnetic interference suppression and connection to the supply mains	EN 132400 ⁹⁾	1994	
	IEC 60417	series	Graphical symbols for use on equipment	EN 60417	series	
	IEC 60454	series	Specifications for pressure-sensitive adhesive tapes for electrical purposes	EN 60454	series	
	IEC 60529	1989	Degrees of protection provided by enclosures (IP Code)	EN 60529 + corr. May	1991 1993	
	IEC 60664-1 (mod)	1992	Insulation coordination for equipment within low-voltage systems Part 1: Principles, requirements and tests	HD 625.1 S1 + corr. November	1996 1996	
	IEC 60664-3	1992	Part 3: Use of coatings to achieve insulation coordination of printed board assemblies	HD 625.3 S1	1997	
	IEC 60691	1993	Thermal links - Requirements and application guide	EN 60691 ¹⁰⁾	1995	
	IEC 60695-2-2	1991	Fire hazard testing Part 2-2: Test methods - Needle-flame test	EN 60695-2-2	1994	
	<p>⁵⁾ The HD 22 series is related to but not directly equivalent to the IEC 60245 series.</p> <p>⁶⁾ HD 483.1 S2 includes A1:1988 to IEC 60268-1.</p> <p>⁷⁾ to be published.</p> <p>⁸⁾ EN 130000:1993 (which was related to but not directly equivalent to IEC 60384-1:1982) is superseded by EN 60384-1:2001, which is based on IEC 60384-1:1999, mod.</p> <p>⁹⁾ EN 132400:1994 is related to but not directly equivalent to IEC 60384-14:1993 + A1:1995.</p> <p>¹⁰⁾ EN 60691 includes A1:1995 to IEC 60691.</p>					



IEC 60065						
Clause	Requirement – Test		Result - Remark		Verdict	
(Cont)	Publication	Date	Title	EN/HD	Date	P
	IEC 60695-11-10	1999	Part 11-10: Test flames – 50 W horizontal and vertical flame test methods	EN 60695-11-10	1999	
	IEC 60707	1999	Flammability of solid non-metallic materials when exposed to flame sources – List of test methods	EN 60707	1999	
	IEC 60730 (mod)	series	Automatic electrical controls for household and similar use	EN 60730	series	
	IEC 60825-1 corr. December A1	1993 1994 1997	Safety of laser products Part 1: Equipment classification, requirements and user's guide	EN 60825-1 + corr. February + A11	1994 1995 1996	
	A2	2001		+ corr. July A2	1997 2001	
	IEC 60851-3	1996	Winding wires - Test methods Part 3: Mechanical properties	EN 60851-3	1996	
	IEC 60851-5	1996	Part 5: Electrical properties	EN 60851-5	1996	
	IEC 60851-6	1996	Part 6: Thermal properties	EN 60851-6	1996	
	IEC 60884	series	Plugs and socket-outlets for household and similar purposes	-	-	
	IEC 60885-1	1987	Electrical test methods for electric cables Part 1: Electrical tests for cables, cords and wires for voltages up to and including 450/750 V	-	-	
	IEC 60906	series	IEC system of plugs and socket-outlets for household and similar purposes	-	-	
	IEC 60950 (mod) + corr. January	1999 2000	Safety of information technology equipment	EN 60950 ¹¹⁾ + corr. February	2000 2002	
	IEC 60990	1999	Methods of measurement of touch-current and protective conductor current	EN 60990	1999	
	IEC 60998-2-2	1991	Connecting devices for low-voltage circuits for household and similar purposes Part 2-2: Particular requirements for connecting devices as separate entities with screwless-type clamping units	EN 60998-2-2	1993	
	IEC 60999-1	1999	Connecting devices - Safety requirements for screw -type and screwless-type clamping units Part 1: General requirements and particular requirements for clamping units for conductors from 0,2mm ² up to 35 mm ² (included)	EN 60999-1	2000	
	IEC 61032	1997	Protection of persons and equipment by enclosures Probes for verification	EN 61032	1998	
	¹¹⁾ EN 60950 is superseded by EN 60950-1:2001 (IEC 60950-1:2001, mod.).					



