APPLICATION FOR R&TTE DIRECTIVE

On Behalf of

TBS Avionics Co. Limited

Video Transmitter

Model: TBS GREENHORN

Prepared For : **TBS Avionics Co. Limited**

Room G, 4/F, Winner Factory Building, No.55 Hung To Road, Kwun Tong, Kln, HK

Prepared By : **Shenzhen Anbotek Compliance Laboratory Limited**

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Date of Test:	**Dec. 25, 2014 to Jan. 20, 2015**
Date of Report:	**Jan. 20, 2015**
Report Number:	**R011412646S**

TEST REPORT
EN 60950-1
Information technology equipment
– Safety –Part 1: General requirements

Reference No.	:	R011412646S
Compiled by (+ signature)	:	Jamin Ou / Project Engineer
Approved by (+ signature)	:	Terry Tian / Project Manager
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Testing laboratory

Name	:	Shenzhen Anbotek Compliance Laboratory Limited
Address	:	1/F., Building 1, SEC Industrial Park, No.0409 Qianhai Road, Nanshan District, Shenzhen, Guangdong, China
Testing location	:	Same as above

Client

Name	:	TBS Avionics Co. Limited
Address	:	Room G, 4/F, Winner Factory Building, No.55 Hung To Road, Kwun Tong, Kln, HK

Test specification

Standard	:	EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013
Test procedure	:	Compliance with EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013
Procedure deviation	:	N.A.
Non-standard test method	:	N.A.

Test item

Description	:	Video Transmitter
Trademark	:	N.A.
Model and/or type reference	:	TBS GREENHORN
Manufacturer	:	TBS Avionics Co. Limited
Address	:	Room G, 4/F, Winner Factory Building, No.55 Hung To Road, Kwun Tong, Kln, HK
Factory	:	TBS Avionics Co. Limited
Address	:	Room G, 4/F, Winner Factory Building, No.55 Hung To Road, Kwun Tong, Kln, HK
Rating(s)	:	DC 5V

Test item particulars :	Video Transmitter
Equipment mobility :	☒ Movable ☐ Hand-held ☐ Transportable ☐ Stationary ☐ For building-in ☐ Direct plug-in
Connection to the mains :	☐ Pluggable equipment ☐ Type A ☐ Type B ☐ Permanent connection ☐ Detachable power supply cord ☐ Non-detachable power supply cord ☒ Not directly connected to the mains ☐ built-in component, consider in end system
Operating condition :	☒ Continuous ☐ Rated operating / resting time:
Over voltage category (OVC) :	☐ OVC I ☒ OVC II ☐ OVC III ☐ OVC IV ☐ Other:
Tested for IT power systems :	☐ Yes ☒ No
IT testing, phase-phase voltage (V) :	N.A.
Class of equipment :	☐ Class I ☐ Class II ☒ Class III ☐ Not classified
Considered current rating (A) :	
Pollution degree (PD) :	☐ PD 1 ☒ PD 2 ☐ PD 3
IP protection class :	IPX0
Altitude during operation (m) :	2000
Altitude of test laboratory (m) :	<500
Mass of equipment (kg) :	1.12
Possible test case verdicts:	
- test case does not apply to the test object :	N（.A.）
- test object does meet the requirement :	P (Pass)
- test object does not meet the requirement :	F (Fail)
Testing :	
Date of receipt of test item :	Dec. 25, 2014
Date(s) of performance of tests :	Dec. 25, 2014 to Jan. 20, 2015

General remarks

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

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

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

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

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

Remark:

1. The EUT for supplying information technology equipment.
2. Clearance was evaluated for altitude up to 2000m above sea level.
3. The maximum ambient temperature is 40℃.

Copy of marking plate (s):

Video Transmitter
Model: TBS GREENHORN
Rating: DC 5V

CE2280

TBS Avionics Co. Limited

Summary of testing

Rubbing for 15 s with a piece of cloth soaked with water. And a further 15 s with a piece of cloth soaked with petroleum.

EN 60950-1/Am1			
Clause	Requirement – Test	Result - Remark	Verdict
1	**GENERAL**		P
1.5	**Components**		P
1.5.1	General		P
	Comply with IEC 60950 or relevant component standard	Components, which were found to affect safety aspects comply with the requirements of this aspects of the relevant IEC component standards. (See appended table 1.5.1)	P
1.5.2	Evaluation and testing of components		P
1.5.3	Thermal controls	No thermal controls provided	N
1.5.4	Transformers		N
1.5.5	Interconnecting cables	No interconnecting cable provided.	N
1.5.6	Capacitors bridging insulation	No such capacitors used.	N
1.5.7	Resistors bridging insulation		N
1.5.7.1	Resistors bridging functional insulation, basic insulation or supplementary insulation		N
1.5.7.2	Resistors bridging double insulation or reinforced insulation between the a.c. mains supply and other circuits		N
1.5.7.3	Resistors bridging double insulation or reinforced insulation between the a.c. mains supply and circuits connected to an antenna or coaxial cable	No bridging resistors.	N
1.5.8	Components in equipment for IT power systems	TN power system.	N
1.5.9	Surge suppressor		N
1.5.9.1	General		N
1.5.9.2	Protection of VDRs		N
1.5.9.3	Bridging of functional insulation by a VDR		N
1.5.9.4	Bridging of basic insulation by a VDR		N
1.5.9.5	Bridging of supplementary, double or reinforced by a VDR		N
1.6	**Power interface**		P
1.6.1	AC power distribution systems		N
1.6.2	Input current	(see appended table 1.6.2)	P
1.6.3	Voltage limit of hand-held equipment		P
1.6.4	Neutral conductor	Class III equipment	N

EN 60950-1/Am1			
Clause	Requirement – Test	Result - Remark	Verdict
1.7	**Marking and instructions**		P
1.7.1	Power rating	See below	P
	Rated voltage(s) or voltage range(s) (V) .....:	DC 5V	P
	Symbol for nature of supply, for d.c. only .....:	⎓	P
	Rated frequency or frequency range (Hz) :		N
	Rated current (mA or A) .....:		P
	Manufacturer's name or trademark or identification marks .....:	TBS Avionics Co. Limited	P
	Type/model .....:	TBS GREENHORN	P
	Symbol of Class II equipment only .....:	Class III equipment	N
	Other symbols .....:		N
	Certification marks .....:		P
1.7.2	Safety instructions	See user manual	P
1.7.3	Short duty cycles	Equipment is designed for continuous operation.	N
1.7.4	Supply voltage adjustment .....:	Input not adjustable.	N
	Methods and means of adjustment; reference to installation instructions .....:		--
1.7.5	Power outlets on the equipment .....:	No power outlets on the equipment.	N
1.7.6	Fuse identification (marking, special fusing characteristics, cross-reference) .....:	No such device within the EUT	N
1.7.7	Wiring terminals	Class III equipment	N
1.7.7.1	Protective earthing and bonding terminals		N
1.7.7.2	Terminal for a.c. mains supply conductors	No such terminal used except separately approved switch power supply.	N
1.7.7.3	Terminal for d.c. mains supply conductors		N
1.7.8	Controls and indicators		P
1.7.8.1	Identification, location and marking	No controls and identification.	N
1.7.8.2	Colours		P
1.7.8.3	Symbols according to IEC 60417		N
1.7.8.4	Markings using figures		N
1.7.9	Isolation of multiple power sources	Only one supply voltage provided.	N
1.7.10	Thermostats and other regulating devices	No such components.	N

EN 60950-1/Am1			
Clause	Requirement – Test	Result - Remark	Verdict
1.7.11	Durability	The marking was rubbed with cloth soaked with water for 15 sec. and then again for 15 sec. with the cloth soaked with petroleum spirit. After this test, the marking still legible and durable.(see appended tables 1.7.11)	P
1.7.12	Removable parts	No removable parts	N
1.7.13	Replaceable batteries		P
	Language.....:	English	--
1.7.14	Equipment for restricted access locations.....:	Unit is not limited to be used in restricted access locations.	N
2	**PROTECTION FROM HAZARDS**		--
2.1	Protection from electric shock and energy hazards		P
2.1.1	Protection in operator access areas	The EUT is Class III equipment, no hazardous live parts within the EUT	P
2.1.1.1	Access to energized parts		N
	Test by inspection .....:		N
	Test with test finger .....:		N
	Test with test pin .....:		N
	Test with test probe .....:	No TNV present.	N
2.1.1.2	Battery compartments .....:		N
2.1.1.3	Access to ELV wiring	No ELV wiring in operator accessible area.	N
	Working voltage (Vpeak or Vrms); minimum distance (mm) through insulation		--
2.1.1.4	Access to hazardous voltage circuit wiring	No hazardous voltage wiring in operator accessible area.	N
2.1.1.5	Energy hazards .....:	No energy hazard in operator access area	P
2.1.1.6	Manual controls		N
2.1.1.7	Discharge of capacitors in equipment	Class III equipment	N
	Time-constant (s); measured voltage (V).....:		--
2.1.1.8	Energy hazards d.c. mains supplies		N

