


TEST REPORT

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011

Information technology equipment-Safety-Part 1: General requirements

EN 60825-1:2007

Safety of laser products-Part 1 : Equipment classification and requirements

Report reference No	RSC120411002-3
Compiled by (+ signature)	Andsen Ye <i>..... Anderson.ye</i>
Approved by (+ signature)	Kevin Xu <i>..... Kevin Xu</i>
Date of report issue	2012-10-11
Testing laboratory	Bay Area Compliance Laboratories Corp. (Chengdu)
Address	5040, HuiLongWan Plaza, No. 1, ShaWan Road, JinNiu District, ChengDu, China
Testing location	As above
Applicant's name	Hangzhou Huatai Optic Tech. Co., Ltd.
Address	2-2-4/F, 224 Tianmushan Road, Hangzhou 310012, P.R,China
Manufacturer's name.....	Hangzhou Huatai Optic Tech. Co., Ltd.
Address	2-2-4/F, 224 Tianmushan Road, Hangzhou 310012, P.R,China
Standard	EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 EN 60825-1:2007
Test sample(s) received	2012-03-22
Test in period.....	2012-09-27 to 2012-10-10
Procedure deviation	N.A.
Non-standard test method	N.A.
Type of test object	Optic Receiver
Trademark	
Model/type reference	HRS-26
Multi-listing	HDS-26
Model.....	
Manufacturer	Hangzhou Huatai Optic Tech. Co., Ltd.
Rating	12.0V===1000mA

Copy of marking plate:

Power In
+12VDC

Fiber Out
LC/APC

Fiber In
LC/APC

HRS-26

SAT-IF & Analog TV PIN Optical Receiver

Signal	●	<i>Optical wavelength:</i>	1260~ 1620 nm
		<i>Receiving Power:</i>	+2 ~ -8dBm
		<i>CATV Bandwidth:</i>	45~862MHz
		<i>SAT Bandwidth:</i>	950~2600MHz
		<i>RF Output level:</i>	10~30dBmV
On Line	●	<i>IF Output level:</i>	-24~-40dBm
		<i>Output Impedance:</i>	75Ω

NC **CATV-RF Output** **NC** **SAT-IF Output**

CAUTION
 RADIATION
 DO NOT STARE AT BEAM OR STRAY
 RADIATION FROM LASER INSTRUMENTS
 CLASS II LASER PRODUCT, CLASS II LASER PRODUCT
 (CLASS II LASER PRODUCT)

Test item particulars	
Equipment mobility	<input checked="" type="checkbox"/> movable <input type="checkbox"/> hand-held <input type="checkbox"/> transportable <input type="checkbox"/> stationary <input type="checkbox"/> for building-in <input type="checkbox"/> direct plug-in
Connection to the mains	<input type="checkbox"/> pluggable equipment <input type="checkbox"/> type A <input type="checkbox"/> type B <input type="checkbox"/> detachable power supply cord <input type="checkbox"/> non-detachable power supply cord <input checked="" type="checkbox"/> not directly connected to the mains(DC source)
Operating condition	<input checked="" type="checkbox"/> continuous <input type="checkbox"/> rated operating / resting time:
Access location	<input checked="" type="checkbox"/> operator accessible <input type="checkbox"/> restricted access location
Over voltage category (OVC)	<input type="checkbox"/> OVC I <input checked="" type="checkbox"/> OVC II <input type="checkbox"/> OVC III <input type="checkbox"/> OVC IV <input type="checkbox"/> other:
Mains supply tolerance (%)	N/A
Tested for IT power systems	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
IT testing, phase-phase voltage (V)	N/A
Class of equipment	<input type="checkbox"/> Class I <input type="checkbox"/> Class II <input checked="" type="checkbox"/> Class III <input type="checkbox"/> Not classified
Considered current rating of protective device as part of the building installation (A)	N/A
Pollution degree (PD)	<input type="checkbox"/> PD 1 <input checked="" type="checkbox"/> PD 2 <input type="checkbox"/> PD 3
IP protection class	IPX0
Altitude during operation (m)	< 2000
Altitude of test laboratory (m)	< 2000
Laser or LED Classification	N/A
Max. Specified ambient temperature(°C)	50°C in USER'S MANUAL
Mass of equipment (kg)	Approx. 296g (without accessories)
Possible test case verdicts	
- test case does not apply to the test object.....: N(.A.)	
- test object does meet the requirement.....: P(ass)	
- test object does not meet the requirement.....: F(ail)	
General remarks:	
"(see remark #)" refers to a remark appended to the report.	
(see appended table)" refers to a table appended to the report.	
The test results presented in this report relate only to the object tested.	
This report shall not be reproduced except in full without the written approval of the testing laboratory.	
Throughout this report a <input type="checkbox"/> comma/ <input checked="" type="checkbox"/> point is used as the decimal separator.	


General product information:

1. The EUT consists of
 - Input: DC12V $\overline{\text{---}}$ 1000mA, Optical In;
 - Output: CATV-RF OUTCertification see appended table 1.5.1

Remark: The products, model HRS-26, HDS-26, have the same diagram, layout of PCB and construction, only have different appearance, model names and Output level. So, we selected model HRS-26 as an represent model to test, please refer to the Declaration Letter provided by the manufacturer in Appendix E of this report.

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict
1	General		P
1.5	Components		P
1.5.1	General		P
	Comply with IEC60950-1 or relevant component standard	Components that were found to affect safety aspects comply with the requirements of this standard or within the safety aspects of the relevant IEC component standards. (see appended table 1.5.1)	P
1.5.2	Evaluation and testing of components	<p>Certified components are used in accordance with their ratings, certifications and they comply with applicable parts of this Standard.</p> <p>Components not certified are used in accordance with their ratings and they comply with IEC60950-1 and the relevant component Standard.</p> <p>Components, for which no relevant IEC Standard exist, have been tested under the condition occurring in the equipment, using applicable parts of IEC60950-1.</p>	P
1.5.3	Thermal controls	No thermal controls	N
1.5.4	Transformers	No transformer	N
1.5.5	Interconnecting cables	No such parts	N
1.5.6	Capacitors bridging insulation	Class III equipment	N
1.5.7	Resistors bridging insulation	Class III equipment	N
1.5.7.1	Resistors bridging functional, basic or supplementary insulation		N
1.5.7.2	Resistors bridging double or reinforced insulation between a.c. mains and other circuits	Not used.	N
1.5.7.3	Resistors bridging double or reinforced insulation between a.c. mains and antenna or coaxial cable	Not used.	N
1.5.8	Components in equipment for IT power systems	Not intend for IT power distribution systems.	N
1.5.9	Surge suppressors		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

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict
1.5.9.5	Bridging of supplementary, double or reinforced insulation 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	Not a hand-held equipment	N
1.6.4	Neutral conductor	Class III equipment.	N

1.7	Marking and instructions		P
1.7.1	Power rating and identification markings		P
1.7.1.1	Power rating marking	DC12V	P
	Multiple mains supply connections.....:		N
	Rated voltage(s) or voltage range(s) (V)		N
	Symbol for nature of supply, for d.c. only	—	P
	Rated frequency or rated frequency range (Hz) ...:		N
	Rated current (mA or A)	1000mA	P
1.7.1.2	Identification markings		P
	Manufacturer's name or trade-mark or identification mark	Trade-mark: 	P
	Model identification or type reference	HRS-26	P
	Symbol for Class II equipment only	Class III equipment	N
	Other markings and symbols		N
1.7.2	Safety instructions and marking	Operating/safety instructions made available to the user.	P
1.7.2.1	General		N
1.7.2.2	Disconnect devices		N
	-for permanently connected equipment, a readily accessible disconnect device shall be incorporated in the building installation wiring		N
	-for pluggable equipment, the socket-outlet shall be installed near the equipment and shall be easily accessible		N
1.7.2.3	Overcurrent protective device		N
1.7.2.4	IT power distribution systems		N
1.7.2.5	Operator access with a tool		N
1.7.2.6	Ozone	The equipment does not produce ozone.	N
1.7.3	Short duty cycles	Continuous operation.	N
1.7.4	Supply voltage adjustment	No voltage selector	N