IEC 60065						
Clause	Requirement – Test			Result - Remark	Verdict	
(Cont)	Publication	Date	Title	EN/HD	Date	P
	IEC 61051-2	1991	Varistors for use in electronic equipment Part 2: Sectional specification for surge suppression varistors	-	-	
	IEC 61058-1	1996	Switches for appliances Part 1: General requirements	- ¹²⁾	-	
	IEC/TR2 61149	1995	Guide for safe handling and operation of mobile radio equipment	-	-	
	IEC 61260	1995	Electroacoustics - Octave-band and fractional-octave-band filters	EN 61260	1995	
	IEC 61293	1994	Marking of electrical equipment with ratings related to electrical supply - Safety requirements	EN 61293	1994	
	IEC 61558-1 (mod)	1997	Safety of power transformers, power supply units and similar	EN 61558-1	1997	
	A1	1998	Part 1: General requirements and tests	A1	1998	
	IEC 61558-2-17	1997	Part 2-17: Particular requirements for transformers for switch mode power supplies	EN 61558-2-17	1997	
	IEC 61965	2000	Mechanical safety of cathode ray tubes	EN 61965	2001	
	IEC 62151	2000	Safety of equipment electrically connected to a telecommunication network	-	-	
	IEC Guide 104	1997	The preparation of safety publications and the use of basic safety publications and group safety publications	-	-	
	ISO 262	1973	ISO general purpose metric screw threads - Selected sizes for screws, bolts and nuts	-	-	
	ISO 306	1994	Plastics - Thermoplastic materials - Determination of Vicat softening temperature (VST)	-	-	
	ISO 7000	1989	Graphical symbols for use on equipment - Index and synopsis	-	-	
	ITU-T Recommendation K.17	1988	Tests on power-fed repeaters using solid-state devices in order to check the arrangements for protection from external interference	-	-	
	ITU-T Recommendation K.21	1996	Resistibility of subscriber's terminal to overvoltages and overcurrents	-	-	
	12) IEC 61058-1:2000 + A1:2001, mod., are harmonized as EN 61058-1:2002.					



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict

National differences GERMANY			DE 03
5	<p>The following markings are required:</p> <p>a) In case of intrinsically ionizing radiation safe cathode-ray tubes with accelerating voltages between 20 kV and 30 kV:</p> <ul style="list-style-type: none"> - On the cathode-ray tube itself the wording: Eigensichere Kathodenstrahlröhre nach Anlage III Röntgen-verordnung - Inside the apparatus: the maximum allowed accelerating voltage in kV, and the maximum allowed beam current in mA. - On the outer of the apparatus: a notice in German language that produced X-rays are sufficiently shielded by the intrinsically safe cathode-ray tube. <p>b) In case of approval of the whole TV receiver with an accelerating voltage exceeding 20 kV:</p> <ul style="list-style-type: none"> - On the outer of the apparatus: the licence number .../.../Rö , and the following text: Die in diesem Gerät entstehende Röntgenstrahlung ist ausreichend abgeschirmt. Beschleunigungsspannung: max: ... kV. - Supplied with the apparatus: a copy of the "Zulassungsschein", together with the notices required there. <p>c) In case of TV receivers with accelerating voltages not exceeding 20 kV: Die in diesem Gerät entstehende Röntgenstrahlung ist ausreichend abgeschirmt. Beschleunigungsspannung: max: ... kV.</p> <p><i>Justification:</i> German ministerial decree against ionizing radiation (Röntgenverordnung), dated 1987-01-08.</p> <p>NOTE The German ministerial decree (Röntgenverordnung) is under revision.</p>		Not checked