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Clause	Requirement – Test	Result - Remark	Verdict
2.1.1.9	Audio amplifiers in information technology equipment		N
2.1.2	Protection in service access areas	No service access area.	N
2.1.3	Protection in restricted access locations	No restricted access location.	N
2.2	**SELV circuits**		--
2.2.1	General requirements		P
2.2.2	Voltages under normal conditions (V) ……..:	Not exceed 60V dc in SELV circuit	P
2.2.3	Voltages under fault conditions (V) .....:	Not exceed 60V dc in SELV circuit	P
2.2.3.1	Separation by double insulation or reinforced insulation (method 1)	Method 1 used. SELV separate from primary by reinforced or double insulation.	N
2.2.3.2	Separation by earthed screen (method 2)		N
2.2.3.3	Protection by earthing of the SELV circuit (method 3)		N
2.2.4	Connection of SELV circuits to other circuits ... :	SELV circuit only for connection to other SELV circuits.	P
2.3	**TNV circuits**		N
2.3.1	Limits		N
	Type of TNV circuits .....:		N
2.3.2	Separation from other circuits and from accessible parts		N
	Insulation employed .....:		N
2.3.3	Separation from hazardous voltages		N
	Insulation employed .....:		N
2.3.4	Connection of TNV circuits to other circuits		N
	Insulation employed .....:		N
2.3.5	Test for operating voltages generated externally		N
2.4	**Limited current circuits**		N
2.4.1	General requirements		N
2.4.2	Limit values		N
	Frequency (Hz).....:		--
	Measured current (mA) .....:		--

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Clause	Requirement – Test	Result - Remark	Verdict
	Measured voltage (V) .....:		--
	Measured capacitance (μF) .....:		--
2.4.3	Connection of limited current circuits to other circuits	Only intended to be connected with SELV circuits	N
2.5	**Limited power sources**		---
	Inherently limited output		N
	Impedance limited output		N
	Overcurrent protective device limited output		N
	Regulating network limited output under normal operating and single fault condition		N
	Regulating network limited output under normal operating conditions and overcurrent protective device limited output under single fault condition		N
	Output voltage (V), output current (A), apparent power (VA)..... :		N
	Current rating of overcurrent protective device (A)		N
2.6	**Provisions for earthing and bonding**		--
2.6.1	Protective earthing	Class III equipment	N
2.6.2	Functional earthing		N
2.6.3	Protective earthing and protective bonding conductors		N
2.6.3.1	General		N
2.6.3.2	Size of protective earthing conductors		N
	Rated current (A), cross-sectional area (mm^2), AWG .....:		--
2.6.3.3	Size of protective bonding conductors	See below	N
	Rated current (A), cross-sectional area (mm^2), AWG .....:		--
2.6.3.4	Resistance (Ω) of earthing conductors and their terminations, test current(A)	See appended table 2.6.3.3	N
2.6.3.5	Colour of insulation.....:		N
2.6.4	Terminals		N
2.6.4.1	General		N
2.6.4.2	Protective earthing and bonding terminals		N
	Rated current (A), type and nominal thread diameter (mm) .....:		--

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Clause	Requirement – Test	Result - Remark	Verdict
2.6.4.3	Separation of the protective earthing conductor from protective bonding conductors		N
2.6.5	Integrity of protective earthing		N
2.6.5.1	Interconnection of equipment		N
2.6.5.2	Components in protective earthing conductors and protective bonding conductors		N
2.6.5.3	Disconnection of protective earth		N
2.6.5.4	Parts that can be removed by an operator		N
2.6.5.5	Parts removed during servicing		N
2.6.5.6	Corrosion resistance	All safety earthing connections in compliance with Annex J.	N
2.6.5.7	Screws for protective bonding		N
2.6.5.8	Reliance on telecommunication network or cable distribution system		N
2.7	**Overcurrent and earth fault protection in primary circuits**		--
2.7.1	Basic requirements		N
	Instructions when protection relies on building installation		N
2.7.2	Faults not covered in 5.3		N
2.7.3	Short-circuit backup protection		N
2.7.4	Number and location of protective devices .....:		N
2.7.5	Protection by several devices	One protective device provided	N
2.7.6	Warning to service personnel.....:	No service work necessary	N
2.8	**Safety interlocks**		N
2.8.1	General principles	No safety interlocks.	N
2.8.2	Protection requirements		N
2.8.3	Inadvertent reactivation		N
2.8.4	Fail-safe operation		N
2.8.5	moving parts		N
2.8.6	Overriding		N
2.8.7	Switches and relays		N
2.8.7.1	Contact gaps (mm) .....:		N
2.8.7.2	Overload test		N

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Clause	Requirement – Test	Result - Remark	Verdict
2.8.7.3	Endurance test		N
2.8.7.4	Electric strength test (V)		N
2.8.8	Mechanical actuators		N
2.9	**Electrical insulation**		P
2.9.1	Properties of insulating materials		P
2.9.2	Humidity conditioning	48h	P
	Relative humidity (%), temperature (°C) .....:	93%RH, 30°C	--
2.9.3	Grade of insulation	Reinforced, double, supplementary, basic and functional insulation	P
2.9.4	Separation from hazardous voltages		N
	Method(s) used .....:		--
2.10	**Clearances, creepage distances and distances through insulation**		P
2.10.1	General		N
2.10.2	Determination of working voltage	Considered	N
2.10.3	Clearances	Annex F and minimum clearances considered	N
2.10.3.1	General		N
2.10.3.2	Mains transient voltages		N
2.10.3.3	Clearances in primary circuit		N
2.10.3.4	Clearances in secondary circuits		N
2.10.3.9	Measurement of transient voltage	Normal transient voltage considered	N
2.10.4	Creepage distances		P
	CTI tests .....:	CTI rating for all materials of min.100.	--
2.10.5	Solid insulation		N
2.10.5.1	General		N
2.10.5.2	Distance through insulation		N
2.10.5.3	Insulating compound as solid insulation		N
2.10.5.4	Semiconductor devices		N
2.10.5.5	Cemented joints		N
2.10.5.6	Thin sheet material		N
	Number of layers (pcs).....:		N
	Electric strength test		--

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Clause	Requirement – Test	Result - Remark	Verdict
2.10.5.7	Separable thin sheet material		N
2.10.5.8	Non-separable thin sheet material		N
2.10.5.9	Thin sheet material – standard test procedure		N
2.10.5.10	Thin sheet material – alternative test procedure		N
2.10.5.11	Insulation in wound components		N
2.10.5.12	Wound components		N
	Number of layers (pcs).....:		N
	Two wires in contact inside component; angle between 45° and 90°		N
2.10.5.13	Wire with solvent –based enamel in wound component		N
2.10.5.14	Additional insulation in would components		N
2.10.6	Construction of printed boards		N
2.10.6.1	Uncoated printed boards		P
2.10.6.2	Coated printed boards		N
2.10.6.3	Insulation between conductors on the same inner surface of a printed board		N
2.10.6.4	Insulation between conductors on the different surface of a printed board		N
2.10.7	Component external terminations	No such components	N
2.10.8	Tests on coated printed boards and coated components		N
2.10.8.1	Sample preparation and preliminary inspection		N
2.10.8.2	Thermal conditioning		N
2.10.8.3	Electric strength test		N
2.10.8.4	Abrasion resistance test		N
2.10.9	Thermal cycling		N
2.10.10	Test for Pollution Degree 1 environment and for insulating compound		N
2.10.11	Tests for semiconductor devices and for cemented joints		N
2.10.12	Enclosed and sealed parts		N
3	**WIRING, CONNECTIONS AND SUPPLY**		P
3.1	General		N
3.1.1	Current rating and overcurrent protection		N
3.1.2	Protection against mechanical damage	Smooth wireways	P

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Clause	Requirement – Test	Result - Remark	Verdict
3.1.3	Securing of internal wiring	All internal wirings are suitable fixed	P
3.1.4	Insulation of conductors		N
3.1.5	Beads and ceramic insulators		N
3.1.6	Screws for electrical contact pressure		N
3.1.7	Insulating materials in electrical connections		N
3.1.8	Self-tapping and spaced thread screws		N
3.1.9	Termination of conductors		N
	10 N pull test		N
3.1.10	Sleeving on wiring		N
3.2	**Connection to an a.c. mains supplies or a d.c. mains supply**		N
3.2.1	Means of connection .....:		N
3.2.1.1	Connection to an a.c. mains supply		N
3.2.1.2	Connection to a d.c. mains supply		N
3.2.2	Multiple supply connections		N
3.2.3	Permanently connected equipment	Unit is not a permanently connected equipment.	N
	Number of conductors, diameter (mm) of cable and conduits .....:		--
3.2.4	Appliance inlets	No appliance inlets	N
3.2.5	Power supply cords		N
3.2.5.1	AC power supply cords		--
	Type.....:		--
	Rated current (A), cross-sectional area (mm^2), AWG ..... :		N
3.2.5.2	DC power supply cords		N
3.2.6	Cord anchorages and strain relief	See below	N
	Mass of equipment (kg), pull (N) ..... :		N
	Longitudinal displacement (mm) ..... :		--
3.2.7	Protection against mechanical damage		--
3.2.8	Cord guards		N
	D (mm); test mass (g) ..... :		N
	Radius of curvature of cord (mm)..... :		N
3.2.9	Supply wiring space		N