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict
	Methods and means of adjustment; reference to installation instructions		N
1.7.5	Power outlets on the equipment	No standard power outlet.	N
1.7.6	Fuse identification (marking, special fusing characteristics, cross-reference)		N
1.7.7	Wiring terminals		N
1.7.7.1	Protective earthing and bonding terminals	No protective earthing and bonding terminals	N
1.7.7.2	Terminals for a.c. mains supply conductors	Power supply of the equipment is DC source	N
1.7.7.3	Terminals for d.c. mains supply conductors		N
1.7.8	Controls and indicators		N
1.7.8.1	Identification, location and marking	Such marking do not affect safety.	N
1.7.8.2	Colours	Safety is not involved	N
1.7.8.3	Symbols according to IEC 60417		N
1.7.8.4	Markings using figures	No such markings	N
1.7.9	Isolation of multiple power sources	Single DC source input.	N
1.7.10	Thermostats and other regulating devices	No thermostats or other regulating devices	N
1.7.11	Durability	Rubbed with a cloth soaked with water for 15s then again for 15s with cloth soaked with petroleum spirit, after this test, the marking on the label did not fade. there are no curling nor lifting of the label edge.	P
1.7.12	Removable parts	No marking located on a removable part.	N
1.7.13	Replaceable batteries	No battery is used	N
	Language(s)	English	—
1.7.14	Equipment for restricted access locations		N

2	Protection from hazards		P
2.1	Protection from electric shock and energy hazards		P
2.1.1	Protection in operator access areas		P
2.1.1.1	Access to energized parts		P
	Test by inspection		P
	Test with test finger (Figure 2A)		N
	Test with test pin (Figure 2B)		N
	Test with test probe (Figure 2C)		N

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict
2.1.1.2	Battery compartments	No such part	N
2.1.1.3	Access to ELV wiring	No ELV wiring in operator accessible area	N
	Working voltage (V_{peak} or V_{rms}); minimum distance through insulation (mm)		—
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 hazards present	N
2.1.1.6	Manual controls		N
2.1.1.7	Discharge of capacitors in equipment	Class III equipment	N
	Measured voltage (V); time-constant (s)		—
2.1.1.8	Energy hazards – d.c. mains supply	Not supplied by DC mains supply	N
	a) Capacitor connected to the d.c. mains supply ...:		N
	b) Internal battery connected to the d.c. mains supply		N
2.1.1.9	Audio amplifiers	No audio amplifiers	N
2.1.2	Protection in service access areas	No bare parts operating at HAZARDOUS VOLTAGES in a service access area.	P
2.1.3	Protection in restricted access locations	Equipment not intended for installation in restricted access locations	N

2.2	SELV circuits		P
2.2.1	General requirements	Equipment supplied by SELV source.	P
2.2.2	Voltages under normal conditions (V)	Not exceed SELV limit	P
2.2.3	Voltages under fault conditions (V)	Not exceed SELV limit	P
2.2.4	Connection of SELV circuits to other circuits	SELV is connected to SELV	P

2.3	TNV circuits	<i>No TNV circuits</i>	N
2.3.1	Limits		N
	Type of TNV circuits		—
2.3.2	Separation from other circuits and from accessible parts		N
2.3.2.1	General requirements		N
2.3.2.2	Protection by basic insulation		N
2.3.2.3	Protection by earthing		N
2.3.2.4	Protection by other constructions		N
2.3.3	Separation from hazardous voltages		N

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict
	Insulation employed		—
2.3.4	Connection of TNV circuits to other circuits		N
	Insulation employed		—
2.3.5	Test for operating voltages generated externally		N

2.4	Limited current circuits	<i>No limited current circuits</i>	N
2.4.1	General requirements		N
2.4.2	Limit values		N
	Frequency (Hz).....		—
	Measured current (mA)		—
	Measured voltage (V)		—
	Measured circuit capacitance (nF or μ F)		—
2.4.3	Connection of limited current circuits to other circuits		N

2.5	Limited power sources		N
	a) Inherently limited output		N
	b) Impedance limited output		N
	c) Regulating network limited output under normal operating and single fault condition		N
	d) Overcurrent protective device limited output		N
	Max. output voltage (V), max. output current (A), max. apparent power (VA)	See appendix table 2.5	—
	Current rating of overcurrent protective device (A)	No protective device	—
	Use of integrated circuit (IC) current limiters		N

2.6	Provisions for earthing and bonding	<i>No protective earthing and bonding</i>	N
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		N
	Rated current (A), cross-sectional area (mm^2), AWG		—

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict
2.6.3.4	Resistance of earthing conductors and their terminations; resistance (Ω), voltage drop (V), test current (A), duration (min)		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, nominal thread diameter (mm)		—
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		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		N
2.7.1	Basic requirements	Class III equipment	N
	Instructions when protection relies on building installation		N
2.7.2	Faults not simulated in 5.3.7		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		N
2.7.6	Warning to service personnel.....		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
	Protection against extreme hazard		N
2.8.5	Moving parts		N

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict
2.8.6	Overriding		N
2.8.7	Switches, relays and their related circuits		N
2.8.7.1	Separation distances for contact gaps and their related circuits (mm)		N
2.8.7.2	Overload test		N
2.8.7.3	Endurance test		N
2.8.7.4	Electric strength test		N
2.8.8	Mechanical actuators		N

2.9	Electrical insulation		P
2.9.1	Properties of insulating materials	Natural rubber, asbestos or hygroscopic material not used	P
2.9.2	Humidity conditioning		N
	Relative humidity (%), temperature (°C)	92%, 22°C	—
2.9.3	Grade of insulation	Function insulation only	P
2.9.4	Separation from hazardous voltages		N
	Method(s) used		—

2.10	Clearances, creepage distances and distances through insulation		N
2.10.1	General	Class III equipment, functional insulation verified according to 5.3.4 c)	N
2.10.1.1	Frequency		N
2.10.1.2	Pollution degrees		N
2.10.1.3	Reduced values for functional insulation		N
2.10.1.4	Intervening unconnected conductive parts		N
2.10.1.5	Insulation with varying dimensions	No such transformer used.	N
2.10.1.6	Special separation requirements	Special separation is not used.	N
2.10.1.7	Insulation in circuits generating starting pulses	The circuit will not generate starting pulse.	N
2.10.2	Determination of working voltage		N
2.10.2.1	General		N
2.10.2.2	RMS working voltage		N
2.10.2.3	Peak working voltage		N
2.10.3	Clearances		N
2.10.3.1	General		N
2.10.3.2	Mains transient voltages		N
	a) AC mains supply		N
	b) Earthed d.c. mains supplies		N

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict
	c) Unearthed d.c. mains supplies		N
	d) Battery operation		N
2.10.3.3	Clearances in primary circuits		N
2.10.3.4	Clearances in secondary circuits		N
2.10.3.5	Clearances in circuits having starting pulses	The circuit will not generate starting pulse.	N
2.10.3.6	Transients from a.c. mains supply		N
2.10.3.7	Transients from d.c. mains supply		N
2.10.3.8	Transients from telecommunication networks and cable distribution systems	Not connected to telecommunication networks and cable distribution systems.	N
2.10.3.9	Measurement of transient voltage levels	See below.	—
	a) Transients from a mains supply	Measurement not relevant.	N
	For an a.c. mains supply		N
	For a d.c. mains supply		N
	b) Transients from a telecommunication network :	Not connected to telecommunication networks.	N
2.10.4	Creepage distances	See below.	—
2.10.4.1	General	Considered.	N
2.10.4.2	Material group and comparative tracking index		N
	CTI tests		—
2.10.4.3	Minimum creepage distances		N
2.10.5	Solid insulation		N
2.10.5.1	General	Considered.	N
2.10.5.2	Distances 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	Not used cemented joints.	N
2.10.5.6	Thin sheet material – General		N
2.10.5.7	Separable thin sheet material		N
	Number of layers (pcs)		—
2.10.5.8	Non-separable thin sheet material	Not used.	N
2.10.5.9	Thin sheet material – standard test procedure		N
	Electric strength test		—
2.10.5.10	Thin sheet material – alternative test procedure		N
	Electric strength test		—
2.10.5.11	Insulation in wound components		N
2.10.5.12	Wire in wound components		N

