

	Test Report issued under the responsibility of: NCB TÜV SÜD PSB 1 Science Park Drive, 118221 Singapore Singapore	
TEST REPORT IEC 60950-1 Information technology equipment – Safety – Part 1: General requirements		
Report Number: 64.210.11.00477.01 Rev.00 Date of issue: 2012-09-12 Total number of pages 41 pages		
Testing Laboratory: Jiangsu TÜV Product Service Ltd. Guangzhou Branch Address: 5F, Communication Building, 163 Pingyun Rd, Huangpu Ave. West Guangzhou 510656 P. R. China		
Applicant's name: Gembird Electronics Ltd. Address: Floor 5 th , Building B, Shifeng Science Technical Zone, Huaning Road, Dalang Street, Bao An, 518129 Shenzhen, Guangdong, People's Republic of China		
Manufacturer's name: Same as applicant Address: Same as applicant		
Test specification: Standard: EN 60950-1:2006+A11:2009 + A1:2010+ A12: 2011		
Test procedure: -- Non-standard test method: N/A		
Test Report Form No.: IEC60950_1B Test Report Form(s) Originator: SGS Fimko Ltd Master TRF: Dated 2010-04		
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Test item description : USB Adaptor (Building-in portable socket-outlets) Trade Mark: -- Manufacturer: Same as applicant Model/Type reference: UC-1A, UC-2A Ratings: Input: 250 Vac, 50 Hz, 0,18 A Output: 5,0Vd.c./ 1,0A for UC-1A; 5,0Vd.c./ 2,0A for UC-2A		



Testing procedure and testing location:		
<input checked="" type="checkbox"/> CB Testing Laboratory:	Jiangsu TÜV Product Service Ltd. Guangzhou Branch	
Testing location/ address.....:	5F, Communication Building, 163 Pingyun Rd, Huangpu Ave. West Guangzhou 510656 P. R. China	
Tested by (name + signature)	Mr. Honder Kang	
Approved by (name + signature).....:	Mr. Snowman Zhao	
List of Attachments:		
Attachment No.1: 16 pages of European group differences and national differences for EN 60950-1: 2006/A11: 2009/A1: 2010/A12: 2011;		
Summary of testing:		
The selected models for test are the most representative:		
Model type	Performed test	
UC-1A	Full test	
UC-2A	Full test	
Tests performed (name of test and test clause):	Testing location:	
The submitted samples were tested and found to comply with the requirements of: - IEC 60950-1:2005 + A1:2009 - EN 60950-1:2006+A11:2009 + A1:2010+ A12: 2011	Jiangsu TÜV Product Service Ltd. Guangzhou Branch 5F, Communication Building, 163 Pingyun Rd, Huangpu Ave. West Guangzhou 510656 P. R. China	
Summary of compliance with National Differences:		
List of countries addressed: National Differences and Group Differences as per CB bulletin. See attachment of National and Group Differences for details		
<input checked="" type="checkbox"/> The product fulfils the requirements of <u>EN 60950-1:2006+A11:2009 + A1:2010+ A12: 2011.</u>		

Copy of marking plates(representative):
The USB adator is designed to incorporated in portable socket outlet, for the marking label please see main test report of end products.