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Clause	Requirement – Test	Result - Remark	Verdict
3.3	**Wiring terminals for connection of external conductors**		N
3.3.1	Wiring terminals		N
3.3.2	Connection of non-detachable power supply cords		N
3.3.3	Screw terminals		N
3.3.4	Conductor sizes to be connected		N
	Rated current (A), cord/cable type, cross-sectional area (mm^2) .....:		--
3.3.5	Wiring terminal sizes		N
	Rated current (A), type and nominal thread diameter (mm) .....:		--
3.3.6	Wiring terminals design		N
3.3.7	Grouping of wiring terminals		N
3.3.8	Stranded wire		N
3.4	**Disconnection from the mains supply**		N
3.4.1	General requirement		N
3.4.2	Disconnect device		N
3.4.3	Permanently connected equipment		N
3.4.4	Parts which remain energized		N
3.4.5	Switches in flexible cords		N
3.4.6	Single-phase equipment and d.c. equipment		N
3.4.7	Three-phase equipment		N
3.4.8	Switches as disconnect devices		N
3.4.9	Plugs as disconnect devices		N
3.4.10	Interconnected equipment		N
3.4.11	Multiple power sources		N
3.5	**Interconnection of equipment**		P
3.5.1	General requirements	See below	P
3.5.2	Types of interconnection circuits.....:	Interconnection circuits of SELV through the output connectors. No ELV interconnection circuits.	P
3.5.3	ELV circuits as interconnection circuits	No ELV interconnection.	N
3.5.4	Data ports for additional equipement		N

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Clause	Requirement – Test	Result - Remark	Verdict
4	**PHYSICAL REQUIREMENTS**		N
4.1	Stability		--
	Angle of 10°	Consider in end system	N
	Test: force (N).....:		N
4.2	**Mechanical strength**		P
4.2.1	General	See below. After tests, equipment complied with 2.1.1, 2.6.1, 2.10 and 4.4.1.	P
4.2.2	Steady force test, 10 N		N
4.2.3	Steady force test, 30 N		N
4.2.4	Steady force test, 250 N		N
4.2.5	Impact test		P
	Fall test		P
	Swing test		N
4.2.6	Drop test	1000mm	P
4.2.7	Stress relief test	70 °C, all the enclosure materials listed in the table 1.5.1 are tested	P
4.2.8	Cathode ray tubes	No CRT in the unit.	N
	Picture tube separately certified..... :		N
4.2.9	High pressure lamps	No high pressure lamps.	N
4.2.10	Wall or ceiling mounted equipment; force (N) ... :		N
4.3	**Design and construction**		P
4.3.1	Edges and corners		P
4.3.2	Handles and manual controls; force (N)..... :	No such device within the EUT	N
4.3.3	Adjustable controls	No adjustable controls.	N
4.3.4	Securing of parts		N
4.3.5	Connection of plugs and sockets		N
4.3.6	Direct plug-in equipment	The EUT is not direct plug-in equipment	N
	Dimensions (mm) of mains plug for direct plug-in		N

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Clause	Requirement – Test	Result - Remark	Verdict
	Torque and pull test of mains plug for direct plug-in; torque (Nm); pull (N) ..... :		N
4.3.7	Heating elements in earthed equipment	No heating elements provided.	N
4.3.8	Batteries	No battery	N
	- Overcharging of a rechargeable battery		N
	- Unintentional charging of a non-rechargeable battery		N
	- Reverse charging of a rechargeable battery		N
	- Excessive discharging rate for any battery		N
4.3.9	Oil and grease	Insulation in intended use not considered to be exposed to oil or grease.	N
4.3.10	Dust, powders, liquids and gases	Equipment in intended use not considered to be exposed to these substances.	N
4.3.11	Containers for liquids or gases	No container for liquids or gases provided.	N
4.3.12	Flammable liquids..... :	No flammable liquids provided.	N
	Quantity of liquid (l)..... :		--
	Flash point (°C) ..... :		--
4.3.13	Radiation; type of radiation ..... :	LED as indicating light	P
4.3.13.1	General		N
4.3.13.2	Ionizing radiation	No ionising radiation.	N
	Measured radiation (pA/kg) ..... :		--
	Measured high-voltage (kV) ..... :		--
	Measured focus voltage (kV) ..... :		--
	CRT markings..... :		--
4.3.13.3	Effect of ultraviolet (UV) radiation on materials	No UV radiation.	N
	Part, property, retention after test, flammability classification ..... :		--
	Human exposure to ultraviolet (UV)radiation ..... :		--
4.3.13.5	Laser (including LEDs)		P
	Laser class ..... :	Class I	--
4.3.13.6	Other types ..... :		N
4.4	**Protection against hazardous moving parts**		N

EN 60950-1/Am1			
Clause	Requirement – Test	Result - Remark	Verdict
4.4.1	General	No hazardous moving parts.	N
4.4.2	Protection in operator access areas		N
4.4.3	Protection in restricted access locations		N
4.4.4	Protection in service access areas		N
4.5	**Thermal requirements**		P
4.5.1	General		P
4.5.2	Temperature tests	See appended table 4.5.1	P
4.5.3	Temerature limits for materials	The equipment and its component parts did not attain excessive temperatures during normal operation. (See appended table 4.5.1)	P
4.5.4	Touch temperature limits	See appended table 4.5.1	P
4.5.5	Resistance to abnormal heat	See appended table 4.5.2	N
4.6	**Openings in enclosures**		N
4.6.1	Top and side openings		N
	Dimensions (mm) ..... :		--
4.6.2	Bottoms of fire enclosures		N
	Construction of the bottom ..... :		N
4.6.3	Doors or covers in fire enclosures		N
4.6.4	Openings in transportable equipment		N
4.6.5	Adhesives for constructional purposes		N
	Conditioning temperature(℃)/time (weeks) .....:		--
4.7	**Resistance to fire**		P
4.7.1	Reducing the risk of ignition and spread of flame		P
	Method 1, selection and application of components wiring and materials		P
	Method 2, application of all of simulated fault condition tests		N
4.7.2	Conditions for a fire enclosure		P
4.7.2.1	Parts requiring a fire enclosure		P
4.7.2.2	Parts not requiring a fire enclosure		N
4.7.3	Materials		--
4.7.3.1	General		P

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Clause	Requirement – Test	Result - Remark	Verdict
4.7.3.2	Materials for fire enclosures		P
4.7.3.3	Materials for components and other parts outside fire enclosures		P
4.7.3.4	Materials for components and other parts inside fire enclosures		N
4.7.3.5	Materials for air filter assemblies	No air filter provided.	N
4.7.3.6	Materials used in high-voltage components	No high voltage components provided.	N
5	**ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS**		N
5.1	Touch current and protective conductor current		N
5.1.1	General	See sub-clauses 5.1.2 to 5.1.6	N
5.1.2	Equipment under test (EUT)		N
5.1.3	Test circuit		N
5.1.4	Application of measuring instrument	Equipment comply with Annex D.	N
5.1.5	Test procedure		N
5.1.6	Test measurements	See appended table 5.1.6.	P
	Test voltage (V) ..... :		--
	Measured current (mA) ..... :		--
	Max. allowed current (mA) ..... :		--
	Measured protective conductor current (mA) .... :		--
	Max. allowed protective conductor current (mA) :		--
5.1.7	Equipment with touch current exceeding 3.5 mA ..... :	No test necessary.	N
5.1.8	Touch currents to and from telecommunication networks and cable distribution systems and from telecommunication networks	No TNV circuit.	N
5.1.8.1	Limitation of the touch current to a telecommunication network and a cable distributions system		N
	Test voltage (V) ..... :		--
	Measured touch current (mA) ..... :		--
	Max. allowed touch current (mA) ..... :		--
5.1.8.2	Summation of touch currents from telecommunication networks ..... :		N
5.2	**Electric strength**		P

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Clause	Requirement – Test	Result - Remark	Verdict
5.2.1	General	(see appended table 5.2)	P
5.2.2	Test procedure	(see appended table 5.2)	P
5.3	**Abnormal operating and fault conditions**		N
5.3.1	Protection against overload and abnormal operation		N
5.3.2	Motors		N
5.3.3	Transformers	Evaluated within has been approved power supply	N
5.3.4	Functional insulation..... :		N
5.3.5	Electromechanical components	No electromechanical components.	N
5.3.6	Audio amplifiers in information technology equipment		N
5.3.7	Simulation of faults		N
5.3.8	Unattended equipment	None of the listed components was provided.	N
5.3.9	Compliance criteria for abnormal operating and fault conditions		N
6	**CONNECTION TO TELECOMMUNICATION NETWORKS**		N
6.1	Protection of telecommunication network service personnel, and users of other equipment connected to the network, from hazards in the equipment		---
6.1.1	Protection from hazardous voltages		---
6.1.2	Separation of the telecommunication network from earth		---
6.1.2.1	Requirements		N
	Test voltage (V) ..... :	1000V~	--
	Current in the test circuit (mA) ..... :		--
6.1.2.2	Exclusions ..... :		N
6.2	**Protection of equipment users from overvoltages on telecommunication networks**		N
6.2.1	Separation requirements		N
6.2.2	Electric strength test procedure		N
6.2.2.1	Impulse test		N
6.2.2.2	Steady-state test		N
6.2.2.3	Compliance criteria		N
6.3	Protection of telecommunication wiring system from overheating		N

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Clause	Requirement – Test	Result - Remark	Verdict
	Max. output current (A)..... :		N
	Current limiting method ..... :		N
7	**CONNECTION TO CABLE DISTRIBUTION SYSTEMS**		N
7.1	General		N
7.2	Protection of cable distribution system service persons, and users of other equipment connected to the system, from hazardous voltages in the equipment		N
7.3	Protection of equipment users from overvoltages on the cable distribution system		N
7.4	Insulation between primary circuits and cable distribution systems		N
7.4.1	General		N
7.4.2	Voltage surge test		N
7.4.3	Impulse test		N
A	**ANNEX A, TESTS FOR RESISTANCE TO HEAT AND FIRE**		**N**
A.1	Flammability test for fire enclosures of movable equipment having a total mass exceeding 18 kg, and of stationary equipment (see 4.7.3.2)		N
A.1.1	Samples ..... :		--
	Wall thickness (mm)..... :		--
A.1.2	Conditioning of samples; temperature (°C) ..... :		N
A.1.3	Mounting of samples ..... :		N
A.1.4	Test flame (see IEC 60695-11-3)		N
	Flame A, B, C or D ..... :		--
A.1.5	Test procedure		N
A.1.6	Compliance criteria		N
	Sample 1 burning time (s)..... :		--
	Sample 2 burning time (s)..... :		--
	Sample 3 burning time (s)..... :		--
A.2	Flammability test for fire enclosures of movable equipment having a total mass not exceeding 18 kg, and for material and components located inside fire enclosures (see 4.7.3.2 and 4.7.3.4)		N
A.2.1	Samples, material..... :		--
	Wall thickness (mm)..... :		--