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict
	Working voltage		N
	a) Basic insulation not under stress		N
	b) Basic, supplementary, reinforced insulation		N
	c) Compliance with Annex U		N
	Two wires in contact inside wound component; angle between 45° and 90°		N
2.10.5.13	Wire with solvent-based enamel in wound components	No wire with solvent-based enamel in wound components.	N
	Electric strength test		N
	Routine test		N
2.10.5.14	Additional insulation in wound components	No additional insulation used	N
	Working voltage		N
	- Basic insulation not under stress		N
	- Supplementary, reinforced insulation		N
2.10.6	Construction of printed boards	See below.	—
2.10.6.1	Uncoated printed boards	(See appended table 2.10.3 and 2.10.4)	P
2.10.6.2	Coated printed boards	No special coating in order to reduce distances.	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 different layers of a printed board		N
	Distance through insulation		N
	Number of insulation layers (pcs).....		N
2.10.7	Component external terminations	Coatings not used over terminations to increase effective creepage and clearance distances.	N
2.10.8	Tests on coated printed boards and coated components	No special coating in order to reduce distance.	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 insulating compound		N
2.10.11	Tests for semiconductor devices and cemented joints		N
2.10.12	Enclosed and sealed parts		N

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict

3	Wiring, connections and supply		N
3.1	General		N
3.1.1	Current rating and overcurrent protection		N
3.1.2	Protection against mechanical damage		N
3.1.3	Securing of internal wiring		N
3.1.4	Insulation of conductors		N
3.1.5	Beads and ceramic insulators	No beads or similar ceramic insulators on conductors.	N
3.1.6	Screws for electrical contact pressure	No screws for electrical contact pressure	N
3.1.7	Insulating materials in electrical connections	No insulating materials in electrical connections	N
3.1.8	Self-tapping and spaced thread screws	No self-tapping and spaced thread screws for the connection of current-carrying	N
3.1.9	Termination of conductors		N
	10 N pull test		N
3.1.10	Sleeving on wiring	No sleeving	N

3.2	Connection to a mains supply		N
3.2.1	Means of connection	Class III equipment	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	Only one supply connection.	N
3.2.3	Permanently connected equipment	The equipment is not intended for permanent connection to the mains.	N
	Number of conductors, diameter of cable and conduits (mm)		—
3.2.4	Appliance inlets		N
3.2.5	Power supply cords		N
3.2.5.1	AC power supply cords		N
	Type		—
	Rated current (A), cross-sectional area (mm ²), AWG		—
3.2.5.2	DC power supply cords		N
3.2.6	Cord anchorages and strain relief		N
	Mass of equipment (kg), pull (N)		—
	Longitudinal displacement (mm)		—
3.2.7	Protection against mechanical damage		N

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict
3.2.8	Cord guards		N
	Diameter or minor dimension D (mm); test mass (g):		—
	Radius of curvature of cord (mm).....:		—
3.2.9	Supply wiring space		N

3.3	Wiring terminals for connection of external conductors		N
3.3.1	Wiring terminals	Class III equipment	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, nominal thread diameter (mm)		—
3.3.6	Wiring terminal 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	Class III equipment	N
3.4.2	Disconnect devices		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	Number of poles - single-phase and d.c. equipment		N
3.4.7	Number of poles - three-phase equipment		N
3.4.8	Switches as disconnect devices	No switches provided.	N
3.4.9	Plugs as disconnect devices		N
3.4.10	Interconnected equipment	No interconnections using hazardous voltages.	N
3.4.11	Multiple power sources	One power source only.	N

3.5	Interconnection of equipment		P
3.5.1	General requirements	The product os connected to other circuits for UART transporting	P
3.5.2	Types of interconnection circuits	SELV.	P
3.5.3	ELV circuits as interconnection circuits	No ELV.	N

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict

3.5.4	Data ports for additional equipment	Coaxial cable	P
-------	-------------------------------------	---------------	---

4	Physical requirements		P
4.1	Stability		N
	Angle of 10°	Equipment with mass not exceeding 7kg and nor a floor-standing	N
	Test force (N)		N

4.2	Mechanical strength		P
4.2.1	General		P
	Rack-mounted equipment.	No rack-mounted equipment.	N
4.2.2	Steady force test, 10 N	No hazards	P
4.2.3	Steady force test, 30 N	No internal metal chassis	N
4.2.4	Steady force test, 250 N	No hazards	P
4.2.5	Impact test	movable equipment with a mass less then 5kg was subjected to drop test,see 4.2.6	N
	Fall test		N
	Swing test		N
4.2.6	Drop test; height (mm)		N
4.2.7	Stress relief test		N
4.2.8	Cathode ray tubes	No Cathode ray tubes	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)	Not intended for wall or ceiling mounted	N
4.2.11	Rotating solid media	No such parts rovided.	N
	Test to cover on the door.....		N

4.3	Design and construction		P
4.3.1	Edges and corners	All coners are smooth and rounded	P
4.3.2	Handles and manual controls; force (N).....	No knobs, grips, handles, lever etc.	N
4.3.3	Adjustable controls	No hazardous adjustable controls.	N
4.3.4	Securing of parts		N
4.3.5	Connection by plugs and sockets	No plugs and sockets	P
4.3.6	Direct plug-in equipment		N

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict
	Torque		—
	Compliance with the relevant mains plug standard		N
4.3.7	Heating elements in earthed equipment	No heating elements	N
4.3.8	Batteries	No batteries in the equipment.	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	No oil and grease	N
4.3.10	Dust, powders, liquids and gases		N
4.3.11	Containers for liquids or gases	No containers for liquids or gases in the equipment.	N
4.3.12	Flammable liquids	The equipment does not contain flammable liquid.	N
	Quantity of liquid (l)		N
	Flash point (°C)		N
4.3.13	Radiation	Refer below:	—
4.3.13.1	General	Refer below:	—
4.3.13.2	Ionizing radiation	The equipment does not generate ionizing 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	The equipment does not produce significant UV radiation.	N
	Part, property, retention after test, flammability classification		N
4.3.13.4	Human exposure to ultraviolet (UV) radiation	The equipment does not produce significant UV radiation.	N
4.3.13.5	Lasers (including laser diodes) and LEDs	Refer below EN 60825-1.	P
4.3.13.5.1	Lasers (including laser diodes)		N
	Laser class		—
4.3.13.5.2	Light emitting diodes (LEDs)		—
4.3.13.6	Other types	The equipment does not generate other types of radiation.	N

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict

4.4	Protection against hazardous moving parts		N
4.4.1	General	No moving parts	N
4.4.2	Protection in operator access areas	No moving parts	N
	Household and home/office document/media shredders	Not intended for installation in RAL.	N
4.4.3	Protection in restricted access locations	Unintentional contact is not likely in service access areas.	N
4.4.4	Protection in service access areas	No moving parts	N
4.4.5	Protection against moving fan blades		N
4.4.5.1	General		N
	Not considered to cause pain or injury. a)		N
	Is considered to cause pain, not injury. b)		N
	Considered to cause injury. c)		N
4.4.5.2	Protection for users		N
	Use of symbol or warning		N
4.4.5.3	Protection for service persons		N
	Use of symbol or warning		N

4.5	Thermal requirements		P
4.5.1	General	See below.	P
4.5.2	Temperature tests	(see appended table 4.5)	—
	Normal load condition per Annex L		P
4.5.3	Temperature limits for materials	(see appended table 4.5)	P
4.5.4	Touch temperature limits	(see appended table 4.5)	P
4.5.5	Resistance to abnormal heat		N

4.6	Openings in enclosures		N
4.6.1	Top and side openings	No openings	N
	Dimensions (mm)		—
4.6.2	Bottoms of fire enclosures		N
	Construction of the bottom, dimensions (mm) ...:		—
4.6.3	Doors or covers in fire enclosures		N
4.6.4	Openings in transportable equipment		N
4.6.4.1	Constructional design measures		N
	Dimensions (mm)		—
4.6.4.2	Evaluation measures for larger openings		N
4.6.4.3	Use of metallized parts		N

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict
4.6.5	Adhesives for constructional purposes		N
	Conditioning temperature (°C), time (weeks).....:		—

4.7	Resistance to fire		P
4.7.1	Reducing the risk of ignition and spread of flame	Method 1 used.	P
	Method 1, selection and application of components wiring and materials	Materials with the required flammability classes are used-see appended table 1.5.1 and 4.7	P
	Method 2, application of all of simulated fault condition tests	Method 2 is not used for the evaluation of the fire hazard.	N
4.7.2	Conditions for a fire enclosure	All the components mounted on rated V-0 PCB, used in metal enclosures and supplied by an DC source which max voltage is 12 V	P
4.7.2.1	Parts requiring a fire enclosure	See above	N
4.7.2.2	Parts not requiring a fire enclosure		N
4.7.3	Materials	PCB rated V-0	P
4.7.3.1	General		P
4.7.3.2	Materials for fire enclosures		N
4.7.3.3	Materials for components and other parts outside fire enclosures		N
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 assemblies	N
4.7.3.6	Materials used in high-voltage components	No high-voltage components	N