Test item particulars	
Equipment mobility	<input type="checkbox"/> movable <input type="checkbox"/> hand-held <input type="checkbox"/> transportable <input type="checkbox"/> stationary <input checked="" type="checkbox"/> for building-in <input type="checkbox"/> direct plug-in
Connection to the mains	<input checked="" type="checkbox"/> pluggable equipment <input checked="" 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 type="checkbox"/> not directly connected to the mains
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 (%) or absolute mains supply values	+10%, -10% (required by the applicant)
Tested for IT power systems	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
IT testing, phase-phase voltage (V)	230V (only for Norway)
Class of equipment	<input type="checkbox"/> Class I <input checked="" type="checkbox"/> Class II <input type="checkbox"/> Class III <input type="checkbox"/> Not classified
Considered current rating of protective device as part of the building installation (A)	16A
Pollution degree (PD)	<input type="checkbox"/> PD 1 <input checked="" type="checkbox"/> PD 2 <input type="checkbox"/> PD 3
IP protection class	IP00
Altitude during operation (m)	< 2000 m
Altitude of test laboratory (m)	< 500
Mass of equipment (kg)	Approx. 0,25kg
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	2011-09-27
Date(s) of performance of tests	2011-09-27 to 2011-12-26
General remarks:	
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 Issuing testing laboratory. "(see Enclosure #)" refers to additional information appended to the report. "(see appended table)" refers to a table appended to the report.	
Throughout this report a <input checked="" type="checkbox"/> comma / <input type="checkbox"/> point is used as the decimal separator.	



Manufacturer's Declaration per sub-clause 6.2.5 of IEC 60950-1:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided..... : Yes Not applicable

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies) : Gembird Electronics Ltd.
 Floor 5th, Building B, Shifeng Science Technical Zone, Huaning Road, Dalang Street, Bao An, 518129 Shenzhen, Guangdong, People's Republic of China

General product information:

1. The building-in USB charger is designed to incorporate in portable socket outlet, in this report the charger was evaluated only and ambient temperature is 45°C Max.
2. The equipment is in compliance with the requirements of sub-clause 2.5 (Limited power sources).
3. In normal heating test, the USB charger UC-1A was tested within the socket outlet model EG-SP5-TNCU6B-RM; the USB charger UC-2A was tested within the socket outlet model EG-SP5-U6B-RM.

Difference between models:

The models are identical except the circuit diagram, PCB layout and rated output current.

Abbreviations used in the report:

- normal conditions	N.C.	- single fault conditions	S.F.C
- functional insulation	OP	- basic insulation	BI
- double insulation	DI	- supplementary insulation	SI
- between parts of opposite polarity	BOP	- reinforced insulation	RI

Indicate used abbreviations (if any)

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1	GENERAL		P
1.5	Components		P
1.5.1	General	Components which were found to affect safety aspects comply with the requirements of this standard or within the safety aspects of the relevant IEC component standards.	P
	Comply with IEC 60950-1 or relevant component standard	(see appended tables 1.5.1)	P
1.5.2	Evaluation and testing of components	Components which are certified to IEC and /or national standards are used correctly within their ratings. Components not covered by IEC standards are tested under the conditions present in the equipment.	P
1.5.3	Thermal controls	No thermal controls provided.	N/A
1.5.4	Transformers	Comply with annex C	P
1.5.5	Interconnecting cables		N/A
1.5.6	Capacitors bridging insulation	Y1 capacitor(CY, Y1) across primary circuit and secondary circuit	P
1.5.7	Resistors bridging insulation		N/A
1.5.7.1	Resistors bridging functional, basic or supplementary insulation		N/A
1.5.7.2	Resistors bridging double or reinforced insulation between a.c. mains and other circuits		N/A
1.5.7.3	Resistors bridging double or reinforced insulation between a.c. mains and antenna or coaxial cable		N/A
1.5.8	Components in equipment for IT power systems	Only for Norway	P
1.5.9	Surge suppressors		N/A
1.5.9.1	General		N/A
1.5.9.2	Protection of VDRs		N/A
1.5.9.3	Bridging of functional insulation by a VDR		N/A
1.5.9.4	Bridging of basic insulation by a VDR		N/A
1.5.9.5	Bridging of supplementary, double or reinforced insulation by a VDR		N/A
1.6	Power interface		P
1.6.1	AC power distribution systems	TN & IT(only for Norway) power distribution system	P



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Clause	Requirement + Test	Result - Remark	Verdict
1.6.2	Input current	Highest load according to 1.2.2.1 for this equipment is the operation with the max. Specified DC-load. (see appended table 1.6.2)	P
1.6.3	Voltage limit of hand-held equipment		N/A
1.6.4	Neutral conductor		P