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Clause	Requirement – Test	Result - Remark	Verdict
A.2.2	Conditioning of samples; temperature (°C) ..... :		N
A.2.3	Mounting of samples ..... :		N
A.2.4	Test flame (see IEC 60695-11-4)		N
	Flame A, B or C ..... :		--
A.2.5	Test procedure		N
A.2.6	Compliance criteria		N
	Sample 1 burning time (s) ..... :		--
	Sample 2 burning time (s) ..... :		--
	Sample 3 burning time (s) ..... :		--
A.2.7	Alternative test acc. To IEC 60695-11-5, cl. 5 and 9		N
	Sample 1 burning time (s) ..... :		--
	Sample 2 burning time (s) ..... :		--
	Sample 3 burning time (s) ..... :		--
A.3	Hot flaming oil test (see 4.6.2)		N
A.3.1	Mounting of samples		N
A.3.2	Test procedure		N
A.3.3	Compliance criterion		N
B	**ANNEX B, MOTOR TESTS UNDER ABNORMAL CONDITIONS (see 4.7.2.2 and 5.3.2)**		N
B.1	General requirements		N
	Position ..... :		--
	Manufacturer ..... :	(see appended table 1.5.1)	--
	Type ..... :	(see appended table 1.5.1)	--
	Rated values ..... :	(see appended table 1.5.1)	--
B.2	Test conditions		N
B.3	Maximum temperatures		N
B.4	Running overload test		N
B.5	Locked-rotor overload test		N
	Test duration (days) ..... :		--
	Electric strength test: test voltage (V) ..... :		--
B.6	Running overload test for d.c. motors in secondary circuits		N
B.6.1	General		N
B.6.2	Test procedure		N

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Clause	Requirement – Test	Result - Remark	Verdict
B.6.3	Alternative test procedure		N
B.6.4	Electric strength test; test voltage (V) ..... :		N
B.7	Locked-rotor overload test for d.c. motors in secondary circuits		N
B.7.1	General		N
B.7.2	Test procedure		N
B.7.3	Alternative test procedure		N
B.7.4	Electric strength test; test voltage (V) ..... :		N
B.8	Test for motors with capacitors	(see appended table 5.3)	N
B.9	Test for three-phase motors	(see appended table 5.3)	N
B.10	Test for series motors		N
	Operating voltage (V) ..... :		--
C	**ANNEX C, TRANSFORMERS (see 1.5.4 and 5.3.3)**		N
	Position ..... :		--
	Manufacturer ..... :	(see appended table 1.5.1)	--
	Type ..... :	(see appended table 1.5.1)	--
	Rated values ..... :	(see appended table 1.5.1)	--
	Method of protection ..... :		--
C.1	Overload test	(see appended table 5.3)	N
C.2	Insulation	(see appended table 5.2)	N
	Protection from displacement of windings ..... :		N
D	**ANNEX D, MEASURING INSTRUMENTS FOR TOUCH-CURRENT TESTS (see 5.1.4)**		N
D.1	Measuring instrument		N
D.2	Alternative measuring instrument		N
E	**ANNEX E, TEMPERATURE RISE OF A WINDING (see 1.4.13)**		N
F	**ANNEX F, MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES (see 2.10 and Annex G)**		N
G	**ANNEX G, ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES**		N
G.1	Clearances		N

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Clause	Requirement – Test	Result - Remark	Verdict
G.1.1	General		N
G.1.2	Summary of the procedure for determining minimum clearances		N
G.2	Determination of mains transient voltage (V)		N
G.2.1	AC mains supply .....:		N
G.2.2	Earthed d.c. mains supplies .....:		N
G.2.3	Unearthed d.c. mains supplies .....:		N
G.2.4	Battery operation ..... :		N
G.3	Determination of telecommunication network transient voltage (V) ..... :		N
G.4	Determination of required withstand voltage (V)		N
G.4.1	Mains transients and internal repetitive peaks .... :		N
G.4.2	Transients from telecommunication networks .... :		N
G.4.3	Combination of transients		N
G.4.4	Transients from cable distribution systems		N
G.5	Measurement of transient voltages (V)		N
	a) Transients from a mains supply		N
	For an a.c. mains supply		N
	For a d.c. mains supply		N
	b) Transients from a telecommunication network		N
G.6	Determination of minimum clearances ..... :		N

H	**ANNEX H, IONIZING RADIATION (see 4.3.13)**	N

J	**ANNEX J, TABLE OF ELECTROCHEMICAL POTENTIALS (see 2.6.5.6)**		N
	Metal(s) used ..... :		--

K	**ANNEX K, THERMAL CONTROLS (see 1.5.3 and 5.3.8)**		N
K.1	Making and breaking capacity		N
K.2	Thermostat reliability; operating voltage (V) ..... :		N
K.3	Thermostat endurance test; operating voltage (V) ..... :		N
K.4	Temperature limiter endurance; operating voltage (V) ..... :		N
K.5	Thermal cut-out reliability		N
K.6	Stability of operation		N

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Clause	Requirement – Test	Result - Remark	Verdict
L	**ANNEX L, NORMAL LOAD CONDITIONS FOR SOME TYPES OF ELECTRICAL BUSINESS EQUIPMENT (see 1.2.2.1 and 4.5.2)**		N
L.1	Typewriters		N
L.2	Adding machines and cash registers		N
L.3	Erasers		N
L.4	Pencil sharpeners		N
L.5	Duplicators and copy machines		N
L.6	Motor-operated files		N
L.7	Other business equipment		N
M	**ANNEX M, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1)**		N
M.1	Introduction		N
M.2	Method A		N
M.3	Method B		N
M.3.1	Ringing signal		N
M.3.1.1	Frequency (Hz) ..... :		--
M.3.1.2	Voltage (V) ..... :		--
M.3.1.3	Cadence; time (s), voltage (V) ..... :		--
M.3.1.4	Single fault current (mA) ..... :		--
M.3.2	Tripping device and monitoring voltage ..... :		N
M.3.2.1	Conditions for use of a tripping device or a monitoring voltage		N
M.3.2.2	Tripping device		N
M.3.2.3	Monitoring voltage (V) ..... :		N
N	**ANNEX N, IMPULSE TEST GENERATORS (see 1.5.7.2, 1.5.7.3, 2.10.3.9, 6.2.2.1, 7.3.2, 7.4.3 and Clause G.5)**		N
N.1	ITU-T impulse test generators		N
N.2	IEC 60065 impulse test generator		N
P	**ANNEX P, NORMATIVE REFERENCES**		--
Q	**ANNEX Q, Voltage dependent resistors (VDRs) (see 1.5.9.1)**		N
	a) Preferred climatic categories ..... :		N
	b) Maximum continuous voltage ..... :		N

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Clause	Requirement – Test	Result - Remark	Verdict
	c) Pulse current ..... :		N
R	**ANNEX R, EXAMPLES OF REQUIREMENTS FOR QUALITY CONTROL PROGRAMMES**		N
R.1	Minimum separation distances for unpopulated coated printed boards (see 2.10.6.2)		N
R.2	Reduced clearances (see 2.10.3)		N
S	**ANNEX S, PROCEDURE FOR IMPULSE TESTING (see 6.2.2.3)**		N
S.1	Test equipment		N
S.2	Test procedure		N
S.3	Examples of waveforms during impulse testing		N
T	**ANNEX T, GUIDANCE ON PROTECTION AGAINST INGRESS OF WATER (see 1.1.2)**		N
U	**ANNEX U, INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION (see 2.10.5.4)**		N
			--
V	**ANNEX V, AC POWER DISTRIBUTION SYSTEMS (see 1.6.1)**		N
V.1	Introduction		N
V.2	TN power distribution systems		N
W	**ANNEX W, SUMMATION OF TOUCH CURRENTS**		N
W.1	Touch current from electronic circuits		N
W.1.1	Floating circuits		N
W.1.2	Earthed circuits		N
W.2	Interconnection of several equipments		N
W.2.1	Isolation		N
W.2.2	Common return, isolated from earth		N
W.2.3	Common return, connected to protective earth		N
X	**ANNEX X, MAXIMUM HEATING EFFECT IN TRANSFORMER TESTS (see clause C.1)**		N
X.1	Determination of maximum input current		N