5	Electrical requirements and simulated abnormal conditions		P
5.1	Touch current and protective conductor current		N
5.1.1	General		N
5.1.2	Configuration of equipment under test (EUT)		N
5.1.2.1	Single connection to an a.c. mains supply	No interconnection of equipment.	N
5.1.2.2	Redundant multiple connections to an a.c. mains supply	No multiple power sources.	N
5.1.2.3	Simultaneous multiple connections to an a.c. mains supply		N
5.1.3	Test circuit		N
5.1.4	Application of measuring instrument		N
5.1.5	Test procedure		N
5.1.6	Test measurements		N

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict
	Supply voltage (V)		—
	Measured touch current (mA)		—
	Max. allowed touch current (mA)		—
	Measured protective conductor current (mA)		—
	Max. allowed protective conductor current (mA).....		—
5.1.7	Equipment with touch current exceeding 3,5 mA		N
5.1.7.1	General		N
5.1.7.2	Simultaneous multiple connections to the supply		N
5.1.8	Touch currents to telecommunication networks and cable distribution systems and from telecommunication networks	See below	N
5.1.8.1	Limitation of the touch current to a telecommunication network or to a cable distribution system		N
	Supply voltage (V)		—
	Measured touch current (mA)		—
	Max. allowed touch current (mA)		—
5.1.8.2	Summation of touch currents from telecommunication networks		N
	a) EUT with earthed telecommunication ports		N
	b) EUT whose telecommunication ports have no reference to protective earth		N

5.2	Electric strength		N
5.2.1	General		N
5.2.2	Test procedure		N

5.3	Abnormal operating and fault conditions		P
5.3.1	Protection against overload and abnormal operation	Considered	P
5.3.2	Motors	No motor	N
5.3.3	Transformers	No transformer	N
5.3.4	Functional insulation.....	Functional insulation complies with the requirements c)	P
5.3.5	Electromechanical components		N
5.3.6	Audio amplifiers in ITE	No audio amplifiers	N
5.3.7	Simulation of faults	(see appended table 5.3)	P
5.3.8	Unattended equipment	No thermostat, temperature limiter or thermal cut-out.	N
5.3.9	Compliance criteria for abnormal operating and fault conditions	(see appended table 5.3)	P

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict

5.3.9.1	During the tests		P
5.3.9.2	After the tests		P

6	Connection to telecommunication networks		N
6.1	Protection of telecommunication network service persons, and users of other equipment connected to the network, from hazards in the equipment		N
6.1.1	Protection from hazardous voltages		N
6.1.2	Separation of the telecommunication network from earth		N
6.1.2.1	Requirements	No TNV circuit.	N
	Supply voltage (V)		—
	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 the telecommunication wiring system from overheating		N
	Max. output current (A)		—
	Current limiting method		—

7	Connection to cable distribution systems		N
7.1	General	Not connected to Cable Distribution System.	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

Annex A	Tests for resistance to heat and fire	N
----------------	--	----------

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict
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).....:		—
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

Annex B	Motor tests under abnormal conditions (see 4.7.2.2 and 5.3.2)	N
----------------	--	----------

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict
B.1	General requirements	No motor	N
	Position		—
	Manufacturer		—
	Type		—
	Rated values.....		—
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
B.6.3	Alternative test procedure	No ignition of the wrapping tissue or cheesecloth.	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	No ignition of the wrapping tissue or cheesecloth.	N
B.7.4	Electric strength test; test voltage (V)		N
B.8	Test for motors with capacitors		N
B.9	Test for three-phase motors		N
B.10	Test for series motors		N
	Operating voltage (V)		—

Annex C	Transformers (see 1.5.4 and 5.3.3)		N
	Position		—
	Manufacturer		—
	Type		—
	Rated values		—
	Method of protection.....		—
C.1	Overload test		N
C.2	Insulation		N
	Protection from displacement of windings.....		N

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict

Annex D	Measuring instruments for touch-current testes(see 5.1.4)		N
D.1	Measuring instrument		N
D.2	Alternative measuring instrument		N

Annex E	Temperature rise of a winding (see 1.4.13)	N
----------------	---	----------

Annex F	Measurement of clearances and creepage distances (see 2.10 and Annex G)	N
----------------	--	----------

Annex G	Alternative method for determining minimum clearances		N
G.1	Clearances		N
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

Annex H	Ionizing radiation (see 4.3.13)	N
----------------	--	----------

Annex J	Table of electrochemical potentials (see 2.6.5.6)		N
	Metal(s) used		—

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict

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	(see appended table 5.3)	N

Annex L	Normal load conditions for same types of electrical business equipment (see 1.2.2.1 and 4.5.2)		P
L.1	Typewriters	Not used.	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		P

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

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

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict

Annex P	Normative references		—
----------------	-----------------------------	--	---

Annex Q	Voltage dependent resistors (VDRs) (see 1.5.9.1)		N
	a) Preferred climatic categories		N
	b) Maximum continuous voltage		N
	c) Pulse current		N

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

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

Annex T	Guidance on protection against ingress of water (see 1.1.2)		N
			—

Annex U	Insulated winding wires for use without interleaved insulation (see 2.10.5.4)		N
			—

Annex V	AC power distribution systems (see 1.6.1)		N
V.1	Introduction		N
V.2	TN power distribution systems		N

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

Annex X	Maximum heating effect in transformer tests (see clause C.1)		N
----------------	---	--	----------

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict
X.1	Determination of maximum input current		N
X.2	Overload test procedure		N
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
Annex Z	Overvoltage categories (see 2.10.3.2 and Clause G.2)		N
Annex AA	Mandrel test (see 2.10.5.8)		N
Annex BB	Changes in the second edition		—
Annex CC	Evaluation of integrated circuit (IC) current limiters		N
CC.1	General		N
CC.2	Test program 1		—
CC.3	Test program 2		—
Annex DD	Requirements for the mounting means of rack-mounted equipment		N
DD.1	General		N
DD.2	Mechanical strength test, variable N		—
DD.3	Mechanical strength test, 250N, including end stops		—
DD.4	Compliance.....		N
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
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)		—

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict
	Test with wedge probe (Figure EE1 and EE2)		—

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict
EN 60950-1:2006+A11:2009+A1:2010+A12:2011 – COMMON MODIFICATIONS			
Contents	Add the following annexes: Annex ZA (normative) Normative references to international publications with their corresponding European publications Annex ZB (normative) Special national conditions Annex ZC (informative) A-deviations		N
General	Delete all the “country” notes in the reference document 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		N
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		N
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 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.	See below	N
(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	Deleted	P

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict
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.	No Portable Sound System	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.	No Portable Sound System	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; c) it is permitted for PLUGGABLE EQUIPMENT 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.		N
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

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict
3.2.5.1	<p>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”.</p> <p>In Table 3B, replace the first four lines by the following:</p> <p> 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 </p> <p>In the conditions applicable to Table 3B delete the words “in some countries” in condition^{a)}.</p> <p>In NOTE 1, applicable to Table 3B, delete the second sentence.</p>		N
3.3.4	<p>In Table 3D, delete the fourth line: conductor sizes for 10 to 13 A, and replace with the following:</p> <p> Over 10 up to and including 16 1,5 to 2,5 1,5 to 4 </p> <p>Delete the fifth line: conductor sizes for 13 to 16 A.</p>		N
4.3.13.6 (A1:2010)	<p>Replace the existing NOTE by the following:</p> <p>NOTE Z1 Attention is drawn to:</p> <p>1999/519/EC: Council Recommendation on the limitation of exposure of the general public to electromagnetic fields 0 Hz to 300 GHz, and</p> <p>2006/25/EC: Directive on the minimum health and safety requirements regarding the exposure of workers to risks arising from physical agents (artificial optical radiation).</p>		N
	<p>Standards taking into account mentioned Recommendation and Directive which demonstrate compliance with the applicable EU Directive are indicated in the OJEC.</p>		N
Annex H	<p>Replace the last paragraph of this annex by:</p> <p>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.</p> <p>Replace the notes as follows:</p> <p>NOTE These values appear in Directive 96/29/Euratom.</p> <p>Delete NOTE 2.</p>	The unit does not emit X-ray radiation.	N
Bibliography	Additional EN standards.		—
ZA	NORMATIVE REFERENCES TO INTERNATIONAL PUBLICATIONS WITH THEIR CORRESPONDING EUROPEAN PUBLICATIONS		—