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
	National differences DENMARK		
		DK 03	
2.6.1	<p>The following is added: Certain types of CLASS I apparatus, see 15.1.1, may be provided with a plug not establishing earthing continuity when inserted in Danish socketoutlets <i>Justification:</i> Heavy Current Regulations, Section 107</p>		Not checked
15.1.1	<p>To the first paragraph the following is added: In Denmark, supply cords of single phase appliances having a rated current not exceeding 13 A shall be provided with a plug according to the Heavy Current Regulations Section 107-2-D1. Appliances of CLASS I provided with socket-outlets with earth contact or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with the Heavy Current Regulations, Section 107-2-D1 standard sheet DK 2-1a.</p> <p>To the second paragraph the following is added: Socket outlets intended for providing power to CLASS II apparatus with a rated current of 2,5 A shall have the following dimensions: See EN 60065:2002 OR CB Bulletin</p> <p>Other dimensions shall be in compliance with the Heavy Current Regulations, Section 107-2-D1, Standard Sheet DKA 1-3 for portable socket outlets. Shutters are not required</p> <p>To the third paragraph the following is added: Mains socket-outlets with earthing contact shall be in compliance with HeavyCurrent Regulations Section 107-2-D1, Standard sheet DK 1-3a, DK 1-5a or DK 1-7a <i>Justification:</i> Heavy Current Regulations, Section 107</p>		Not checked



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
	National differences NORWAY		
		NO 03	
13.3.1	<p>To the second paragraph the following is added: 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 230 V in case of a single earth fault.</p> <p><i>Justification:</i> Based on a use in Norway of an IT power distribution system where the neutral is not provided</p>		Not checked
15.1.1	<p>Mains socket-outlets mounted on CLASS II apparatus shall comply with the specifications given in CEE Publ. 7 as far as applicable, with the following amendments:</p> <p>§ 8 Dimensions a 2,5 A 250 V two-pole socket-outlets for electronic apparatus shall comply with the enclosed Standard Sheet I.</p> <p>See EN 60065:2002 OR CB Bulletin Other dimensions according to CEE Publication 7 Standard Sheet I "Portable Single-Way Socket-Outlets".</p> <p>§ 24 Mechanical strength a 2,5 A, 250 V socket-outlets for CLASS II electronic apparatus are tested as specified in 12.1.3 of EN 60065. Also the protecting rim shall be tested</p> <p><i>Justification:</i> Act of 24 May 1929 relating to supervision of electrical installation (TEA 1929/FEL 1998).</p>		Not checked
J.2	<p>After Table J.1 the following is added: 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 230 V in case of a single earth fault.</p> <p><i>Justification:</i> Based on a use in Norway of an IT power distribution system where the neutral is not provided</p>		Not checked



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
	National differences UNITED KINGDOM		
		GB 03	
15.1.1	<p>Apparatus which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to BS 1363 by means of that flexible cable or cord and plug shall be fitted with a "standard plug" in accordance with Statutory Instrument 1768: 1994: The Plugs and Sockets etc. (Safety) Regulations 1994, unless exempted by those Regulations.</p> <p>NOTE "Standard plug" is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug.</p> <p><i>Justification:</i></p> <p>SI 1768: 1994</p>		Not checked