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Clause	Requirement – Test	Result - Remark	Verdict
X.2	Overload test procedure	Short circuit performed, see appended table.	N
Y	**ANNEX Y, ULTRAVIOLET LIGHT CONDITIONING TEST (see 4.3.13.3)**		N
Y.1	Test apparatus ..... :		N
Y.2	Mounting of test samples ..... :		N
Y.3	Carbon-arc light-exposure apparatus ..... :		N
Y.4	Xenon-arc light exposure apparatus ..... :		N
Z	**ANNEX Z, OVERVOLTAGE CATEGORIES (see 2.10.3.2 and Clause G.2)**		N
AA	**ANNEX AA, MANDREL TEST (see 2.10.5.8)**		N
BB	**ANNEX BB, CHANGES IN THE SECOND EDITION**		--
CC	**ANNEX CC, Evaluation of integrated circuit (IC) current limiters**		N
CC.1	General		N
CC.2	Test program 1 ..... :		
CC.3	Test program 2 ..... :		N
DD	**ANNEX DD, Requirements for the mounting means of rack-mounted equipment**		N
DD.1	General		N
DD.2	Mechanical strength test, variable N ..... :		N
DD.3	Mechanical strength test, 250N, including end stops ..... :		N
DD.4	Compliance ..... :		N
EE	**ANNEX EE, Household and home/office document/media shredders**		N
EE.1	General		N
EE.2	Markings and instructions		N
	Use of markings or symbols ..... :		N
	Information of user instructions, maintenance and/or servicing instructions ..... :		N
EE.3	Inadvertent reactivation test ..... :		N

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Clause	Requirement – Test	Result - Remark	Verdict
EE.4	Disconnection of power to hazardous moving parts ..... :		N
	Use of markings or symbols..... :		N
EE.5	Protection against hazardous moving parts		N
	Test with test finger (Figure 2A) ..... :		N
	Test with wedge probe (Figure EE1 and EE2) .... :		N

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Clause	Requirement – Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT IEC 60950-1
EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES
Information technology equipment – Safety –
Part 1: General requirements

Differences according to ..... : EN 60950-1:2006/A11:2009/A1:2010/A12:2011/A2:2013

Attachment Form No. ..... : EU_GD_IEC60950_1E

Master Attachment ..... : Date 2013-09

EN 60950-1:2006/A11:2009/A1:2010/A12:2011/A2:2013 – CENELEC COMMON MODIFICATIONS

IEC 60950-1, GROUP DIFFERENCES (CENELEC common modifications EN)			
Clause	Requirement – Test	Result - Remark	Verdict
Contents	Add the following annexes: **Annex ZA** (normative) Normative references to international publications with their corresponding European publications **Annex ZB** (normative) Special national conditions		P
General	Delete all the "country" notes in the reference document (IEC 60950-1:2005) according to the following list: 1.4.8 **Note** 2; 1.5.1 **Note** 2 & 3; 1.5.7.1 **Note** 1.5.8 **Note** 2; 1.5.9.4 **Note**; 1.7.2.1 **Note** 4, 5 & 6 2.2.3 **Note**; 2.2.4 **Note**; 2.3.2 **Note** 2.3.2.1 **Note** 2; 2.3.4 **Note** 2; 2.6.3.3 **Note** 2 & 3 2.7.1 **Note**; 2.10.3.2 **Note** 2; 2.10.5.13 **Note** 3 3.2.1.1 **Note**; 3.2.4 **Note** 3.; 2.5.1 **Note** 2 4.3.6 **Note** 1 & 2; 4.7 **Note** 4; 4.7.2.2 **Note** 4.7.3.1 **Note** 2; 5.1.7.1 **Note** 3 & 4; 5.3.7 **Note** 1 6 **Note** 2 & 5; 6.1.2.1 **Note** 2; 6.1.2.2 **Note** 6.2.2 **Note**; 6.2.2.1 **Note** 2; 6.2.2.2 **Note** 7.1 **Note** 3; 7.2 **Note**; 7.3 **Note** 1 & 2 G.2.1 **Note** 2; Annex H **Note** 2		P
General (A1:2010)	Delete all the "country" notes in the reference document (IEC 60950-1:2005/A1:2010) according to the following list: 1.5.7.1 **Note**; 6.1.2.1 **Note** 2 6.2.2.1 **Note** 2; EE.3 **Note**		P
1.3.Z1	**Add** the following subclause: 1.3.Z1 Exposure to excessive sound pressure The apparatus shall be so designed and constructed as to present no danger when used for its intended purpose, either in normal		N

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Clause	Requirement – Test	Result - Remark	Verdict
	operating conditions or under fault conditions, particularly providing protection against exposure to excessive sound pressures from headphones or earphones. NOTE Z1 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.		
(A12:2011)	In EN 60950-1:2006/A12:2011 Delete the addition of 1.3.Z1 / EN 60950-1:2006 Delete the definition of 1.2.3.Z1 / EN 60950-1:2006/A1:2010		N
1.5.1	**Add** the following NOTE: NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2002/95/EC		N
1.7.2.1 (A1:2010)	In addition, for a PORTABLE SOUND SYSTEM, the instructions shall include a warning that excessive sound pressure from earphones and headphones can cause hearing loss.		N
1.7.2.1 (A12:2011)	In EN 60950-1:2006/A12:2011 Delete NOTE Z1 and the addition for Portable Sound System. Add the following clause and annex to the existing standard and amendments.		N
	Zx Protection against excessive sound pressure from personal music players		N
	Zx.1 General This sub-clause specifies requirements for protection against excessive sound pressure from personal music players that are closely coupled to the ear. It also specifies requirements for earphones and headphones intended for use with personal music players. A personal music player is a portable equipment for personal use, that: is designed to allow the user to listen to recorded or broadcast sound or video; and primarily users headphones or earphones that can be worn in or on or around the ear; and allows the user to walk around while in use.		N

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Clause	Requirement – Test	Result - Remark	Verdict
	NOTE 1 Examples are hand-held or body-worn portable CD players, MP3 audio players, mobile phones with MP3 type features, PDA's or similar equipment. A personal music player and earphones or headphones intended to be used with personal music players shall comply with the requirements of this sub-clause. The requirements in this sub-clause are valid for musci or video mode only. The requirements do not apply: while the personal music player is connected to an external amplifier; or while the headphone or earphones are not used. NOTE 2 An external amplifier is an amplifier which is not part of the personal music player or the listening device, but which is intended to play the music as a standalone music player. The requirements do not apply to: hearing aid equipment and professional equipment; NOTE 3 Professional equipment is equipment sold through special sale s channels. All products sold through normal electronics stores are considered not to professional equipment. analogue personal music players (personal music players without any kind of digital processing of the sound signal) that are brought to the market before the end of 2015.		
	NOTE 4 This exemption has been allowed because this technology is falling out of use and it is expected that within a few years it will no longer exist. This exemption will not be extended to other technologies. For equipment which is clearly designed or intended for use by young children, the limits of EN 71-1 apply.		N
	Zx.2 Equipment requirements No safety provision is required for equipment that complies with the following: equipment provided as a package (personal music player with its listening device), where the acoustic output $L_{Aeq,T}$, is ≤ 85 dBA measured while playing the fixed "programme simulation noise" as described in EN 50332-1; and a personal music player provided with an analogue electrical output socket for a listening device, where the electrical output is ≤ 27 mV measured as described in EN 50332-2, while playing the		N

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Clause	Requirement – Test	Result - Remark	Verdict
	fixed “programme simulation noise” as described in EN 50332-1. NOTE 1 Wherever the term acoustic acoustic output is used in this clause, the 30 s A-weighted equipment sound pressure level $L_{Aeq,T}$, is meant. See also Zx.5 and Annex Zx. All other equipment shall: a) protect the user from unintentional acoustic outputs exceeding those mentioned above; and b) have a standard acoustic output level not exceeding those mentioned above, and automatically return to an output level not exceeding those mentioned above when the power is switched off; and c) provide a means to actively inform the user of the increased sound pressure when the equipment is operated with an acoustic output exceeding those mentioned above. Any means used shall be acknowledged by the user before activating a mode of operation which allows for an acoustic output exceeding those mentioned above. The acknowledgement does not need to be repeated more than once every 20 h of cumulative listening time; and NOTE 2 Examples of means include visual or audible signals. Action from the user is always required. NOTE 3 The 20 h listening time is the accumulative listening time, independent how often and how long the personal music player has been switched off. d) have a warning as specified in Zx.3; and e) not exceed the following: 1) equipment provided as a package (player with Its listening device), the acoustic output shall be ≤ 100 dBA measured while playing the fixed “programme simulation noise” described in EN 50332-1; and 2) a personal music player provided with an analogue electrical output socket for a listening device, the electrical output shall be ≤ 150 mV measured as described in EN 50332-2, while playing the fixed “programme simulation noise” described in EN 50332-1. For music where the average sound pressure (long term $L_{Aeq,T}$) measured over the duration of the song is lower than the average produced by the programme simulation noise, the warning does not need to be given as long as the average sound pressure of the song is below the basic limit of 85 dBA. In this case T becomes the duration of the song. NOTE 4 Classical music typically has an average sound pressure (long term $L_{Aeq,T}$) which is much lower than the average programme simulation noise.		