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict

ZB ANNEX (normative) SPECIAL NATIONAL CONDITIONS (EN)			
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
1.5.7.1	In Finland, Norway and Sweden , resistors bridging BASIC INSULATION in CLASS I PLUGGABLE EQUIPMENT TYPE A must comply with the requirements in 1.5.7.2.	No such Resistors.	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.	No such component.	N

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict
1.7.2.1	<p>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 a marking stating that the equipment must be connected to an earthed mains socket-outlet.</p> <p>The marking text in the applicable countries shall be as follows:</p> <p>In Finland: "Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan"</p> <p>In Norway: "Apparatet må tilkoples jordet stikkontakt"</p> <p>In Sweden: "Apparaten skall anslutas till jordat uttag"</p> <p>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.</p> <p>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.</p> <p>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:</p> <p>"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)."</p> <p>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):</p> <p>"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."</p>		N

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>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.”</p>		N
1.7.5	<p>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.</p> <p>For CLASS II EQUIPMENT the socket outlet shall be in accordance with Standard Sheet DKA 1-4a.</p>		N
2.2.4	<p>In Norway, for requirements see 1.7.2.1, 6.1.2.1 and 6.1.2.2 of this annex.</p>	No TNV circuits.	N
2.3.2	<p>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.</p>	No TNV circuits.	N
2.3.4	<p>In Norway, for requirements see 1.7.2.1, 6.1.2.1 and 6.1.2.2 of this annex.</p>	No TNV circuits.	N
2.6.3.3	<p>In the United Kingdom, the current rating of the circuit shall be taken as 13 A, not 16 A.</p>		N
2.7.1	<p>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.</p>		N
2.10.5.13	<p>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.</p>	No TNV circuits.	N

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict
3.2.1.1	<p>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:</p> <p>SEV 6532-2.1991 Plug Type 15 3P+N+PE 250/400 V, 10 A</p> <p>SEV 6533-2.1991 Plug Type 11 L+N 250 V, 10 A</p> <p>SEV 6534-2.1991 Plug Type 12 L+N+PE 250 V, 10 A</p> <p>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:</p> <p>SEV 5932-2.1998 Plug Type 25 3L+N+PE 230/400 V, 16 A</p> <p>SEV 5933-2.1998 Plug Type 21 L+N 250 V, 16 A</p> <p>SEV 5934-2.1998 Plug Type 23 L+N+PE 250 V, 16 A</p>		N
3.2.1.1	<p>In Denmark, supply cords of single-phase equipment having a rated current not exceeding 13 A shall be provided with a plug according to the Heavy Current Regulations, Section 107-2-D1.</p> <p>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.</p> <p>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.</p>		N
3.2.1.1	<p>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.</p> <p>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.</p> <p>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.</p> <p>If poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance with UNE-EN 60309-2.</p>		N

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict
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 mm ² is allowed for equipment with a rated current over 10 A and up to and including 13 A.		N
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

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict
5.1.7.1	<p>In Finland, Norway and Sweden TOUCH CURRENT measurement results exceeding 3,5 mA r.m.s. are permitted only for the following equipment:</p> <ul style="list-style-type: none"> • STATIONARY PLUGGABLE EQUIPMENT TYPE A that <ul style="list-style-type: none"> ○ 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			
Clause	Requirement + Test	Result - Remark	Verdict
6.1.2.1 (A1:2010)	<p>In Finland, Norway and Sweden, add the following text between the first and second paragraph of the compliance clause:</p> <p>If this insulation is solid, including insulation forming part of a component, it shall at least consist of either</p> <ul style="list-style-type: none"> - 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. <p>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</p> <ul style="list-style-type: none"> - 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. <p>It is permitted to bridge this insulation with an optocoupler complying with 2.10.5.4 b).</p> <p>It is permitted to bridge this insulation with a capacitor complying with EN 60384-14:2005, subclass Y2.</p> <p>A capacitor classified Y3 according to EN 60384-14:2005, may bridge this insulation under the following conditions:</p> <ul style="list-style-type: none"> - 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. 	No TNV circuits.	N


EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
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 , there are many buildings where the screen of the coaxial cable is normally not connected to the earth in the building installation.		N
7.3	In Norway , for installation conditions see EN 60728-11:2005.		N

Annex ZC (informative) A-deviations			
1.5.1	Switzerland (Ordinance on environmentally hazardous substances SR 814.081, Annex 1.7, Mercury - Annex 1.7 of SR 814.81 applies for mercury.) Add the following: NOTE In Switzerland, switches containing mercury such as thermostats, relays and level controllers are not allowed.		N
1.7.2.1	Germany (Gesetz über technische Arbeitsmittel und Verbraucherprodukte (Geräte- und Produktsicherheitsgesetz – GPSG) [Law on technical labour equipment and consumer products], of 6th January 2004, Section 2, Article 4, Clause (4), Item 2). If for the assurance of safety and health certain rules during use, amending or maintenance of a technical labour equipment or readymade consumer product are to be followed, a manual in German language has to be delivered when placing the product on the market. Of this requirement, rules for use even only by SERVICE PERSONS are not exempted.		N
1.7.13	Switzerland (Ordinance on chemical hazardous risk reduction SR 814.81, Annex 2.15 Batteries) Annex 2.15 of SR 814.81 applies for batteries.		N

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict

Annex Zx (informative) Protection against excessive sound pressure from personal music players			
	<p>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.</p> <p>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 uses headphones or earphones that can be worn in or on or around the ears; and allows the user to walk around while in use. 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.</p> <p>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.</p> <p>The requirements in this sub-clause are valid for music or video mode only. The requirements do not apply: while the personal music player is connected to an external amplifier; or while the headphones 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.</p> <p>The requirements do not apply to: hearing aid equipment and professional equipment; NOTE 3 Professional equipment is equipment sold through special sales channels. All products sold through normal electronics stores are considered not to be professional equipment.</p> <p>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.</p> <p>For equipment which is clearly designed or intended for use by young children, the limits of EN 71-1 apply.</p>	<p>No sound equipment</p>	<p>N</p>

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>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 fixed “programme simulation noise” as described in EN 50332-1.</p> <p>NOTE 1 Wherever the term acoustic output is used in this clause, the 30 s A-weighted equivalent sound pressure level $L_{Aeq,T}$ is meant. See also Zx.5 and Annex Zx.</p> <p>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</p> <p>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.</p> <p>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</p>		N

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>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.</p> <p>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. 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.</p>		N
	<p>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.”</p> <div style="text-align: center;">  </div> <p>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.</p>		N
	Zx.4 Requirements for listening devices (headphones and earphones)		N
	<p>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.</p>		N

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>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 level), the acoustic output $L_{Aeq,T}$ of the listening device shall be ≤ 100 dBA.</p> <p>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.).</p> <p>NOTE An example of a wired listening device with digital input is a USB headphone.</p>		N
	<p>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 $L_{Aeq,T}$ of the listening device shall be ≤ 100 dBA.</p> <p>NOTE An example of a wireless listening device is a Bluetooth headphone.</p>		N
	<p>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.</p> <p>NOTE Test method for wireless equipment provided without listening device should be defined.</p>		N

EN 60825-1:2007

Clause	Requirement + Test	Result - Remark	Verdict
4	Engineering specifications		P
4.1	General remarks		P
4.1.1	Modification	No previously classified laser product	N
4.2	Protective housing		P
4.2.1	General	Class I laser product.	P
4.2.2	Service		P
4.2.3	Removable laser system	Considered	P
4.3	Access panels and safety interlocks		N
4.3.1	Access panels of protective housing		N
	Product Class	Class I laser product	N
	Accessible emission during removal of access panel		N
	The access panel intended to be removed during maintenance or operation		N
	The removal of the panel gives access to laser radiation levels designated by "X" in the TABLE		N
	Accessible emissions after removal		N
4.3.2	Deliberate override mechanism		N
4.4	Remote interlock connector		N
4.5	Manual reset	No manual reset	N
4.6	Key control	No key control	N
4.7	Laser radiation emission warning		P
4.7.1	Class 3R ($\lambda < 400$ nm; $\lambda > 700$ nm), 3B and 4	Class I laser product	N
4.7.2	Audible or visible warning	Class I laser product	N
4.7.3	Operational control and laser aperture	No radiation warning device	N
4.7.4	Laser emission distributed through more than one output		N
4.8	Beam stop or attenuation		N
4.9	Controls	No such controls	N
4.10	Viewing optics		N
	a) Human access to laser radiation in excess of Class 1M prevented when the shutter is opened or attenuation varied		N
	b) Opening of the shutter or variation of the attenuation prevented when exposure to laser radiation in excess of Class 1M is possible		N
4.11	Scanning safeguard		N