IEC 60065					
Clause	Requirement – Test	Result - Remark			Verdict
7.1	TABLE: temperature rise measurements				P
	Power consumption in the OFF	0 W			—
	Position of the functional switch (W)	—			—
Operating conditions					
1/8 of maximum non-clipping output power with standard signal input					
	Un (V)	In (A)	Pn (W)	Pout (W)	
	264.0	0.85	165	28	
	240	0.87	163	27	
Fuse-link current : I(main fuse) = 0.85A, I(FS3) = I(FS4) = 2.05A, I(FS1) = I(FS2) = 0.215A					
	Loudspeaker impedance (O)	4			—
	Several loudspeaker systems	4 O x 1			—
	Marking of loudspeaker terminals	—			—
Monitored point:		dT (K)	Limit dT (K)		
Winding surface of mains transformer		62	85		
Primary lead wire of mains transformer		37	60		
Secondary lead wire of mains transformer		38	60		
Power cord		22	60		
Heat sink (inside apparatus)		39	For reference		
PCB Surface (near DR1)		44	85		
PCB Surface (near R19)		20	85		
PCB Surface (near TR16)		43	85		
PCB Surface (near TR11)		43	85		
PCB Surface (near TR15)		18	85		
PCB Surface (near D9)		34	85		
Enclosure (top) (non-metallic)		12	60		
Enclosure (side) (non-metallic)		5	60		
Enclosure (rear) (metallic)		19	40		
Enclosure (front) (metallic)		17	40		
Winding temperature rise measurements					
	Ambient temperature t1 (°C)	22			—
	Ambient temperature t2 (°C)	21			—
Temperature rise dT of winding:		R ₁ (O)	R ₂ (O)	dT (K)	Limit dT (K)
Primary winding of mains transformer		12.1	14.9	61	85
Polyurethane resins					



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict

7.2	TABLE: softening temperature of thermoplastics			–
Temperature T of part	T - normal conditions (°C)	T - fault conditions (°C)	T softening (°C)	
–	–	–	–	
–	–	–	–	

10.3	TABLE: insulation resistance measurements		P
Insulation resistance R between:	R (MO)	Required R (MO)	
Between mains poles (primary fuse disconnected)	> 100	2	
Between parts separated by basic or supplementary insulation	>100	2	
Between parts separated by double or reinforced insulation	>100	4	

10.3	TABLE: electric strength measurements		P
Test voltage applied between:	Test voltage (Vpeak)	Breakdown	
Mains poles (primary fuse disconnected)	2120	No	
Between parts separated by basic or supplementary insulation	2120	No	
Between parts separated by double or reinforced insulation	4240	No	



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
11.2	TABLE: summary of fault condition tests		P
	Voltage (V) 0,9 or 1,1 times rated voltage	AC 220 – 240V	—
	Ambient temperature (°C)	21.2 °C – 23.6 °C	—
Monitored point: Under fault conditions specified below		dT (K)	Limit dT (K)
100% of max. non-clipping output power Un (V) = 264; Pn W = 490; In mA = 2050		--	--
Iron core of mains transformer		--	--
Winding surface of mains transformer		98	150
Primary lead wire		59	100
PCB Surface (near DR1)		109	110
PCB Surface (near TR16)		44	110
Enclosure		19	65
Result: No Hazard; Test time = 2.5 hrs		--	--
Monitored point: Under fault conditions specified below		dT (K)	Limit dT (K)
Lock fan Un (V) = 264; Pn W = 170; In mA = 870		--	--
Iron core of mains transformer		--	--
Winding surface of mains transformer		32	150
Primary lead wire		28	100
PCB Surface (near TR11)		107	110
PCB Surface (near TR16)		95	110
Enclosure		26	65
Result: No Hazard; Test time = 2 hrs		--	--



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
	Monitored point: Under fault conditions specified below	dT (K)	Limit dT (K)
	Short audio signal output terminal Un (V) = 264; Pn W = 11; In mA = 129	--	--
	Iron core of mains transformer	--	--
	Winding surface of mains transformer	27	150
	Primary lead wire	20	100
	PCB Surface (near DR1)	44	110
	PCB Surface (near TR11)	43	110
	Enclosure	16	65
	Result: No Hazard; Test time = 1 hr	--	--
	Monitored point: Under fault conditions specified below	dT (K)	Limit dT (K)
	Short TR12 C-E Un (V) = 264; Pn W = 600; In mA = 2460	--	--
	Iron core of mains transformer	--	--
	Winding surface of mains transformer	32	150
	Primary lead wire	18	100
	PCB Surface (near DR1)	85	110
	PCB Surface (near TR16)	41	110
	Enclosure	14	65
	Result: R19 opened, No Hazard; Test time = 1 hr	--	--
	Monitored point: Under fault conditions specified below	dT (K)	Limit dT (K)
	Short TR16 C-B Un (V) = 264; Pn W = 10.8; In mA = 158	--	--
	Iron core of mains transformer	--	--
	Winding surface of mains transformer	11	150
	Primary lead wire	9	100
	PCB Surface (near TR11)	37	110
	PCB Surface (near TR16)	35	110
	Enclosure	5	65
	Result: TR11, TR16 were opened, No Hazard; Test time = 0.5 hr	--	--