1.7	Marking and instructions		P
1.7.1	Power rating and identification markings		P
1.7.1.1	Power rating marking		P
	Multiple mains supply connections.....:	Only one mains supply connection	N/A
	Rated voltage(s) or voltage range(s) (V)	250V~	P
	Symbol for nature of supply, for d.c. only.....:	Mains from AC source	N/A
	Rated frequency or rated frequency range (Hz) ...:	50Hz	P
	Rated current (mA or A)	0,18A	P
1.7.1.2	Identification markings		P
	Manufacturer's name or trade-mark or identification mark		N/A
	Model identification or type reference	UC-1A, UC-2A	P
	Symbol for Class II equipment only		N/A
	Other markings and symbols		N/A
1.7.2	Safety instructions and marking		P
1.7.2.1	General		P
1.7.2.2	Disconnect devices	Depend on end products	N/A
1.7.2.3	Overcurrent protective device	Pluggable equipment type A	N/A
1.7.2.4	IT power distribution systems	Only for Norway	P
1.7.2.5	Operator access with a tool	No such area	N/A
1.2.7.6	Ozone		N/A
1.7.3	Short duty cycles	Continuous	N/A
1.7.4	Supply voltage adjustment	Only one supply voltage range	N/A
	Methods and means of adjustment; reference to installation instructions		N/A
1.7.5	Power outlets on the equipment	No outlet used	N/A
1.7.6	Fuse identification (marking, special fusing characteristics, cross-reference)	Fuse marking on PCB near F1: "T1.0AL/ 250V"	P
1.7.7	Wiring terminals	No such terminals	N/A
1.7.7.1	Protective earthing and bonding terminals		N/A
1.7.7.2	Terminals for a.c. mains supply conductors		N/A
1.7.7.3	Terminals for d.c. mains supply conductors		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
1.7.8	Controls and indicators	No switch used	N/A
1.7.8.1	Identification, location and marking		N/A
1.7.8.2	Colours		N/A
1.7.8.3	Symbols according to IEC 60417.....		N/A
1.7.8.4	Markings using figures		N/A
1.7.9	Isolation of multiple power sources	Only one power source	N/A
1.7.10	Thermostats and other regulating devices		N/A
1.7.11	Durability		N/A
1.7.12	Removable parts		N/A
1.7.13	Replaceable batteries	No batteries used	N/A
	Language(s)		—
1.7.14	Equipment for restricted access locations	No restricted access location	N/A

2	PROTECTION FROM HAZARDS		P
2.1	Protection from electric shock and energy hazards		P
2.1.1	Protection in operator access areas	Considered in end products	N/A
2.1.1.1	Access to energized parts		N/A
	Test by inspection		N/A
	Test with test finger (Figure 2A)		N/A
	Test with test pin (Figure 2B)		N/A
	Test with test probe (Figure 2C)	No TNV circuit within equipment	N/A
2.1.1.2	Battery compartments		N/A
2.1.1.3	Access to ELV wiring		N/A
	Working voltage (V _{peak} or V _{rms}); minimum distance through insulation (mm)		—
2.1.1.4	Access to hazardous voltage circuit wiring		N/A
2.1.1.5	Energy hazards	(see appended table 2.1.1.5).	P
2.1.1.6	Manual controls		N/A
2.1.1.7	Discharge of capacitors in equipment		P
	Measured voltage (V); time-constant (s).....	No X2 capacitor between L and N	—
2.1.1.8	Energy hazards – d.c. mains supply	Connected to a.c. mains supply only	N/A
	a) Capacitor connected to the d.c. mains supply ..		N/A
	b) Internal battery connected to the d.c. mains supply		N/A
2.1.1.9	Audio amplifiers	No such amplifier	N/A
2.1.2	Protection in service access areas		N/A
2.1.3	Protection in restricted access locations		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
2.2	SELV circuits		P
2.2.1	General requirements	42,4V peak or 60VDC are not exceeded in outputs of power supply under normal operation or single fault condition.	P
2.2.2	Voltages under normal conditions (V)	Output of power supply is not exceeded 42,4V peak or 60VDC.	P
2.2.3	Voltages under fault conditions (V)	Single fault did not cause excessive voltage in accessible outputs. Limits of 71V peak and 120V DC were not exceed and SELV limits not for longer than 0,2 seconds. (see appended table 2.2.2 and 2.2.3).	P
2.2.4	Connection of SELV circuits to other circuits	No direct connection between SELV and any primary circuits.	P