EN 60825-1:2007			
Clause	Requirement + Test	Result - Remark	Verdict
4.12	Walk-in access		N
	a). Means provided so that any person inside the housing can prevent activation of a Class 3B or 4 laser hazard		N
	b). A warning device provides adequate warning of emission to any person within the housing		N
4.13	Environmental conditions	Complied with IEC 60601-1 requirements	P
	- climatic conditions	Considered.	P
	- vibration and shock	Considered.	P
4.14	Protection against other hazards	Hazards except for radiation evaluated according to EN60950-1	P
4.14.1	Non-optical hazards		P
	- electrical hazards;		---
	- excessive temperature;		---
	- spread of fire from the equipment;		---
	- sound and ultrasonic;		---
	- harmful substances;		---
	- explosion;		---
4.14.2	Collateral radiation	Not applicable.	N
5	Labelling		P
5.1	General		P
	Laser Product Class	Class I laser product.	P
5.2	Class 1 explanatory label provided on the product		P
	Optional: Class 1 explanatory label provided in the user manual		P
	Class 1M explanatory label provided on the product		N
	Optional: Class 1M explanatory label provided in the user manual		N
5.3	Class 2 explanatory and warning label		N
	Class 2M explanatory and warning label		N
5.4	Class 3R explanatory and warning label		N
5.5	Class 3B explanatory and warning label		N
5.6	Class 4 explanatory and warning label		N
5.7	Aperture label		P
5.8	Radiation output and standards information		N
	Maximum output of laser radiation	Class I laser product.	N

EN 60825-1:2007			
Clause	Requirement + Test	Result - Remark	Verdict
	Pulse duration		N
	Emitted wavelength (s)		N
	The name and publication date of the standard	EN60825-1:2007	P
5.9	Labels for access panels		N
	RADIATION CLASS		N
5.9.1	Labels for panels		N
	Warning used		N
5.9.2	Labels for safety interlocked panels		N
	Warning used	Not applicable	N
5.10	Warning for invisible laser radiation		N
5.11	Warning for visible laser radiation		N
6	Other informational requirements		N
6.1	Information for the user		N
	a) adequate instructions for proper assembly, maintenance and safe use		N
	b) warning for Class 1M and 2M		N
	c) laser beam parameters		N
	d) reproduction of labels		N
	e) location of laser apertures		N
	f) listing of controls, adjustment of procedures and warning statement		N
	g) information about laser energy source if not incorporated in the manual		N
6.2	Purchasing and service information		N
	a). Safety classification of each laser product stated in descriptive material		N
	b). Adequate instructions for servicing available		N
7	Additional requirements for specific laser products		P
7.1	Other parts of the standard series EN 60825		N
7.2	Medical laser products		N
	Class 3B and Class 4 medical laser products comply with IEC 60601-2-22		N
	Medical laser products provided with instructions for calibration of measurement system		N
7.3	Laser processing machines		N

EN 60825-1:2007

Clause	Requirement + Test	Result - Remark	Verdict
7.4	Electric toys		N
7.5	Consumer electronic products		N
8	Classification		P
8.1	Introduction		P
8.2	Classification responsibilities.	Classified according to the highest appropriate class.	P
8.3	Classification rules	As specified.	P
8.3a	Radiation of a single wavelength		N
8.3b	Radiation of multiple wavelengths		N
	1). Laser product emission two or more wavelengths in spectral regions shown as additive in TABLE 2		N
	2). Laser product emission two or more wavelengths in spectral regions not shown as additive in TABLE 2		N
8.3c	Radiation from extended sources		N
	Value of angular subtense α (mrad)		N
8.3d	Non-circular and multiple sources		N
8.3e	Time basis	0.25s	P
	i) 0.25s		P
	ii) 100s		N
	iii) 30000s		N
8.3f	Repetitively pulsed or modulated lasers		N
	i) exposure from a single pulse not exceeding the AEL for a single pulse		N
	ii) average power for a pulse train		N
	iii) the average pulse energy from pulses within a pulse train not exceeding the AEL for a single pulse multiplied by the correction factor C5		N
	AEL for continued operation used		N
	Total-on-time-pulse (TOTP) method used		N
9	Measurements for classification		P
9.1	Tests		P
9.2	Measurement condition		P
	Measurement laser radiation		P
9.3	Measurement geometry		P
	a) aperture diameter (mm)		P
	b) measurement distance (mm)		P

EN 60825-1:2007

Clause	Requirement + Test	Result - Remark	Verdict
	c) angle of acceptance		P
	i) photochemical limits		N
	ii) all other limits		P

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	WuJiang YanShi Electronics Element Factory	ONU-1-04	V-0 or better,Min.120°C	UL796	UL	
¹) An asterisk indicates a mark which assures the agreed level of surveillance						
Supplementary information:						

1.5.2	TABLE: Opto Electronic Devices	N
Manufacturer.....: -- Type.....: -- Separately tested.....: N/A Bridging insulation.....: -- External creepage distance.....: -- Internal creepage distance.....: -- Distance through insulation.....: -- Tested under the following conditions.....: --		
Input.....: -- Output.....: --		
Supplementary information:		

1.6.2	TABLE: Electrical data (in normal conditions)	P				
Input(for adapter)				Fuse #	Ifuse (A)	Condition/status
U (V)	P(W)	I(mA)	Irated(mA)	---	---	---
Normal operation						
12	2	170	1000	---	---	The product work fully and supplied by DC source.
Supplementary information:						

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)
Supplementary information:				

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

2.2	TABLE: evaluation of voltage limiting components in SELV circuits			N
Component (measured between)		max. voltage (V) (normal operation)		Voltage Limiting Components
		V peak	V d.c.	
		---	---	
Fault test performed on voltage limiting components		Voltage measured (V) in SELV circuits (V peak or V d.c.)		
Supplementary information:				

2.4.2	TABLE: limited current circuit measurement				N
Location	Voltage (V)	Current (mA)	Freq. (KHz)	Limit (mA)	
Supplementary information:					

2.5	TABLE: limited power sources				N
Circuit output tested:					
Measured Uoc (V) with all load circuits disconnected					
		I _{sc} (A)		VA	
		Meas.	Limit	Meas.	Limit
Supplementary information:					
*) Unit shut down.					

2.10.2	Table: working voltage measurement			N
Location	Peak voltage (V)	RMS voltage (V)	Comments	
Supplementary information:				
The highest measured working voltages in transformer are indicated with bold characters.				

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:							
See appended table C.2 for internal distances of transformer.							
1)One layer of mylar sheet between primary component pins and secondary component pins.							

2.10.5	TABLE: Distance through insulation measurements					N
Distance through insulation (DTI) at/of:	U peak (V)	U rms (V)	Test voltage (V)	Required DTI (mm)	DTI (mm)	
Supplementary information:						
No flash over or insulation breakdown after test.						

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	---	---	---	---	---	---	---	---	---	
Test results:										Verdict
- Chemical leaks										
- Explosion of the battery										
- Emission of flame or expulsion of molten metal										
- Electric strength tests of equipment after completion of tests										
Supplementary information:										

4.5	TABLE: Thermal requirements			P
	test voltage (V)	10.2V DC	14.4V DC	—
	t1(°C)	22.8	22.4	
	Maximum measured temperature T of part/at:	T(°C)		Allowed T _{max} (°C)
	C70 body	64.5	65	105
	J1 body	61.3	61.3	—
	L3 coil	68.2	68.3	110
	L3 core	65.5	65.6	110
	Terminal tube	65.1	65.2	75
	U3 near PCB	69.4	69.5	110
	Terminal body	61.4	61.5	—
	R19 body	67.4	67.6	—
	Metal enclosure	61	61.2	70
	Ambient	50	50	—
Supplementary information:				
Having a specified maximum ambient temperature of 50°C, Temp. Limits are adjusted according to Cl.1.4.12.3.				