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
Monitored point: Under fault conditions specified below		dT (K)	Limit dT (K)
Short TR16 C-E Un (V) = 264;Pn W = 11.4;In mA = 145		--	--
Iron core of mains transformer		--	--
Winding surface of mains transformer		17	150
Primary lead wire		11	100
PCB Surface (near TR11)		46	110
PCB Surface (near DR1)		42	110
Enclosure		6	65
Result: TR11, TR16 were opened, No Hazard; Test time = 0.5 hr		--	--
Monitored point: Under fault conditions specified below		dT (K)	Limit dT (K)
Short C16 Un (V) = 264;Pn W = --;In mA = --		--	--
Fuse of FS3 was opened. Fuse of FS4 was opened. Current of Fuse link of FS3 when opened was 14A. Current of Fuse link of FS4 when opened was 14A. Marking on the current fuse of FS3 was 5A. Marking on the current fuse of FS4 was 5A.		--	--
Monitored point: Under fault conditions specified below		dT (K)	Limit dT (K)
Short C16 Un (V) = 207;Pn W = --;In mA = --		--	--
Fuse of FS3 was opened. Fuse of FS4 was opened. Current of Fuse link of FS3 when opened was 15A. Current of Fuse link of FS4 when opened was 15A. Marking on the current fuse of FS3 was 5A. Marking on the current fuse of FS4 was 5A.		--	--



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict

Monitored point: Under fault conditions specified below		dT (K)	Limit dT (K)
Short DR1 Un (V) = 264; Pn W = --; In mA = --		--	--
Fuse of FS3 was opened. Fuse of FS4 was opened. Current of Fuse link of FS3 when opened was 13A. Current of Fuse link of FS4 when opened was 13A. Marking on the current fuse of FS3 was 5A. Marking on the current fuse of FS4 was 5A.		--	--
Monitored point: Under fault conditions specified below		dT (K)	Limit dT (K)
Short DR1 Un (V) = 207; Pn W = --; In mA = --		--	--
Fuse of FS3 was opened. Fuse of FS4 was opened. Current of Fuse link of FS3 when opened was 14A. Current of Fuse link of FS4 when opened was 14A. Marking on the current fuse of FS3 was 5A. Marking on the current fuse of FS4 was 5A.		--	--
Monitored point: Under fault conditions specified below		dT (K)	Limit dT (K)
Short D7 Un (V) = 264; Pn W = --; In mA = --		--	--
Fuse of FS1 was opened. Fuse of FS2 was opened. Current of Fuse link of FS1 when opened was 3A. Current of Fuse link of FS2 when opened was 3A. Marking on the current fuse of FS1 was 1A. Marking on the current fuse of FS2 was 1A.		--	--



