TEST REPORT

IEC 60 065

Audio, video and similar electronic apparatus Safety requirements

Report Reference No. ..... :	SEC-07-38
Tested by (+ signature)..... :	wangxin
Approved by (+ signature) ..... :	wangying
Date of issue ..... :	2007-09-18
Contents ..... :	30 pages
Testing laboratory Name..... :	Safety and EMC Testing Center of Electronic Industry
Address ..... :	No. 1 Andingmen Dongdajie Beijing China
Testing location ..... :	as above
Client Name..... :	Gembird Electronics Ltd.
Address ..... :	2F, B Bulding, Shifeng Science and technology Park, Huaning Road, Xinwei Village Dalang Street, Longhua, Bao An, Shenzhen, China
..... :	
Standard..... :	IEC 60065_2001
Test procedure ..... :	CB-scheme
Non-standard test method ..... :	N.A.
Test Report Form/blank test report	
Test Report Form No. ..... :	IEC60065D
TRF originator. ..... :	BEAB
Master TRF ..... :	reference No. 60065/2001

Test item Description ..... :	Multimedia Speaker 2.1 system
Trademark..... :	Gembird
Model and/or type reference.....:	WCS-222
Manufacturer ..... :	Gembird Electronics Ltd.
Address…….....	2F, B Bulding, Shifeng Science and technology Park, Huaning Road, Xinwei Village Dalang Street, Longhua, Bao An, Shenzhen, China
Factory……:	Gembird Electronics Ltd.
Address……..:	2F, B Bulding, Shifeng Science and technology Park, Huaning Road, Xinwei Village Dalang Street, Longhua, Bao An, Shenzhen, China
Rating(s)..... :	～220-240V,50/60Hz,18W+10W*2
..... :	

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 ..... : 2007-08-13

Date(s) of performance of test.....: 2007-08-20 to 2007-09-14

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 IECEE 02.

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

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

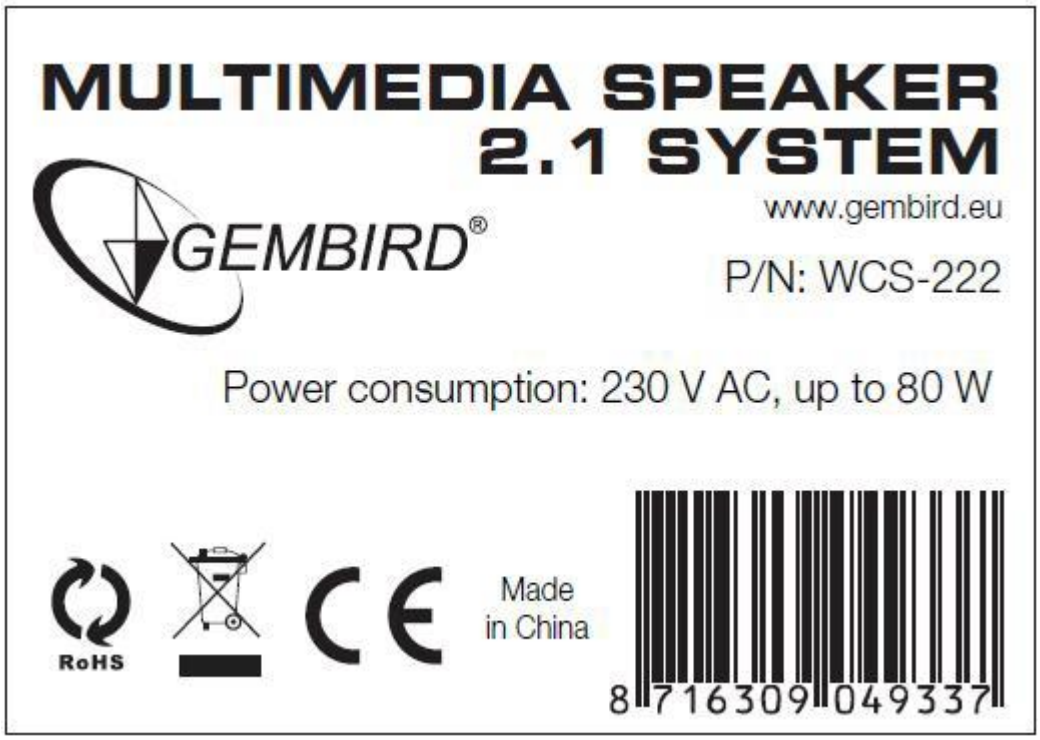
Summary of Testing and Conclusions

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

Additional information

1. The model name is WCS-222
2. All tests were performed on model WCS-222 to represent the other similar models.
3. Power supply cord set (except VDE certificate, see appended table 14) was not check in this report. Compliance has to be checked at final installation.