2.3	TNV circuits		N/A
2.3.1	Limits	No TNV circuit within equipment	N/A
	Type of TNV circuits.....		—
2.3.2	Separation from other circuits and from accessible parts		N/A
2.3.2.1	General requirements		N/A
2.3.2.2	Protection by basic insulation		N/A
2.3.2.3	Protection by earthing		N/A
2.3.2.4	Protection by other constructions		N/A
2.3.3	Separation from hazardous voltages		N/A
	Insulation employed		—
2.3.4	Connection of TNV circuits to other circuits		N/A
	Insulation employed		—
2.3.5	Test for operating voltages generated externally		N/A

2.4	Limited current circuits		P
2.4.1	General requirements		P
2.4.2	Limit values	0,7 mA x 15,75=11 mA	P
	Frequency (Hz)	15,75 KHz	—
	Measured current (mA).....	3,5	—
	Measured voltage (V).....	7,0 Vp	—
	Measured circuit capacitance (nF or µF)	2200 pF	—



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Clause	Requirement + Test	Result - Remark	Verdict

2.4.3	Connection of limited current circuits to other circuits		N/A
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2.5	Limited power sources		P
	a) Inherently limited output		N/A
	b) Impedance limited output		N/A
	c) Regulating network limited output under normal operating and single fault condition	(see appended table 2.5)	P
	d) Overcurrent protective device limited output		N/A
	Max. output voltage (V), max. output current (A), max. apparent power (VA)	(see appended table 2.5)	—
	Current rating of overcurrent protective device (A) ..		—
	Use of integrated circuit (IC) current limiters		—

2.6	Provisions for earthing and bonding		N/A
2.6.1	Protective earthing		N/A
2.6.2	Functional earthing		N/A
2.6.3	Protective earthing and protective bonding conductors		N/A
2.6.3.1	General		N/A
2.6.3.2	Size of protective earthing conductors		N/A
	Rated current (A), cross-sectional area (mm ²), AWG		—
2.6.3.3	Size of protective bonding conductors		N/A
	Rated current (A), cross-sectional area (mm ²), AWG	Complies with clause 2.6.3.4	—
	Protective current rating (A), cross-sectional area (mm ²), AWG	Complies with clause 2.6.3.4	N/A
2.6.3.4	Resistance of earthing conductors and their terminations; resistance (Ω), voltage drop (V), test current (A), duration (min).....		N/A
2.6.3.5	Colour of insulation		N/A
2.6.4	Terminals		N/A
2.6.4.1	General		N/A
2.6.4.2	Protective earthing and bonding terminals		N/A
	Rated current (A), type, nominal thread diameter (mm)		—
2.6.4.3	Separation of the protective earthing conductor from protective bonding conductors		N/A
2.6.5	Integrity of protective earthing		N/A
2.6.5.1	Interconnection of equipment		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
2.6.5.2	Components in protective earthing conductors and protective bonding conductors		N/A
2.6.5.3	Disconnection of protective earth		N/A
2.6.5.4	Parts that can be removed by an operator		N/A
2.6.5.5	Parts removed during servicing		N/A
2.6.5.6	Corrosion resistance		N/A
2.6.5.7	Screws for protective bonding		N/A
2.6.5.8	Reliance on telecommunication network or cable distribution system		N/A