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict

Monitored point: Under fault conditions specified below		dT (K)	Limit dT (K)
Short D7 Un (V) = 207; Pn W = --; In mA = --		--	--
Fuse of FS1 was opened. Fuse of FS2 was opened. Current of Fuse link of FS1 when opened was 4A. Current of Fuse link of FS2 when opened was 4A. Marking on the current fuse of FS1 was 1A. Marking on the current fuse of FS2 was 1A.		--	--
Monitored point: Under fault conditions specified below		dT (K)	Limit dT (K)
Short C15 Un (V) = 264; Pn W = --; In mA = --		--	--
Fuse of FS1 was opened. Fuse of FS2 was opened. Current of Fuse link of FS1 when opened was 4A. Current of Fuse link of FS2 when opened was 4A. Marking on the current fuse of FS1 was 1A. Marking on the current fuse of FS2 was 1A.		--	--
Monitored point: Under fault conditions specified below		dT (K)	Limit dT (K)
Short C15 Un (V) = 207; Pn W = --; In mA = --		--	--
Fuse of FS1 was opened. Fuse of FS2 was opened. Current of Fuse link of FS1 when opened was 4.5A. Current of Fuse link of FS2 when opened was 4.5A. Marking on the current fuse of FS1 was 1A. Marking on the current fuse of FS2 was 1A.		--	--



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict

14	TABLE: list of critical components and materials					P
Component	Manufacturer/ trademark	Type/model	Value / rating	Standard	Approval/ Reference	
Power cordset	Lian Dung Electric Wire Co., Ltd.	LT-312 H05VV-F LT-501	AC 250V 16A 3 x 0.75 mm ² AC 250V 10A	IEC 60799	VDE	
Power Cord (Alternative)	Shenzhen Tongyuan Ind., Co., Ltd.	H05VV-F	3 x 0.75 mm ²	IEC 60227	VDE	
Power Cord (Alternative)	Lucky United Electric Wire & Cable Co., Ltd.	H05VV-F	3 x 0.75 mm ²	IEC 60227	VDE	
Power Cordset (China Plug)	Dongguan City Lian Cheng Elect Ind Co., Ltd.	RVV-3P RVV LS0203	AC 250V 10A 3 x 0.75 mm ² AC 250V 10A	GB2099.1 GB1002 GB5023.5 GB17465.1	CQC	
Appliance Inlet	Rong Feng Industrial Co., Ltd.	RF-2004	AC 250V 10A	IEC 60320	VDE	
Fuse inside appliance inlet	Walter Electronic Co., Ltd.	TSD 5 x 20 mm	AC 250V T3.15AL	IEC 60127	VDE	
Switch	Light Country Co., Ltd.	R5	AC 250V 15A	IEC61058	SEMKO	
Plastic material of mains switch	LG Chemical Ltd.	AF-310G	V-0	IEC 60707	Tested in appliance	
Mains Transformer	Top Cheers Electric Mfg., Co.(China)	EB180-230	AC 230V 50/60Hz	IEC 60065	Tested in appliance	
Thermal cut-out used inside the mains transformer	SEKI Controls Co., Ltd.	ST-22	AC 250V 1A 130 °C	IEC 60730	VDE	

¹⁾ an asterisk indicates a mark which assures the agreed level of surveillance



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict

14	TABLE: list of critical components and materials (Cont'd)					P
Component	Manufacturer/ trademark	Type/model	Value / rating	Standard	Approval/ Reference	
Thermal cut-out used inside the mains transformer (Alternative)	Texas Instruments Holland BV	17AM	AC 250V 9A 130 °C	IEC 60730	KEMA	
Insulation tape between primary winding and secondary winding	Toray Industries Inc. Film Div.	Lumirror X10	VTM-2	IEC 60707	Tested in appliance	
Plastic material of wire connector	Grand Pacific Petrochemical Corp.	D-1000	V-0	IEC 60707	Tested in appliance	
Fuse (FS1, FS2)	Walter Electronic Co., Ltd.	TSD 5 x 20 mm	AC 250V T1AL	IEC 60127	VDE	
Fuse (FS3, FS4)	Walter Electronic Co., Ltd.	TSD 5 x 20 mm	AC 250V T5AL	IEC 60127	VDE	
Thermal cut-out mounted on the heat sink	Light Country Co., Ltd.	T-24	AC 250V 10A 125 °C	IEC 60730-1	VDE	
All PCB	Long Chang Printed Circuit Ltd.	LC-04V0	V-0	IEC 60707	Tested in appliance	
All PCB (Alternative)	EISO Enterprise Co., Ltd.	5	V-0	IEC 60707	Tested in appliance	