Copy of marking plate



IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
3	GENERAL REQUIREMENTS		P
	Safety class of the apparatus ..... :	Class II equipment	P
4	GENERAL CONDITIONS OF TESTS		P
4.1.4	Ventilation instructions require the use of the test box	According to instruction	P
5	MARKING		P
	Comprehensible and easily discernible	At the rear of the enclosure	P
	Permanent durability against water and petroleum spirit	Durable against the rubbing test	P
5.1	Identification, maker, model ..... :	Refer to copy of marking plate	P
	Class II symbol if applicable	Double square symbol on label	P
	Rated supply voltage and symbol ..... :	~220-240V	P
	Frequency if safety dependant	50Hz/60Hz	P
	Rated current or power consumption ..... :	Rated power: 18W+10W*2, measurement see table 7.1	P
5.2	Earth terminal	Class II equipment	N
	Hazardous live terminals	No hazardous live terminals	N
	Supply output terminals (other than mains)	No supply output terminals	N
5.3	Use of triangle with exclamation mark	In circuit scheme	P
5.4	Instructions for use		P
5.4.1	Mains powered equipment not exposed to dripping or splashing. Warning concerning objects filled with liquid, etc.	Statement in the user's manual	P
	Hazardous live terminals, instructions for wiring	No hazardous live terminals	N
	Instructions for replacing lithium battery	No lithium battery	N
	Instructions for modem if fitted	No modem	N
	Class I earth connection warning	Class II equipment	N
	Instructions for multimedia system connection		P
	Special stability warning for fixed installation	Not fixed installation	N
5.4.2	Disconnect device: plug/coupler or all-pole mains switch location, accessibility and markings	Statement in the user's manual	P
	Instructions for permanently connected equipment	Not permanently connected equipment	N

IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
6	HAZARDOUS RADIATION		N
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 laser radiation	N
	Emission limits under fault conditions ..... :		N
7	HEATING UNDER NORMAL OPERATING CONDITIONS		P
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	(see appended table)	P
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	(see appended table)	P
7.2	Softening temperature of insulating material supporting parts conductively connected to the mains carrying a current > 0,2 A at least 150 ^{o}C	(see appended table)	N
8	CONSTRUCTIONAL REQUIREMENTS WITH REGARD TO THE PROTECTION AGAINST ELECTRIC SHOCK		P
8.1	Conductive parts covered by lacquer, paper, untreated textile oxide films and beads etc. considered to be bare	Considered	P
8.2	No shock hazard when changing voltage setting device, fuse-links or handling drawers etc.	No hazard	P
8.3	Insulation of hazardous live parts not provided by hygroscopic material	No hygroscopic materials used as insulation	P
8.4	No risk of electric shock following the removal of a cover which can be removed by hand	No a cover which can be removed by hand	N
8.5	Class I equipment	Class II equipment	N
	Basic insulation between hazardous live parts and earthed accessible parts		N
	Resistors bridging basic insulation complying with 14.2.1 a)		N
8.6	Class II equipment and Class II constructions within Class I equipment		P
	Reinforced or double insulation between hazardous live parts and accessible parts	Reinforced or double insulation	P

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Clause	Requirement – Test	Result - Remark	Verdict
	Components bridging reinforced or double insulation complying with 14.1 a) or 14.3	See sub-clause 14.3	P
	Basic and supplementary insulation each being bridged by a capacitor complying with 14.2.1 a)		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 35 V to 71 V (peak) a.c. or 60 V to 120 V d.c. and accessible parts		N
	Reinforced or double insulation between 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		N
	Separation by Class II isolating transformer		N
	Separation by Class I transformer		N
	Separation by earthed conductive part		N
8.8	Basic or supplementary insulation > 0,4 mm (mm) :		P
	Reinforced insulation > 0,4 mm (mm) ..... :	Thickness of bobbin of transformer: 0.9mm	P
	Thin sheet insulation		N
	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		N
8.9	Adequate insulation between internal hazardous live conductors and accessible parts	Inside wire>0.4mm	P
	Adequate insulation between internal hazardous live parts and conductors connected to accessible parts	Inside wire>0.4mm	P
8.10	Double insulation between conductors connected to the mains and accessible parts		P

IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
8.11	Detaching of wires	Connected reliable	P
	No undue reduction of creepages or clearance distances if wires become detached		N
	Vibration test carried out ..... :	No	N
8.12	Adequate cross-sectional area of internal wiring to mains socket-outlets	No mains socket-outlet	N
8.13	Adequate fastening of windows, lenses, lamp covers etc. (pull test 20 N for 10 s)	No windows, lenses, etc	N
8.14	Adequate fastening of covers (pull test 50 N for 10 s)		P
8.15	No risk of damage to the insulation of internal wiring due to hot parts or sharp edges	No risk of damage	P
8.16	Only special supply equipment can be used	Not special supply equipment	N
8.17	Insulated winding wire without additional interleaved insulation	No insulated winding wire	N
8.18	Endurance test as required by 8.17	No insulated winding wire	N
8.19	Disconnection from the mains		P
8.19.1	Disconnect device	Plug and switch	P
	All-pole switch or circuit breaker with >3mm contact separation		N
8.19.2	Mains switch ON indication		P
8.20	Switch not fitted in the mains cord	No switch fitted in mains cord	P
8.21	Bridging components comply with clause 14		N
9	ELECTRIC SHOCK HAZARD UNDER NORMAL OPERATING CONDITIONS		P
9.1	Testing on the outside		P
9.1.1	For voltages >1000 V ac or >1500 V dc complies with clause 13.3.1 for basic insulation		N
9.1.1.1	Touch current measured from terminal devices using the network in annex D ..... :	U1: 1.614Vpeak U2: 0.311Vpeak	P
	Discharge not exceeding 45 µC		P
	Energy of discharge not exceeding 350 mJ		N
9.1.1.2	Test with test finger and test probe	Hazardous live parts not accessible	P

IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
9.1.2	No hazardous live shafts of knobs, handles or levers	No hazardous live shaft	P
9.1.3	Ventilation 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	Won't touch hazardous parts	P
	Terminal devices tested with 1 mm x 100 mm straight wire (1 N); test probe D of IEC 61032	Won't touch hazardous parts	P
9.1.5	Pre-set controls tested with 2 mm x 100 mm test pin (10 N); test probe C of IEC 61032	No pre-set controls	N
9.1.6	No shock hazard due to stored charge on withdrawal of the mains plug; voltage (V) after 2 s :	No capacitor in primary circuit.	N
	If C is not greater than 0,1 µF no test needed		N
9.1.7	Enclosure sufficiently resistant to external force	No damage after below tests	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) .... :		P
9.2	No hazard after removing a cover by hand	No removable cover by hand	N
10	INSULATION REQUIREMENTS		P
10.1	Insulation resistance (MΩ) at least 2 MΩ min. after surge test for basic and 4 MΩ min. for reinforced insulation ..... :		N
10.2	Humidity treatment 48 h or 120 h ..... :	120h 40℃,93%RH	P
10.3	Insulation resistance and dielectric strength	(see appended table)	P
11	FAULT CONDITIONS		P
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	Temperature rise of PCB not exceeding the limits of table 3	N

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Clause	Requirement – Test	Result - Remark	Verdict
	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 cm²		N
	b) Temperature rise of printed circuit boards (PCB) to 20.1.3 up to 300 K for an area not greater than 2 cm² 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	Class II equipment	N
11.2.4	Temperature rise of parts acting as a support or mechanical barrier		P
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	(see appended table)	P
12	MECHANICAL STRENGTH		P
12.1.1	Bump test where mass >7 kg	6.5kg	N
12.1.2	Vibration test		P
12.1.3	Impact hammer test	No damage	P
	Steel ball test	No damage	P
12.1.4	Drop test for portable apparatus where mass < 7 kg		N
12.1.5	Thermoplastic enclosures strain relief test	Main enclosure is made of wood	N
12.2	Fixing of knobs, push buttons, keys and levers		P
12.3	Remote controls with hazardous live parts	No remote control	N
12.4	Drawers (pull test 50 N, 10 s)	No drawer	N
12.5	Antenna coaxial sockets providing isolation	No antenna coaxial sockets	N
12.6	Telescoping or rod antennas construction		N
12.6.1	Telescoping or rod antennas securement		N
13	CLEARANCE AND CREEPAGE DISTANCES		P
13.1	Clearances in accordance with 13.3		P
	Creepage distances in accordance with 13.4		P
13.2	Determination of operating voltage	Considered	P
13.3	Clearances	See appended table	P

IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
13.3.2	Circuits conductively connected to the mains comply with table 8 and, where applicable, table 9		P
13.3.3	Circuits not conductively connected to the mains comply with table 10		P
13.4	Creepage distances	See appended table	P
	Creepage distances greater than table 11 minima		P
13.5	Printed boards		P
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		P
13.5.2	Type B coated printed circuit boards complying with IEC 60664-3 (basic insulation only)	No type B coated printed circuit boards used	N
13.6	Conductive parts along uncemented joints clearances and creepage distances comply with 13.3 and 13.4	None	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	None	N
13.8	Parts filled with insulating compound, meeting the requirements of 8.8	None	N
14	COMPONENTS		P
14.1	Resistors		N
	a) Resistors between hazardous live parts and accessible metal parts	None	N
	b) Resistors, other than between hazardous live parts and accessible parts	None	N
	b) Resistors separately approved ..... :	None	N
14.2	Capacitors and RC units		N
	Capacitors separately approved		N
14.2.1	Y capacitors tested to IEC 60384-14, 2nd edition .. :	None	N
14.2.2	X capacitors tested to IEC 60384-14, 2nd edition .. :	None	N
14.2.3	Capacitors operating at mains frequency but not connected to the mains: tests for X2 ..... :	None	N

IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
14.2.5	Capacitors with volume exceeding 1750 mm³, where short-circuit current exceeds 0,2 A: compliance with IEC60384-1, 4.38 category B or better ..... :	Capacitor with volume is not exceeding 1750mm^3	N
	Capacitors with volume exceeding 1750 mm³, 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 ..... :	No barrier used	N
14.3	Inductors and windings		P
	Comply with IEC 61558-1, IEC 61558-2 (as relevant) and clause 20.1.4		P
14.3.1	Transformers and inductors marked with manufacturer's name and type ..... :	See appended component list	P
	Transformers and inductors separately approved . :		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		P
14.3.4.1	Class II transformers have adequate separation between hazardous live parts and accessible parts (double or reinforced insulation)		P
	Coil formers and partition walls > 0,4 mm	Thickness of formers of transformer: 0.9mm. partition walls:1.1mm	P
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	Class II transformer	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)		P
	Coil formers and partition walls > 0,4 mm	Thickness of formers of transformer:0.9mm partition walls:1.1mm	P

IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
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	Class II transformer	N
	Winding wires connected to protective earth have adequate current-carrying capacity		N
14.4	High voltage components	No such component	N
	High-voltage components and assemblies: U > 4 kV (peak) separately approved		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		P
	Protective devices used within their ratings		P
	External clearances and creepage distances meet requirement of clause 13 for the voltage across the device when opened		P
14.5.1.1	a) Thermal cut-outs separately approved	No thermal cut-outs	N
	b) Thermal cut-outs tested as part of the submission		N
14.5.1.2	a) Thermal links separately approved	See appended component list	P
	b) Thermal links tested as part of the submission		N
14.5.1.3	Thermal devices re-settable by soldering	None	N
14.5.2.1	Fuse-links in the mains circuit according to IEC 60127	See appended component list	P
14.5.2.2	Correct marking of fuse-links adjacent to holder ... :	F1,F0.5A/250V	P
14.5.2.3	Not possible to connect fuses in parallel ..... :		P
14.5.2.4	Not possible to touch hazardous live parts when replacing fuse-links without the use of a tool ..... :		P
14.5.3	PTC-S thermistors comply with IEC 60730-1		N
	PTC-S 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 circuit protectors provided	N
14.6	Switches	See appended component list	P

IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
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) 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	No socket outlet	N
	Socket outlet current marking correct		N
	Safety interlocks	No safety interlock	N
	Safety interlocks to 2.8 of IEC 60950		N
14.8	Voltage setting devices		N
	Voltage setting device not likely to be changed accidentally		N
14.9	Motors	No 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

IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
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	No batteries	N
14.10.1	Batteries mounted with no risk of accumulation of flammable gases		N
14.10.2	No possibility of recharging non-rechargeable batteries		N
14.10.3	Recharging currents and times 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	No optocoupler	N
	Optocouplers comply with Cl. 8		N
	Internal and external dimensions to 13.1. or alternatively 13.6 (jointed insulation)		N
14.12	Surge suppression varistors	No surge suppression varistor	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		P
15.1.1	Mains plug, appliance inlet, interconnection couplers and mains socket-outlet meet the appropriate standard	Mains plug	P
15.1.2	Connectors for antenna, earth, audio, video or data:		P
	No risk of insertion in mains socket-outlets		P
	No risk of insertion into audio or video: outlets marked with the symbol of 5.2	No such symbol of 5.2	N
15.1.3	Output terminals of a.c. adaptors or similar devices not compatible with household mains socket-outlets	No output terminals of a.c adaptors or similar devices	N
15.2	Provision for protective earthing		N

IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
	Accessible conductive parts of Class I equipment reliably connected to earth terminal, within equipment	Class II equipment	N
	Class I supply equipment with non-hazardous live output voltage: output circuit not connected to earth		N
	Protective earth conductors correctly coloured		N
	Equipment with non-detachable mains cord provided with separate protective earth terminal near mains input		N
	Protective earth terminal resistant to corrosion		N
	Earth resistance test: < 0,1 Ω at 25 A ..... :		N
15.3	Terminals for external flexible cords and for permanent connection to the mains supply		P
15.3.1	Adequate terminals for connection of permanent wiring		N
15.3.2	Reliable connection of non-detachable cords:		P
	Not soldered to conductors of a printed circuit board		P
	Adequate clearances and creepage distances between connections should a wire break away		P
	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		P
	Clamping of conductor and insulation if not soldered or held by screws		P
15.3.5	Terminals allow connection of appropriate cross-sectional area of conductors, for the rated current of the equipment		P
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

IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
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		P
	Terminals located and shielded: test with 8 mm strand		N
15.4	Devices forming a part of the mains plug	Not direct-plug equipment	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		P
16.1	Mains cords sheathed type, complying with IEC 60227 for PVC or IEC 60245 for synthetic rubber cords ..... :	Power supply cord set was certificated by VDE	P
	Non-detachable cords for Class I have green/yellow core for protective earth	Class II	N
16.2	Mains cords conductors have adequate cross-sectional area for rated current consumption of the equipment		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 interconnection cord	N
	b) Flexible cords not complying with 16.1, withstand bending and mechanical stress (3.2 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		P
	Not possible to push cord back into equipment		P
	Strain relief device unlikely to damage flexible cord		P
	For mains cords of Class I equipment, hazardous live conductors become taut before earth conductor		N

IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
16.6	Apertures for external flexible cord: no risk of damage to the cord during assembly or movement in use	No risk of damage	P
16.7	Transportable apparatus fitted with detachable cord set with appliance inlet to IEC 60320-1	Not transportable apparatus	N
	Transportable apparatus fitted with detachable cord sets or with means of stowage to protect the cord		N
17	ELECTRICAL CONNECTIONS AND MECHANICAL FIXINGS		P
17.1	Torque test to table 20:		P
	- screws into metal: 5 times		N
	- screws into non-metallic material: 10 times	1.2Nm for cover fixing	P
17.2	Correct introduction into female threads in non-metallic material		P
17.3	Cover fixing screws: captive		P
	Non-captive fixing screws: no hazard when replaced by a screw whose length is 10 times its diameter		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	No cover fixing devices	N
17.8	Fixing devices for detachable legs or stands provided	No detachable legs and stands	N
17.9	Internal pluggable connections, affecting safety, unlikely to become disconnected	Connection reliable.	P
18	MECHANICAL STRENGTH OF PICTURE TUBES AND PROTECTION AGAINST THE EFFECTS OF IMPLOSION		N
	Picture tube separately approved to IEC 61965:	No picture tube	N
	Picture tube separately approved to 18.1		N
18.1	Picture tubes > 16 cm intrinsically protected		N

IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
	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		N
18.2.2	Samples subject to implosion test: 6		N
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		P
	Mass of the equipment exceeding 7kg ..... :	<7kg	P
	Apparatus intended to be fastened in place – suitable instructions	Not intended to be fastened in place	N
19.1	Test on a plane, inclined at 10° to the horizontal		N
19.2	100 N force applied vertically downwards		N
19.3	Apparatus mass > 25 kg or height > 1 M or supplied with cart or stand	Not such apparatus	N
19.4	Edges or corners not hazardous	Edges and corners of enclosure are rounded	P
19.5	Glass surfaces with an area exceeding 0,1 m² or maximum dimension > 450 mm, pass the test of 19.5.1	None	N
19.6	Wall or ceiling mountings adequate	None	N
20	RESISTANCE TO FIRE		P
20.1	Electrical components and mechanical parts		P
	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	considered	P
20.1.1	Electrical components meet the requirements of Clause 14 or 20.1.4	See sub-clause 14 and appended table	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	<4kV	N

IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict
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	See appended component list	P
	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	<400V	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		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	No barrier used	N
20.2	Fire enclosure		N
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	<4kV	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		N
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		N
	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 cause 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

7.1	TABLE: temperature rise measurements		P
	Power consumption in the OFF/Stand-by		P
	Position of the functional switch (W) .....:	0	—

Operating conditions

-100Hz sine-wave to the audio-input terminal, 1/8 of the non-clipped output power to the impedance

Un (V)	In (A)		Pn (W)		Pout (W)
	50Hz	60Hz	50Hz	60Hz	
264	0.13	0.14	16	18	--
240	0.09	0.09	13	14	--
220	0.07	0.08	10	10	--
198	0.06	0.06	9	9	--

	Loudspeaker impedance (Ω)	4Ω+4Ω	—
	Several loudspeaker systems	--	
	Marking of loudspeaker terminals	--	

Monitored point:	dT (K)				Limit dT (K)
	50Hz		60Hz		
Supply Voltage	198V	264V	198V	264V	--
T1 metal enclosure	14.6	19.8	15.0	19.3	--
T1 core	14.4	17.6	14.0	19.4	85
T1 coil	9.9	13.1	9.8	14.7	75
C24	11.8	12.7	10.7	15.9	--
Input wire in primary	3.1	3.8	3.1	3.8	60
Output wire in secondary	5.5	6.2	5.3	7.2	60
Inside of enclosure	5.3	5.3	5.2	5.6	60
Outside of enclosure	6.3	7.4	6.5	9.1	60
PCB	27.4	31.7	25.9	38.2	85
Heat sink	19.6	23.3	18.7	27.7	--

	Winding temperature rise measurements		P
	Ambient temperature t1 (^{o}C) .....:	23.0	—
	Ambient temperature t2 (^{o}C) .....:	26.2 (198V,50Hz) 25.8 (198V,60Hz) 25.7 (264V,50Hz) 25.6 (264V,60Hz)	—

IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict

7.1(con.)	TABLE: temperature rise measurements					P
Temperature rise dT of winding:		R_1 (Ω)	R_2 (Ω)	dT (K)	Limit dT (K)	Insulation class
Transformer coil (primary)	198V,50Hz	64.3	69.1	16.0	85	--
Transformer coil (primary)	264V,50Hz	64.3	70.8	23.3	85	--
Transformer coil (primary)	198V,60Hz	64.3	69.2	16.8	85	--
Transformer coil (primary)	264V,60Hz	64.3	71.2	25.0	85	--

7.2	TABLE: softening temperature of thermoplastics			N
Temperature T of part	T - normal conditions (^oC)	T - fault conditions (^oC)	T softening (^oC)	
Switch and voltage setting device are separately approved.				

10.3	TABLE: insulation resistance measurements		P
Insulation resistance R between:		R (MΩ)	Required R (MΩ)
Between L—N		>100	≥2
Between mains poles and terminal		>100	≥4
Between primary and secondary coil of transformer		>100	≥4

10.3	TABLE: electric strength measurements		P
Test voltage applied between:		Test voltage (V)	Breakdown
Between L—N		1500Vac	No
Between mains poles and terminal		3000Vac	No
Between primary and secondary coil of transformer		3000Vac	No
Between primary coil and core of transformer		3000Vac	No

IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict

11.2	TABLE: summary of fault condition tests					P
fault condition, state component short- or open circuited and components whose temperature rises are measured				supply voltage (V)	Result, state effect of fault condition and the duration of the test	
No.	component	fault	Temperature measured(℃)		Test duration	Result
1	C30	s	T1 core:26.2 T1 coil:31.2 PCB:7.2 Enclosure:2.1	264	3min	Input current: 0.09A-0.61A-0A, F1 opened,D1 damage, No excessive temperature rises. No hazard.
2	C37	s	--	264	30min	Input current:0.09A . normal operation. No excessive temperature rises.No hazard.
3	C53	s	--	264	30min	Input current:0.09A . normal operation. No excessive temperature rises.No hazard.
4	C51	s	--	264	30min	Input current:0.09A . normal operation. No excessive temperature rises.No hazard.
5	C13	s	--	264	30min	Input current:0.09A . normal operation. No excessive temperature rises.No hazard.
6	R41	s	--	264	30min	Input current:0.09A . normal operation. No excessive temperature rises.No hazard.
7	D4	s	--	264	<1s	Input current :0.09A -0A., F1 opened, No excessive temperature rises.No hazard.
8	Left output	s	T1 core:41.5 T1 coil:44.1 PCB:37.5 Enclosure:23.9	264	3h	Input current :0.09A –0.17A., output stopped, No excessive temperature rises.No hazard.
9	IC10(1-2)	s	T1 core:51.7 T1 coil:53.3 PCB:41.9 Enclosure:25.4	264	3h	Input current :0.09A –0.22A., not normal operation, No excessive temperature rises.No hazard.
10	C40	s	--	264	<1s	Input current :0.09A -0A., F1 opened, No excessive temperature rises.No hazard.
s:short circuit						

IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict

13	TABLE: clearance and creepage distance measurements					P
Clearance(cl) and creepage distance(dcr) at/of:	Up(V)	Ur.m.s.(V)	Required cl(mm)	Cl(mm)	Required dcr(mm)	Dcr(mm)
Transformer primary to secondary coil	387	264	4.0	14.2	5.1	17.8
L and N	339	240	2.0	12.7	2.5	12.7

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
Flexible Cord	Yuyao Jingyi Electronics Co., Ltd.	H03VVH2-F	2X0.75 mm^2	VDE0281-5	VDE (133957)
	Volex (Asia) Pte. Ltd.				VDE （103704）
Mains Plug	Yuyao Jingyi Electronics Co., Ltd.	JY-001	2,5A 250V~	EN 50075	VDE (40008181)
	Volex (Asia) Pte. Ltd.	M4206	2,5A 250V~		VDE （137417）
PCB	KINGBOARD LAMINATES LTD.	KB-3151	94V-0, 130◦C	UL94	UL (E123995)
Fuse (F1)	Shenzhen Lanson Electronics Co. Ltd.	3JFxxx250V	F0.5A/250V	EN 60127-1	VDE （40009301）
Switch	YUEQING GOLDEN ANCHOR ELECTRONIC ELECTRIC INDUSTRY CO.	SW-2	5A/40A 250V～	GB15092.1-2003(IEC 61058)	CQC03002005625
Transformer T1	SHENZHEN BAOAN XINXINDA ELECTRONIC FACTORY	EI57	Class B	IEC 60065:2001	Tested within appliance
Bobbin	E I DUPONT DE NEMOURS & CO INC	/	130◦C, 94V-2	--	UL(E41938)
	NAN YA PLASTICS CORP	/	130◦C, 94V-2		UL(E130155)
	GUANGZHOU KINGFA SCIENCE & TECHNOLOGY CO LTD	/	130◦C, 94V-2		UL(E171666)
Tape	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD	PZ-28	130◦C	--	UL(E165111)
	FOSHAN INDER ADHESIVE PRODUCTS CO LTD	24D			UL(E212612)