4.5.5	TABLE: Ball pressure test of thermoplastic parts			N
	Allowed impression diameter (mm)	≤ 2 mm		—
	Part	Test temperature (°C)	Impression diameter (mm)	
Supplementary information:				

4.7	TABLE: Resistance to fire					N
	Part	Manufacturer of material	Type of material	Thickness (mm)	Flammability class	Evidence
Supplementary information:Supplementary information:See Appendix Table 1.5.1						

5.1	TABLE: touch current measurement			N
Measured between:	Measured (mA)	Limit (mA)	Comments/conditions	
Supplementary information:				

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

5.3	TABLE: Fault condition tests					P
	Ambient temperature (°C)				22.4	—
	Power source for EUT: Manufacturer, model/type, output rating :				See appendix table 1.5.1	—
Component No.	Fault	Supply voltage (V)	Test time	Fuse #	Fuse current(A)	Observation
U3(Pin2-Pin3)	S-C	DC 12V	3.5 hours	---	---	NCD, NFG,NHT Pass
D1(Pin+ to Pin-)	S-C	DC 12V	3.5 hours	---	---	NCD, NFG,NHT Pass
U2(Pin1-Pin3)	S-C	DC 12V	3.5 hours	---	---	NCD, NFG,NHT Pass
L1(Pin1-Pin2)	S-C	DC 12V	3.5 hours	---	---	NCD, NFG,NHT Pass
C70(Pin+ to Pin-)	S-C	DC 12V	3.5 hours	---	---	NCD, NFG,NHT Pass
Supplementary information:						
S-C=Short circuit, O-C=Open circuit, O-L=Overload.						
NHT: No High Temperature; NCD: No Component Damage; NFG no flammability gas.						
1)Fuse current is more than fuse rating times 2.1.						

C.2	TABLE: transformers						N
Loc.	Tested insulation	Working voltage peak / V (2.10.2)	Working voltage rms / V (2.10.2)	Required electric strength (5.2)	Required clearance / mm (2.10.3)	Required creepage distance / mm(2.10.4)	Required distance thr. insul. (2.10.5)
Loc.	Tested insulation			Test voltage/ V	Measured clearance / mm	Measured creepage dist./ mm	Measured distance thr. insul. / mm; number of layers