¹⁾ an asterisk indicates a mark which assures the agreed level of surveillance



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
	National differences CHINA (IEC 60065, 5th ed. + Am. No 1, 2 and 3)		
	Clauses 4 and 15		01
4	General Test Condition		P
4.2.2	GB8898 Sub-clause 4.2.2: Test voltage is 0.9 times or 1.1 times rated voltage of the equipment, which of the equipment used in China shall cover 220V ± 10%, 50Hz		
15	Terminal		P
15.1.1	The chinese national standard for Plugs is GB1002-1996, which is not equivalent with IEC 60083		





Photo No. 1

Title: Front view(EB 180H)



Photo No. 2

Title: Front view(EB 12- 180)





Photo No.: 3

Title: Front view(EB 15-180)



Photo No.: 4

Title: Rear view



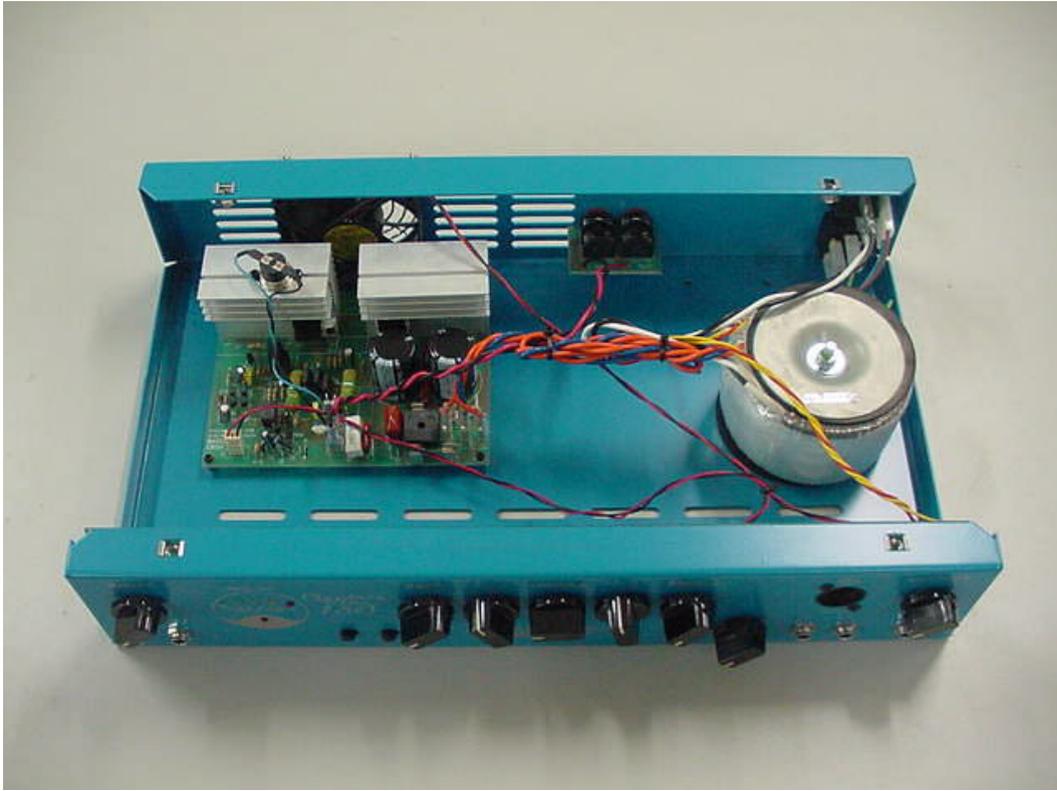


Photo No.: 5

Title: Internal view



Photo No.: 6

Title: Internal view





Photo No.: 7

Title: Mains transformer



Photo No.: 8

Title: Mains transformer





Photo No.: 9

Title: Thermal Cut-off