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Clause	Requirement – Test	Result - Remark	Verdict
	Therefore, if the player is capable to analyse the song and compare it with the programme simulation noise, the warning does not need to be given as long as the average sound pressure of the song is below the basic limit of 85 dBA. For example, if the player is set with the programme simulation noise to 85 dBA, but the average music level of the song is only 65 dBA, there is no need to give a warning or ask an acknowledgement as long as the average sound level of the song is not above the basic limit of 85 dBA.		
	Zx.3 Warning The warning shall be placed on the equipment, or on the packaging, or in the instruction manual and shall consist of the following: the symbol of Figure 1 with a minimum height of 5 mm; and the following wording, or similar: “To prevent possible hearing damage, do not listen at high volume levels for long periods.”  **Figure 1 – Warning label (IEC 60417-6044)** Alternatively, the entire warning may be given through the equipment display during use, when the user is asked to acknowledge activation of the higher level.		N
	Zx.4 Requirements for listening devices (headphones and earphones)		N
	Zx.4.1 Wired listening devices with analogue input With 94 dBA sound pressure output $L_{Aeq,T}$, the input voltage of the fixed “programme simulation noise” described in EN 50332-2 shall be ≥ 75 mV. This requirement is applicable in any mode where the headphones can operate (active or passive), including any available setting (for example built-in volume level control). NOTE The values of 94 dBA – 75 mV correspond with 85dBA – 27 mV and 100 dBA – 150 mV.		N
	Zx.4.2 Wired listening devices with digital input With any playing device playing the fixed “programme simulation noise” described in EN 50332-1 (and respecting the digital interface standards, where a digital interface standard exists that specifies the equivalent acoustic		N

EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2: 2013			
Clause	Requirement – Test	Result - Remark	Verdict
	level), the acoustic output $L_{Aeq,T}$ of the listening device shall be ≤ 100 dBA. This requirement is applicable in any mode where the headphones can operate, including any available setting (for example built-in volume level control, additional sound feature like equalization, etc.). NOTE An example of a wired listening device with digital input is a USB headphone.		
	Zx.4.3 Wireless listening devices In wireless mode: with any playing and transmitting device playing the fixed programme simulation noise described in EN 50332-1; and respecting the wireless transmission standards, where an air interface standard exists that specifies the equivalent acoustic level; and with volume and sound settings in the listening device (for example built-in volume level control, additional sound feature like equalization, etc.) set to the combination of positions that maximize the measured acoustic output for the abovementioned programme simulation noise, the acoustic output LAeq,T of the listening device shall be ≤ 100 dBA. NOTE An example of a wireless listening device is a Bluetooth headphone.		N
	Zx.5 Measurement methods Measurements shall be made in accordance with EN 50332-1 or EN 50332-2 as applicable. Unless stated otherwise, the time interval T shall be 30 s. NOTE Test method for wireless equipment provided without listening device should be defined.		N
2.7.1	**Replace** the subclause as follows: Basic requirements To protect against excessive current, short-circuits and earth faults in PRIMARY CIRCUITS, protective devices shall be included either as integral parts of the equipment or as parts of the building installation, subject to the following, a), b) and c): a) except as detailed in b) and c), protective devices necessary to comply with the requirements of 5.3 shall be included as parts of the equipment; b) for components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, short-circuit and earth fault protection may be provided by protective devices in the building installation;		P
	c) it is permitted for PLUGGABLE EQUIPMENT		P

EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2: 2013			
Clause	Requirement – Test	Result - Remark	Verdict
	TYPE B or PERMANENTLY CONNECTED EQUIPMENT, to rely on dedicated overcurrent and short-circuit protection in the building installation, provided that the means of protection, e.g. fuses or circuit breakers, is fully specified in the installation instructions. If reliance is placed on protection in the building installation, the installation instructions shall so state, except that for PLUGGABLE EQUIPMENT TYPE A the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet.		
2.7.2	This subclause has been declared 'void'.		N
3.2.3	Delete the NOTE in Table 3A, and delete also in this table the conduit sizes in parentheses.		N
3.2.5.1	Replace "60245 IEC 53" by "H05 RR-F"; "60227 IEC 52" by "H03 VV-F or H03 VVH2-F"; "60227 IEC 53" by "H05 VV-F or H05 VVH2-F2". In Table 3B, replace the first four lines by the following: Up to and including 6 | 0,75 [a] | Over 6 up to and including 10| (0,75) [b] 1,0 | Over 10 up to and including 16| (1,0) [c] 1,5 | In the conditions applicable to Table 3B delete the words "in some countries" in condition [a]. In NOTE 1, applicable to Table 3B, delete the second sentence.		N
3.3.4	In Table 3D, delete the fourth line: conductor sizes for 10 to 13 A, and replace with the following: Over 10 up to and including 16 | 1,5 to 2,5 | 1,5 to 4 | Delete the fifth line: conductor sizes for 13 to 16 A		N
4.3.13.6 (A1:2010)	**Replace** the existing NOTE by the following: NOTE Z1 Attention is drawn to: 1999/519/EC: Council Recommendation on the limitation of exposure of the general public to electromagnetic fields 0 Hz to 300 GHz, and 2006/25/EC: Directive on the minimum health and safety requirements regarding the exposure of workers to risks arising from physical agents (artifical optical radiation).		N

EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2: 2013			
Clause	Requirement – Test	Result - Remark	Verdict
	Standards taking into account mentioned Recommendation and Directive which demonstrate compliance with the applicable EU Directive are indicated in the OJEC.		N
Annex H	Replace the last paragraph of this annex by: At any point 10 cm from the surface of the OPERATOR ACCESS AREA, the dose rate shall not exceed 1 µSv/h (0,1 mR/h) (see NOTE). Account is taken of the background level. Replace the notes as follows: NOTE These values appear in Directive 96/29/Euratom. Delete NOTE 2.		N
Bibliography	Additional EN standards.		—
ZA	**NORMATIVE REFERENCES TO INTERNATIONAL PUBLICATIONS WITH THEIR CORRESPONDING EUROPEAN PUBLICATIONS**		—

ZB ANNEX (normative) **SPECIAL NATIONAL CONDITIONS (EN)**			
Clause	Requirement – Test	Result - Remark	Verdict
1.2.4.1	In **Denmark**, certain types of Class I appliances (see 3.2.1.1) may be provided with a plug not establishing earthing conditions when inserted into Danish socket-outlets.		N
1.2.13.14	In **Norway** and **Sweden**, for requirements see 1.7.2.1 and 7.3 of this annex.		N
1.5.7.1	In **Finland, Norway** and **Sweden**, resistors bridging BASIC INSULATION in CLASS I PLUGGABLE EQUIPMENT TYPE A must comply with the requirements in 1.5.7.1. In addition when a single resistor is used, the resistor must withstand the resistor test in 1.5.7.2.		N
1.5.8	In **Norway**, due to the IT power system used (see annex V, Figure V.7), capacitors are required to be rated for the applicable line-to-line voltage (230 V).		N
1.5.9.4	In **Finland**, **Norway** and **Sweden**, the third dashed sentence is applicable only to equipment as defined in 6.1.2.2 of this annex.		N
1.7.2.1	In **Finland**, **Norway** and **Sweden**, CLASS I PLUGGABLE EQUIPMENT TYPE A intended for connection to other equipment or a network shall, if safety relies on connection to protective earth or if surge suppressors are connected between the network terminals and accessible parts, have		N

EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2: 2013			
Clause	Requirement – Test	Result - Remark	Verdict
	a marking stating that the equipment must be connected to an earthed mains socket-outlet. The marking text in the applicable countries shall be as follows: In Finland: "Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan" In Norway: “Apparatet må tilkoples jordet stikkontakt” In Sweden: “Apparaten skall anslutas till jordat uttag” In **Norway** and **Sweden**, the screen of the cable distribution system is normally not earthed at the entrance of the building and there is normally no equipotential bonding system within the building. Therefore the protective earthing of the building installation need to be isolated from the screen of a cable distribution system. It is however accepted to provide the insulation external to the equipment by an adapter or an interconnection cable with galvanic isolator, which may be provided by e.g. a retailer. The user manual shall then have the following or similar information in Norwegian and Swedish language respectively, depending on in what country the equipment is intended to be used in: “Equipment connected to the protective earthing of the building installation through the mains connection or through other equipment with a connection to protective earthing – and to a cable distribution system using coaxial cable, may in some circumstances create a fire hazard. Connection to a cable distribution system has therefore to be provided through a device providing electrical isolation below a certain frequency range (galvanic isolator, see EN 60728-11).”		

EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2: 2013			
Clause	Requirement – Test	Result - Remark	Verdict
	NOTE In Norway, due to regulation for installations of cable distribution systems, and in Sweden, a galvanic isolator shall provide electrical insulation below 5 MHz. The insulation shall withstand a dielectric strength of 1,5 kV r.m.s., 50 Hz or 60 Hz, for 1 min. Translation to Norwegian (the Swedish text will also be accepted in Norway): “Utstyr som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkoplet utstyr – og er tilkoplet et kabel-TV nett, kan forårsake brannfare. For å unngå dette skal det ved tilkopling av utstyret til kabel-TV nettet installeres en galvanisk isolator mellom utstyret og kabel-TV nettet.” Translation to Swedish: ”Utrustning som är kopplad till skyddsjord via jordat vägguttag och/eller via annan utrustning och samtidigt är kopplad till kabel-TV nät kan i vissa fall medföra risk för brand. För att undvika detta skall vid anslutning av utrustningen till kabel-TV nät galvanisk isolator finnas mellan utrustningen och kabel-TV nätet.”		N
1.7.5	In **Denmark**, socket-outlets for providing power to other equipment shall be in accordance with the Heavy Current Regulations, Section 107-2-D1, Standard Sheet DK 1-3a, DK 1-5a or DK 1-7a, when used on Class I equipment. For STATIONARY EQUIPMENT the socket-outlet shall be in accordance with Standard Sheet DK 1-1b or DK 1-5a. For **CLASS II EQUIPMENT** the socket outlet shall be in accordance with Standard Sheet DKA 1-4a.		N
2.2.4	In **Norway**, for requirements see 1.7.2.1, 6.1.2.1 and 6.1.2.2 of this annex.		N
2.3.2	In **Finland**, **Norway** and **Sweden** there are additional requirements for the insulation. See 6.1.2.1 and 6.1.2.2 of this annex.		N
2.3.4	In **Norway**, for requirements see 1.7.2.1, 6.1.2.1 and 6.1.2.2 of this annex.		N
2.6.3.3	In the **United Kingdom**, the current rating of the circuit shall be taken as 13 A, not 16 A.		P
2.7.1	In the **United Kingdom**, to protect against excessive currents and short-circuits in the PRIMARY CIRCUIT of DIRECT PLUG-IN EQUIPMENT, tests according to 5.3 shall be conducted, using an external protective device rated 30 A or 32 A. If these tests fail, suitable protective devices shall be included as integral parts of the DIRECT PLUG-IN EQUIPMENT, so that the requirements of 5.3 are met.		N

EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2: 2013			
Clause	Requirement – Test	Result - Remark	Verdict
2.10.5.13	In **Finland**, **Norway** and **Sweden**, there are additional requirements for the insulation, see 6.1.2.1 and 6.1.2.2 of this annex.		N
3.2.1.1	In **Switzerland**, supply cords of equipment having a RATED CURRENT not exceeding 10 A shall be provided with a plug complying with SEV 1011 or IEC 60884-1 and one of the following dimension sheets: SEV 6532-2.1991 Plug Type 15 3P+N+PE 250/400 V, 10 A SEV 6533-2.1991 Plug Type 11 L+N 250 V, 10 A SEV 6534-2.1991 Plug Type 12 L+N+PE 250 V, 10 A In general, EN 60309 applies for plugs for currents exceeding 10 A. However, a 16 A plug and socket-outlet system is being introduced in Switzerland, the plugs of which are according to the following dimension sheets, published in February 1998: SEV 5932-2.1998: Plug Type 25 , 3L+N+PE 230/400 V, 16 A SEV 5933-2.1998:Plug Type 21, L+N, 250 V, 16A SEV 5934-2.1998: Plug Type 23, L+N+PE 250 V, 16 A		N
3.2.1.1	In **Denmark**, supply cords of single-phase equipment having a rated current not exceeding13 A shall be provided with a plug according to the Heavy Current Regulations, Section 107-2-D1. CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a. If poly-phase equipment and single-phase equipment having a RATED CURRENT exceeding 13 A is provided with a supply cord with a plug, this plug shall be in accordance with the Heavy Current Regulations, Section 107-2-D1 or EN 60309-2.		N

EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2: 2013			
Clause	Requirement – Test	Result - Remark	Verdict
3.2.1.1	In **Spain**, supply cords of single-phase equipment having a rated current not exceeding 10 A shall be provided with a plug according to UNE 20315:1994. Supply cords of single-phase equipment having a rated current not exceeding 2,5 A shall be provided with a plug according to UNE-EN 50075:1993. CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules, shall be provided with a plug in accordance with standard UNE 20315:1994. If poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance with UNE-EN 60309-2.		N
3.2.1.1	In the **United Kingdom**, 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. NOTE 'Standard plug' is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug.		N
3.2.1.1	In **Ireland**, apparatus which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to I.S. 411 by means of that flexible cable or cord and plug, shall be fitted with a 13 A plug in accordance with Statutory Instrument 525:1997 - National Standards Authority of Ireland (section 28) (13 A Plugs and Conversion Adaptors for Domestic Use) Regulations 1997.		N
3.2.4	In **Switzerland**, for requirements see 3.2.1.1 of this annex.		N
3.2.5.1	In the **United Kingdom**, a power supply cord with conductor of 1,25 mm2 is allowed for equipment with a rated current over 10 A and up to and including 13 A.		N

EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2: 2013			
Clause	Requirement – Test	Result - Remark	Verdict
3.3.4	In the **United Kingdom**, the range of conductor sizes of flexible cords to be accepted by terminals for equipment with a RATED CURRENT of over 10 A up to and including 13 A is: • 1,25 mm^2 to 1,5 mm^2 nominal cross-sectional area.		N
4.3.6	In the **United Kingdom**, the torque test is performed using a socket outlet complying with BS 1363 part 1:1995, including Amendment 1:1997 and Amendment 2:2003 and the plug part of DIRECT PLUG-IN EQUIPMENT shall be assessed to BS 1363: Part 1, 12.1, 12.2, 12.3, 12.9, 12.11, 12.12, 12.13, 12.16 and 12.17, except that the test of 12.17 is performed at not less than 125 °C. Where the metal earth pin is replaced by an Insulated Shutter Opening Device (ISOD), the requirements of clauses 22.2 and 23 also apply.		N
4.3.6	In **Ireland**, DIRECT PLUG-IN EQUIPMENT is known as plug similar devices. Such devices shall comply with Statutory Instrument 526:1997 - National Standards Authority of Ireland (Section 28) (Electrical plugs, plug similar devices and sockets for domestic use) Regulations, 1997.		N
5.1.7.1	In **Finland**, **Norway** and **Sweden** TOUCH CURRENT measurement results exceeding 3,5 mA r.m.s. are permitted only for the following equipment: • STATIONARY PLUGGABLE EQUIPMENT TYPE A that is intended to be used in a RESTRICTED ACCESS LOCATION where equipotential bonding has been applied, for example, in a telecommunication centre; and has provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR; and is provided with instructions for the installation of that conductor by a SERVICE PERSON; • STATIONARY PLUGGABLE EQUIPMENT TYPE B; • STATIONARY PERMANENTLY CONNECTED EQUIPMENT.		N

EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2: 2013			
Clause	Requirement – Test	Result - Remark	Verdict
6.1.2.1 (A1:2010)	In **Finland**, **Norway** and **Sweden**, add the following text between the first and second paragraph of the compliance clause: If this insulation is solid, including insulation forming part of a component, it shall at least consist of either - two layers of thin sheet material, each of which shall pass the electric strength test below, or - one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below. Alternatively for components, there is no distance through insulation requirements for the insulation consisting of an insulating compound completely filling the casing, so that CLEARANCES and CREEPAGE DISTANCES do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition - passes the tests and inspection criteria of 2.10.11 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 2.10.10 shall be performed using 1,5 kV), and - is subject to ROUTINE TESTING for electric strength during manufacturing, using a test voltage of 1,5 kV.		N
	It is permitted to bridge this insulation with an optocoupler complying with 2.10.5.4 b). It is permitted to bridge this insulation with a capacitor complying with EN 60384-14:2005, subclass Y2. A capacitor classified Y3 according to EN 60384-14:2005, may bridge this insulation under the following conditions: - the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 60384-14, which in addition to the Y3 testing, is tested with an impulse test of 2,5 kV defined in EN 60950-1:2006, 6.2.2.1; - the additional testing shall be performed on all the test specimens as described in EN 60384-14; - the impulse test of 2,5 kV is to be performed before the endurance test in EN 60384-14, in the sequence of tests as described in EN 60384-14.		N

EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2: 2013			
Clause	Requirement – Test	Result - Remark	Verdict
6.1.2.2	In **Finland**, **Norway** and **Sweden**, the exclusions are applicable for PERMANENTLY CONNECTED EQUIPMENT, PLUGGABLE EQUIPMENT TYPE B and equipment intended to be used in a RESTRICTED ACCESS LOCATION where equipotential bonding has been applied, e.g. in a telecommunication centre, and which has provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR and is provided with instructions for the installation of that conductor by a SERVICE PERSON.		N
7.2	In **Finland**, **Norway** and **Sweden**, for requirements see 6.1.2.1 and 6.1.2.2 of this annex. The term TELECOMMUNICATION NETWORK in 6.1.2 being replaced by the term CABLE DISTRIBUTION SYSTEM.		N
7.3	In **Norway** and **Sweden**, for requirements see 1.2.13.14 and 1.7.2.1 of this annex.		N
7.3	In **Norway**, for installation conditions see EN 60728-11:2005.		N

Tables

1.5.1	TABLE: List of critical components				P
Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity[1])
PCB	Various	FR-4 1.2mm	XH-101 94V-0 130℃	--	--
1) An asterisk indicates a mark which assures the agreed level of surveillance.					

1.6.2	TABLE: electrical data test (in normal conditions)					P
fuse #	I rated (A)	U (V)	P (W)	I (A)	Ifuse (A)	condition
--	--	5.0	--	--	--	--
Remark:						

2.1.1.5 c) 1)	TABLE: max. V, A, VA test				N
Voltage (rated) (V)	Current (rated) (A)	Voltage (max.) (V)	Current (max.) (A)	VA (max.) (VA)	
--	--	--	--	--	
Remark: Built-in equipment, consider in system					

2.1.1.5 c) 2)	TABLE: stored energy	N
Capacitance C (μF)	Voltage U (V)	Energy E (J)
--	--	--
Remark:		

2.5	TABLE: limited power source measurement				N
Condition	Output voltage (Uoc) (V)	Output current (Isc) (A)		Apparent power (S) (VA)	
Normal condition	--	--		--	
Single fault		I_{sc} (A)		VA	
		Meas.	Limit	Meas.	Limit
--		--	--	--	--
Remark: SC=Short circuit, OC=Open circuit					

Tables

2.10.2	TABLE: Working voltage measurement				N
Component	From	To	V peak	V rms	Remark
--	--	--	--	--	--
Remark:					

2.10.3 and 2.10.4	TABLE: Clearance and creepage distance measurements					N
Clearance (cl) and creepage distance (cr) at/of/between:	U peak (V)	U r.m.s. (V)	Required cl (mm)	cl (mm)	Required cr (mm)	cr (mm)
--	--	--	--	--	--	--
Supplementary information: 1) Max. operating altitude up to 2000m above sea level, and the correction factor of Cl. is 1.00 2) Thickness of the teflon tube used inside T1, is no less than 0.4mm.						