2.7	Overcurrent and earth fault protection in primary circuits		P
2.7.1	Basic requirements	Equipment relies on fuse or circuit breaker of the wall outlet installation protection of the building installation in regard to L to N short circuit. Over-current protection is provided by the fuse.	P
	Instructions when protection relies on building installation	Not applicable for pluggable equipment type A.	N/A
2.7.2	Faults not simulated in 5.3.7	The protection device is well dimensioned and mounted.	P
2.7.3	Short-circuit backup protection	Pluggable equipment type A. Building installation is considered as providing short-circuit backup protection.	P
2.7.4	Number and location of protective devices :	Over current protection by one built-in fuse.	P
2.7.5	Protection by several devices	Only one fuse provided.	N/A
2.7.6	Warning to service personnel :	No service work necessary.	N/A

2.8	Safety interlocks		N/A
2.8.1	General principles	No safety interlocks	N/A
2.8.2	Protection requirements		N/A
2.8.3	Inadvertent reactivation		N/A
2.8.4	Fail-safe operation		N/A
	Protection against extreme hazard		N/A
2.8.5	Moving parts		N/A
2.8.6	Overriding		N/A
2.8.7	Switches, relays and their related circuits		N/A
2.8.7.1	Separation distances for contact gaps and their related circuits (mm) :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
2.8.7.2	Overload test		N/A
2.8.7.3	Endurance test		N/A
2.8.7.4	Electric strength test		N/A
2.8.8	Mechanical actuators		N/A

2.9	Electrical insulation		P
2.9.1	Properties of insulating materials	No natural rubber, hygroscopic material and material containing asbestos used as insulation	P
2.9.2	Humidity conditioning		P
	Relative humidity (%), temperature (°C)	93%Rh, 30°C, 48 hrs	—
2.9.3	Grade of insulation	Insulation complies with sub-clauses 2.10, 4.5.1 and 5.2.	P
2.9.4	Separation from hazardous voltages	The secondary circuit is separated from hazardous voltages by reinforced insulation or double insulation	P
	Method(s) used	Method 1 used	—

2.10	Clearances, creepage distances and distances through insulation		P
2.10.1	General	See 2.10.3, 2.10.4 and 2.10.5.	P
2.10.1.1	Frequency	Considered	P
2.10.1.2	Pollution degrees	2	P
2.10.1.3	Reduced values for functional insulation		N/A
2.10.1.4	Intervening unconnected conductive parts		N/A
2.10.1.5	Insulation with varying dimensions		N/A
2.10.1.6	Special separation requirements		N/A
2.10.1.7	Insulation in circuits generating starting pulses		N/A
2.10.2	Determination of working voltage	The rms and the peak voltage were measured on the adapter. The unit was connected to a 240V TN power system and secondary ground was maintained during measurement. Results see appended table 2.10.2.	P
2.10.2.1	General		P
2.10.2.2	RMS working voltage	(see appended table 2.10.2)	P
2.10.2.3	Peak working voltage	(see appended table 2.10.2)	P
2.10.3	Clearances		P
2.10.3.1	General		P
2.10.3.2	Mains transient voltages		P
	a) AC mains supply	2500V	P