IEC 60065			
Clause	Requirement – Test	Result - Remark	Verdict

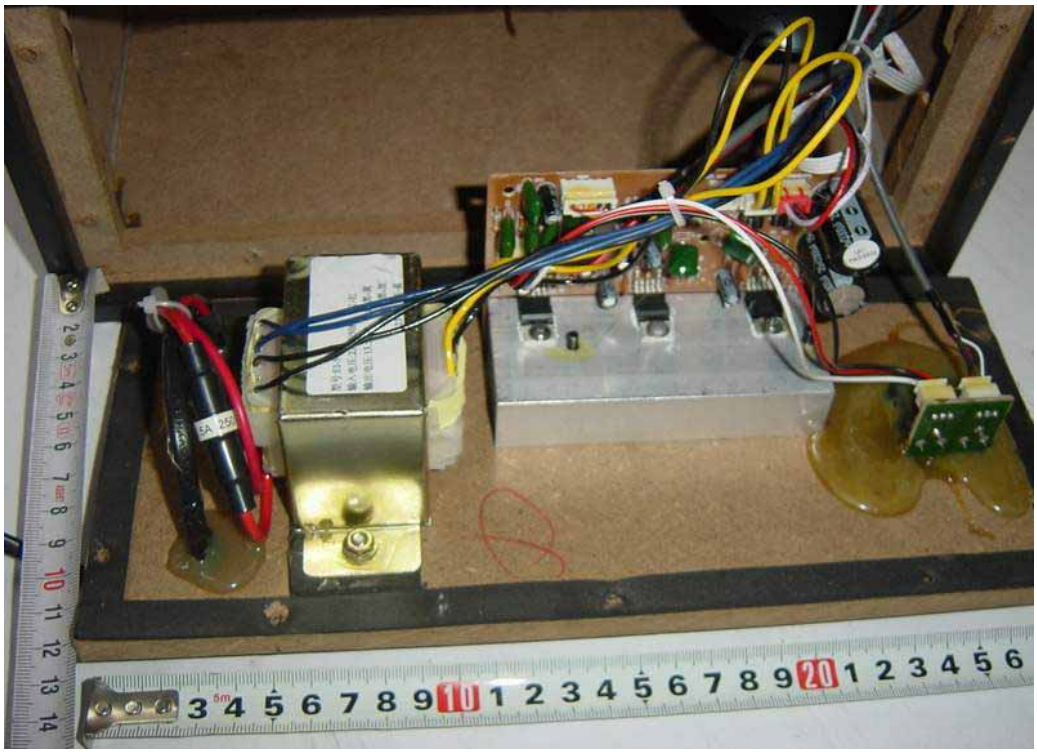
Component	Manufacturer/ trademark	Type/model	Value / rating	Standard	Approval/ Reference
Primary winding / Secondary winding	HUIYANG GOLDEN OCEAN MAGNET WIRE FACTORY	2UEW	130◦C		UL (E225143)
	SHENZHEN DAYANG INDUSTRY CO LTD	2UEW	130◦C		UL (E176101)
	GUANGDONG RONSEN SUPER MICRO-WIRE CO LTD	2UEW	130◦C		UL (E164502)
Secondary leadout /Primary leadout	DONGGUAN SHIPAI LICHENG ELECTRONICS CO	UL1015	AWG22,105◦C	--	UL (E205058)
	LEE YUEN ELECTRICAL MFY	UL1015	AWG22,105◦C		UL (E137515)
Thermal link used in transformer	Xiamen Set Electronics Co.,Ltd	RH	115◦C, 2A, 250V	IEC 60691	200201020500 9194
	Aupo Electronics Ltd.	A2	115◦C, 2A, 250V	IEC 60691	UL (E140847) VDE (40008720)

Sample photo:

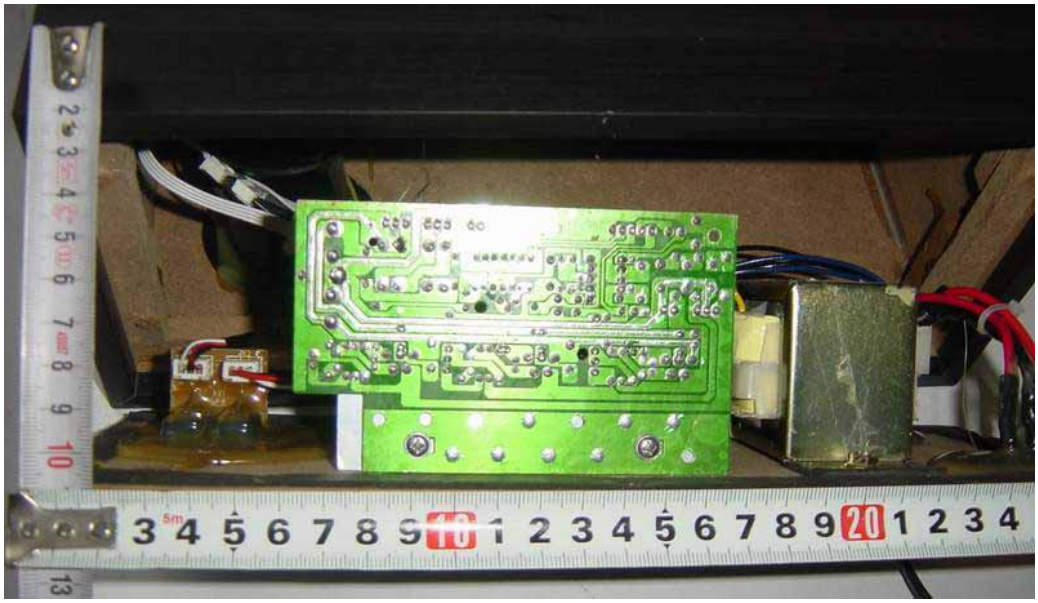
Front of REVO-3

side of REVO-3

back of REVO-3



Inside of REVO-3



Inside of REVO-3

circuit scheme