Supplementary information:
*) Annex U

Appendix A – EUT PHOTOS

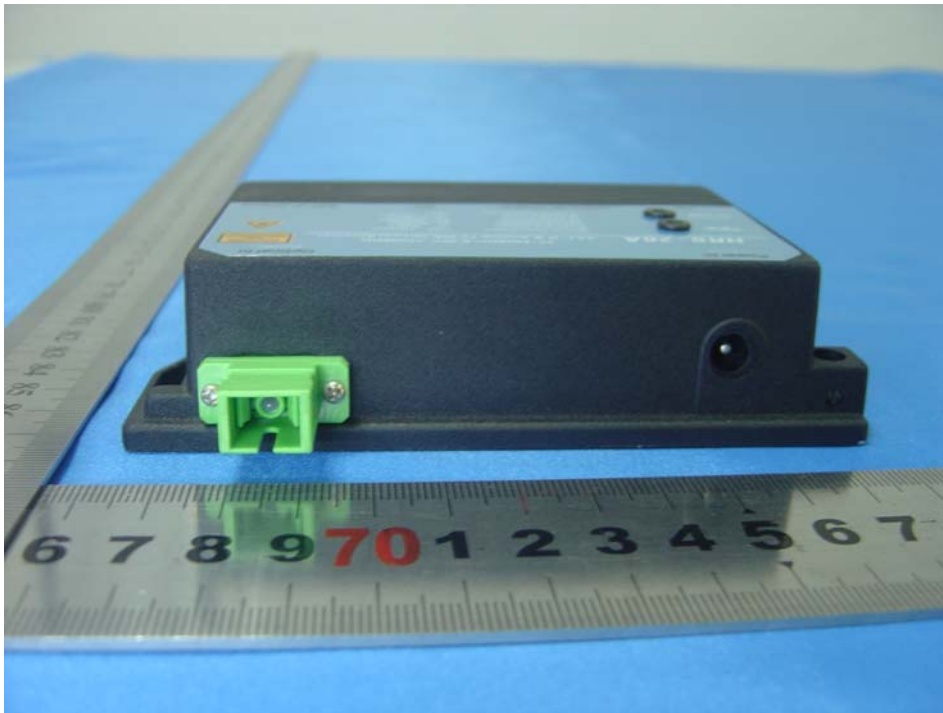
Appendix A.1 EUT – All View



Appendix A.2 EUT – Front View



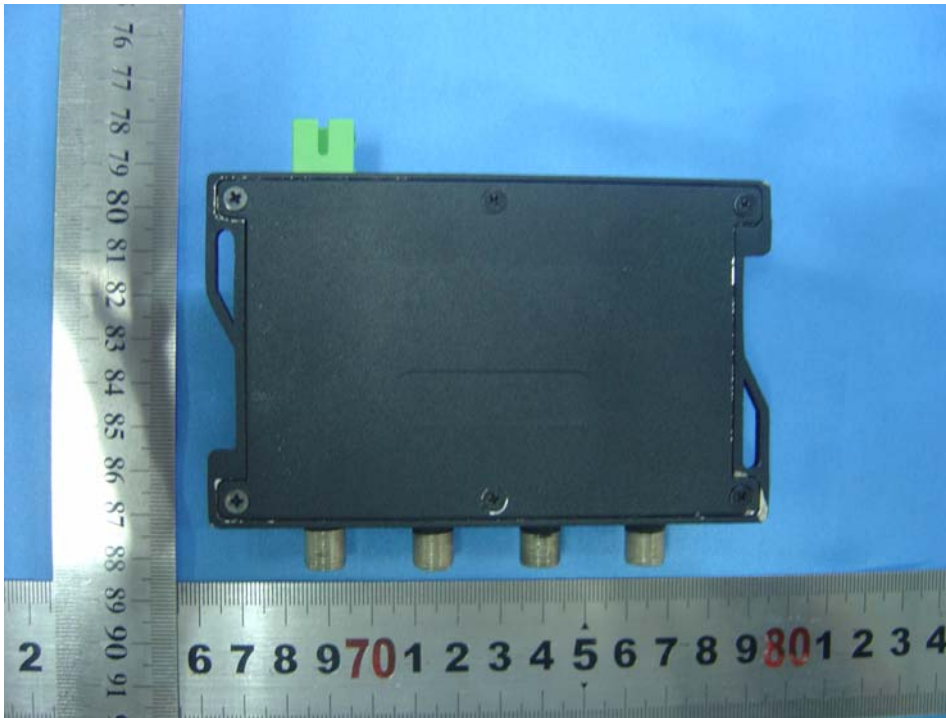
Appendix A.3 EUT – Rear View



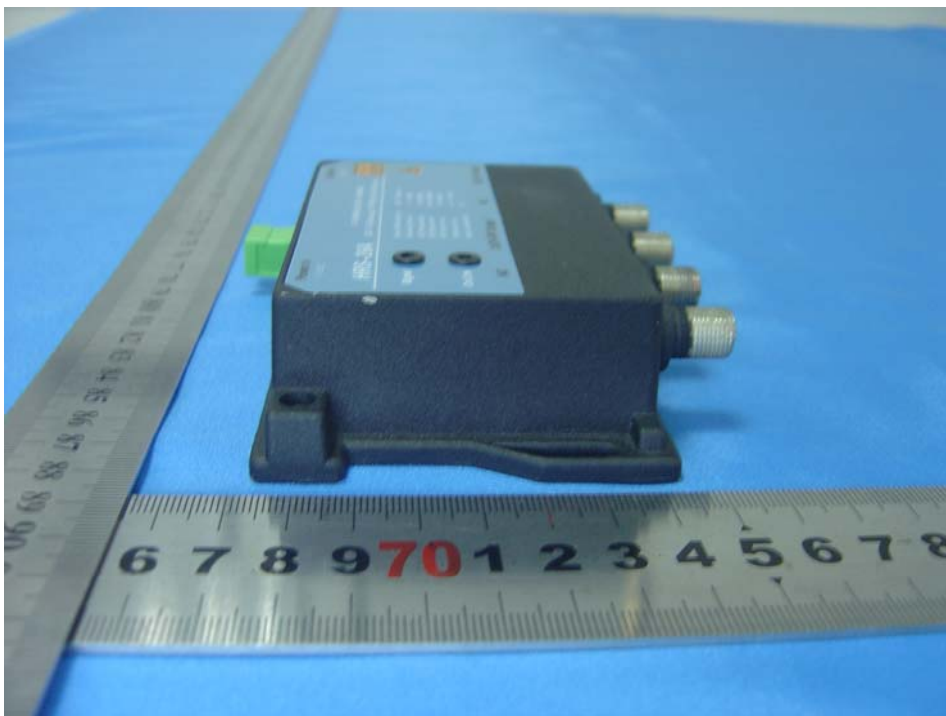
Appendix A.4 EUT – Top View



Appendix A.5 EUT – Bottom View



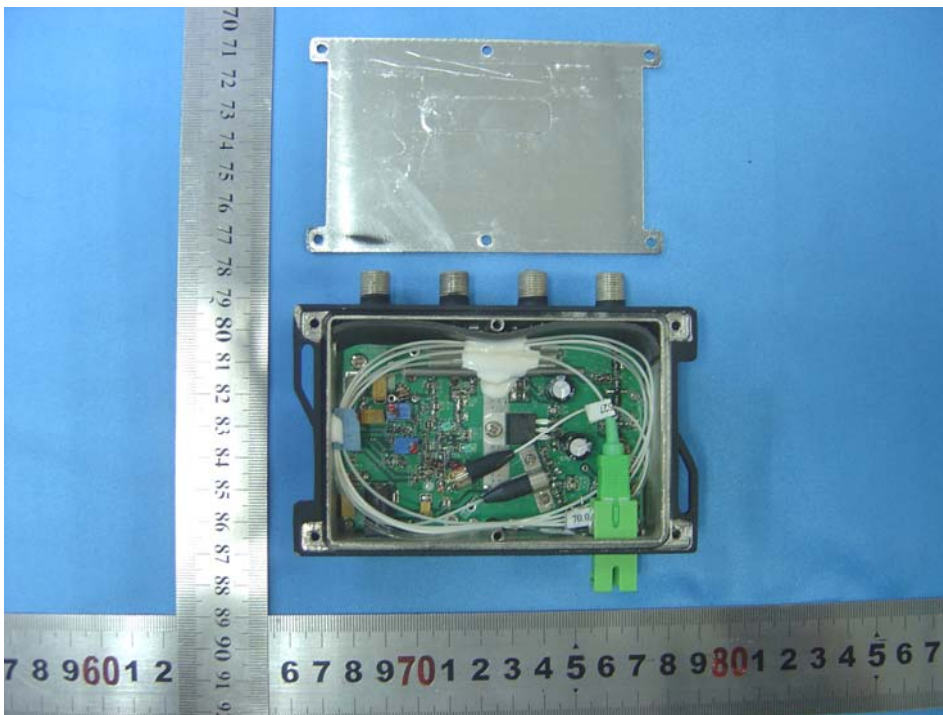
Appendix A.6 EUT – Left View



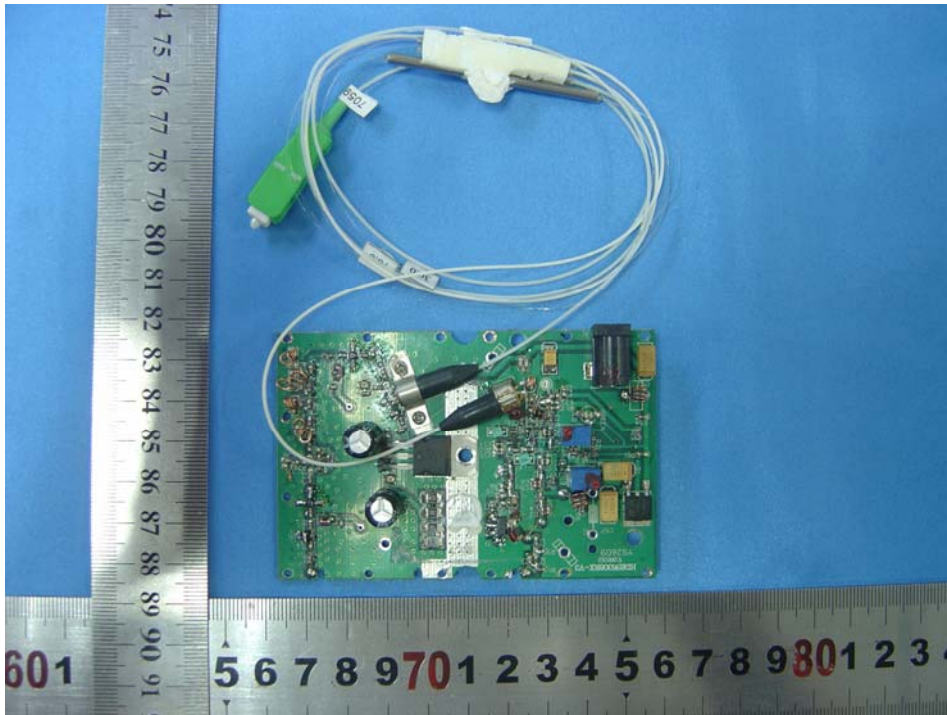
Appendix A.7 EUT – Right View



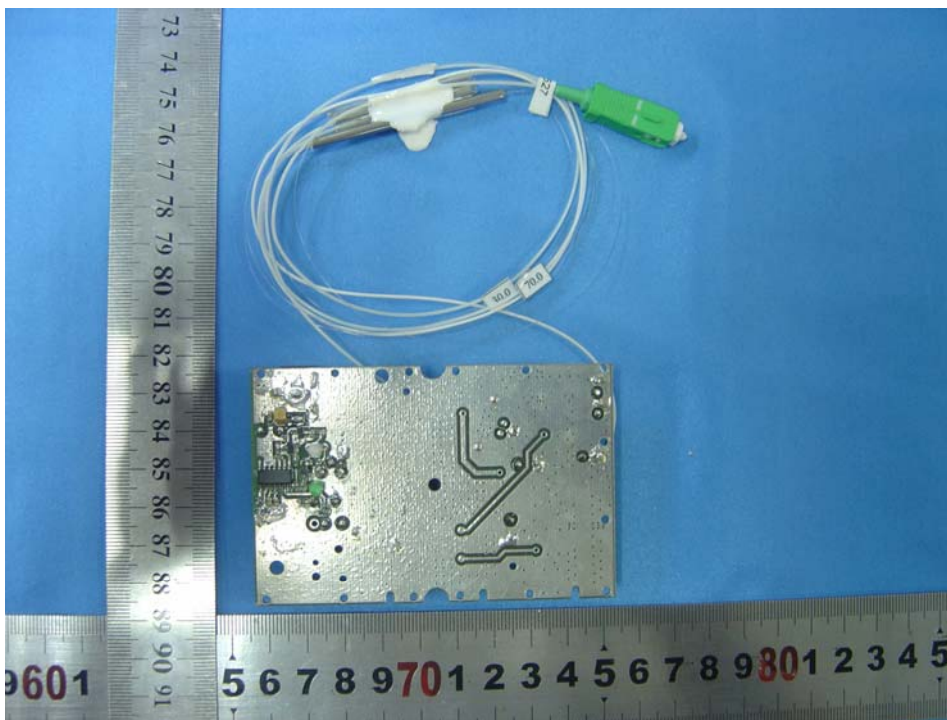
Appendix A.8 EUT – Inside Structure View



Appendix A.9 EUT – Main Board Top View



Appendix A.10 EUT – Main Board Bottom View



Appendix A.11 Power Adapter View



Appendix B – Technical Specification

**Appendix C – Circuit Diagram & Block Diagram
& PCB Layout Diagram**

Appendix D – Test Equipment List

Appendix E – Declaration Letter

Declaration Letter

We declare that the layout of PCB and internal structures for HRS-26 and HDS-26 are the same. They just have different appearance, model names and output level. We'll be responsible for any consequences caused by other differences between the models.

Please kindly handle on the project.

Thank you!

Sincerely,

Applicant's Signature:



Printed Name: 余茜

Company Name and Address: **Hangzhou Huatai Optic Tech. Co., Ltd.**

2-2-4/F, 224 Tianmushan Road, Hangzhou 310012, P.R,China