2.10.5	TABLE: Distance through insulation measurements				N
distance through insulation di at/of:	U peak (V)	U rms (V)	Test voltage (V)	Required DTI (mm)	DTI (mm)
--	--	--	--	--	--
Remark:					

4.3.8	TABLE: Batteries									N
The tests of 4.3.8 are applicable only when appropriate battery data is not available										N
Is it possible to install the battery in a reverse polarity position?										N
	Non-rechargeable batteries			Rechargeable batteries						
	Discharging		Un-intentional charging	Charging		Discharging		Reversed charging		
	Meas. current	Manuf. Specs.		Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.	
Max. current during normal condition	--	--	--	--	--	--	--	---	---	
Max. current during fault condition	--	--	---	--	--	--	--	---	---	

Tables

Test results:	See below	Verdict
- Chemical leaks	No leakaged	N
- Explosion of the battery	No explosion	N
- Emission of flame or expulsion of molten metal	No fire	N
- Electric strength tests of equipment after completion of tests	No damaged	N
Supplementary information:		

4.5	**TABLE: Thermal requirements**			**P**
	Supply voltage (V) ..... :	5VDC	--	—
	Ambient T_{min} (°C) ..... :	40.0	--	—
	Ambient T_{max} (°C) ..... :	40.0	--	—
Maximum measured temperature T of part/at:		(Normal operation)	--	Allowed T_{max} (°C)
PCB		45.5	--	130
Enclosure outside		43.3	--	95
PCB near IC		47.6	--	130

4.5.5	**TABLE: Ball pressure test of thermoplastics**		**N**
	required impression diameter (mm) ..... :	≤ 2 mm	---
part		test temperature (°C)	impression diameter (mm)
--		--	--
Remark:			

4.7	**TABLE: Resistance to fire**				**P**
Part	Manufacturer of material	Type of material	Thickness (mm)	Flammability class	Evidence
Refer to table 1.5.1 for details					
Supplementary information:					

5.1.6	**TABLE: Touch current measurement**			**N**
Condition	terminal A (mA)	terminal A (mA)	Limit (mA)	Comments
--	--	--	--	--
Input:				

Tables

5.2	TABLE: Electric strength tests, impulse tests and voltage surge tests		P
Test voltage applied between:	Voltage shape (AC, DC, impulse, surge)	Test voltage (V)	Breakdown Yes / No
Input to enclosure	DC	500V	No
Supplementary information:			

5.3.5	TABLE: Fault condition tests		P
	ambient temperature (°C).....:	25℃	--
	model/type of power supply .....:	See page 1	--
	manufacturer of power supply .....:	See page 1	--
	rated markings of power supply.....:	See rating label	--

No.	Component No.	Fault	Test voltage (V)	Test time	Fuse #.	Fuse current (A)	Result
1	--	--	--	--	---	--	--

Remark:

The Hi-pot test conducted successfully after the completion of the fault condition.

Photos

Photo 1 [√] front [ ] rear [ ] right side [ ] left side [ ] top [ ] bottom [ ] internal	

Photo 2 [√] front [ ] rear [ ] right side [ ] left side [ ] top [ ] bottom [ ] internal	

Photos

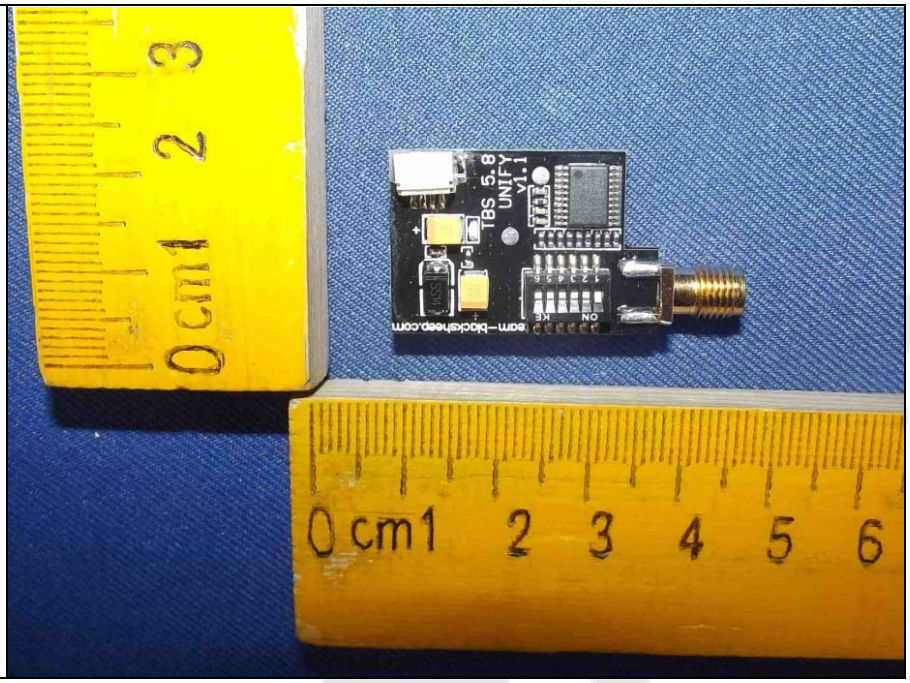
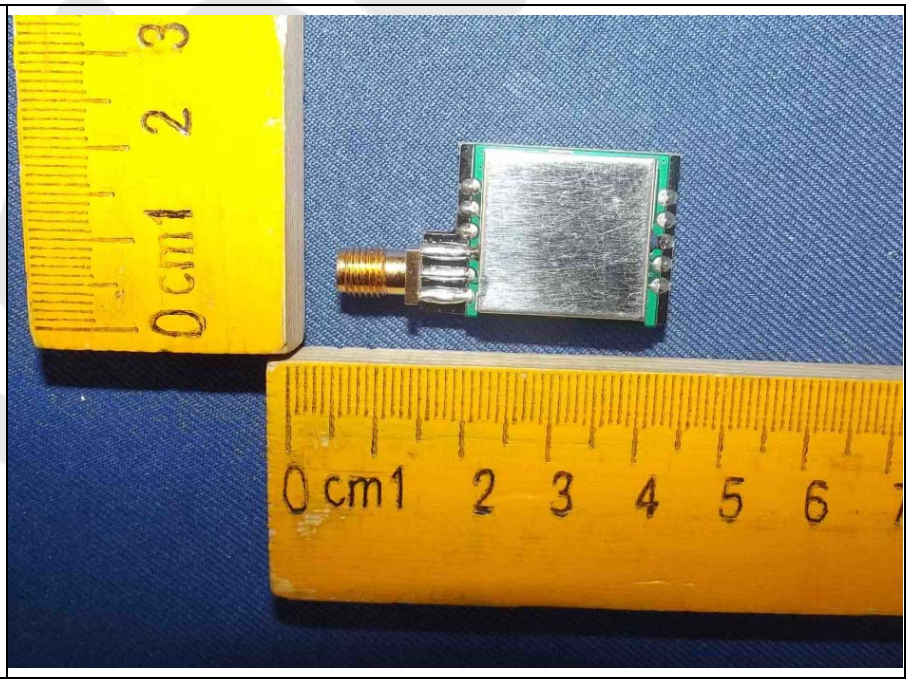
Photo 3 [ ] front [√] rear [ ] right side [ ] left side [ ] top [ ] bottom [ ] internal	

Photo 4 [ ] front [ ] rear [ ] right side [ ] left side [ ] top [√] bottom [ ] internal	

Photos

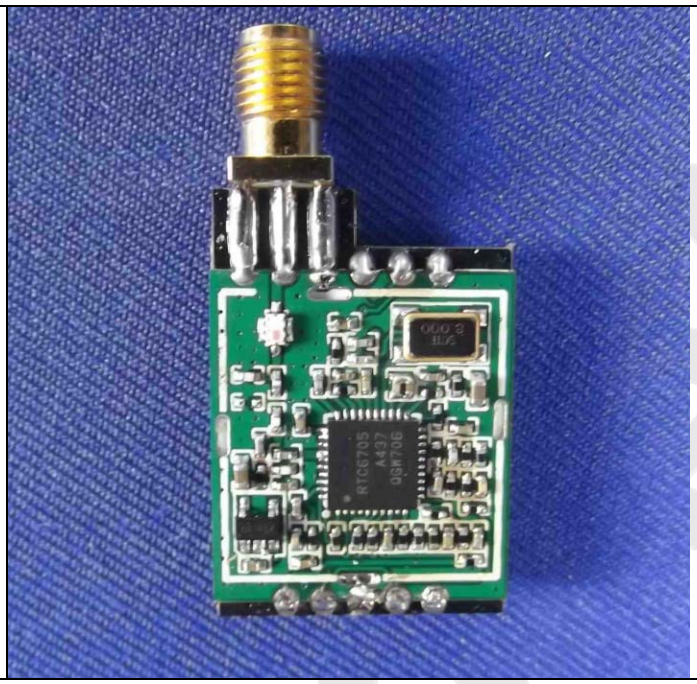
Photo 5 [√] front [ ] rear [ ] right side [ ] left side [√] top [ ] bottom [ ] internal	

Photo 6 [√] front [ ] rear [√] right side [ ] left side [ ] top [ ] bottom [ ] internal