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Clause	Requirement + Test	Result - Remark	Verdict
	b) Earthed d.c. mains supplies		N/A
	c) Unearthed d.c. mains supplies		N/A
	d) Battery operation		N/A
2.10.3.3	Clearances in primary circuits	(see appended table 2.10.3 and 2.10.4)	P
2.10.3.4	Clearances in secondary circuits		N/A
2.10.3.5	Clearances in circuits having starting pulses		N/A
2.10.3.6	Transients from a.c. mains supply		N/A
2.10.3.7	Transients from d.c. mains supply		N/A
2.10.3.8	Transients from telecommunication networks and cable distribution systems		N/A
2.10.3.9	Measurement of transient voltage levels		N/A
	a) Transients from a mains supply		N/A
	For an a.c. mains supply		N/A
	For a d.c. mains supply		N/A
	b) Transients from a telecommunication network :		N/A
2.10.4	Creepage distances	(see appended table 2.10.3 and 2.10.4)	P
2.10.4.1	General		P
2.10.4.2	Material group and comparative tracking index		P
	CTI tests.....	Material group IIIb is assumed to be used	—
2.10.4.3	Minimum creepage distances	(see appended table 2.10.3 and 2.10.4)	P
2.10.5	Solid insulation	See below	P
2.10.5.1	General		P
2.10.5.2	Distances through insulation	(see appended table 2.10.5)	P
2.10.5.3	Insulating compound as solid insulation		N/A
2.10.5.4	Semiconductor devices	The opto-coupler used	P
2.10.5.5	Cemented joints		N/A
2.10.5.6	Thin sheet material – General	The polyester tape used in transformer, secondary heatsink	P
2.10.5.7	Separable thin sheet material		P
	Number of layers (pcs).....	2 layers	—
2.10.5.8	Non-separable thin sheet material		N/A
2.10.5.9	Thin sheet material – standard test procedure		N/A
	Electric strength test		—
2.10.5.10	Thin sheet material – alternative test procedure		P
	Electric strength test	3000 V AC applied on 1 layer. (see appended table 5.2)	—



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Clause	Requirement + Test	Result - Remark	Verdict
2.10.5.11	Insulation in wound components		P
2.10.5.12	Wire in wound components		P
	Working voltage		N/A
	a) Basic insulation not under stress		N/A
	b) Basic, supplementary, reinforced insulation		N/A
	c) Compliance with Annex U	The triple insulation wire used in transformer	P
	Two wires in contact inside wound component; angle between 45° and 90°	By insulation tube	P
2.10.5.13	Wire with solvent-based enamel in wound components		N/A
	Electric strength test		—
	Routine test		N/A
2.10.5.14	Additional insulation in wound components		N/A
	Working voltage		N/A
	- Basic insulation not under stress		N/A
	- Supplementary, reinforced insulation		N/A
2.10.6	Construction of printed boards		P
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		N/A
2.10.6.3	Insulation between conductors on the same inner surface of a printed board		N/A
2.10.6.4	Insulation between conductors on different layers of a printed board		N/A
	Distance through insulation		N/A
	Number of insulation layers (pcs)		N/A
2.10.7	Component external terminations		N/A
2.10.8	Tests on coated printed boards and coated components		N/A
2.10.8.1	Sample preparation and preliminary inspection		N/A
2.10.8.2	Thermal conditioning		N/A
2.10.8.3	Electric strength test		N/A
2.10.8.4	Abrasion resistance test		N/A
2.10.9	Thermal cycling		N/A
2.10.10	Test for Pollution Degree 1 environment and insulating compound		N/A
2.10.11	Tests for semiconductor devices and cemented joints		N/A
2.10.12	Enclosed and sealed parts		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
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3	WIRING, CONNECTIONS AND SUPPLY		P
3.1	General		P
3.1.1	Current rating and overcurrent protection	Considered in end products	P
3.1.2	Protection against mechanical damage	Wires do not touch sharp edges which could damage the insulation and cause hazard.	P
3.1.3	Securing of internal wiring	The wires are secured by soldering and glue so that a loosening of the terminal connection is unlikely	P
3.1.4	Insulation of conductors		P
3.1.5	Beads and ceramic insulators	No used	N/A
3.1.6	Screws for electrical contact pressure	No used	N/A
3.1.7	Insulating materials in electrical connections		N/A
3.1.8	Self-tapping and spaced thread screws		N/A
3.1.9	Termination of conductors		P
	10 N pull test	Not loosening	P
3.1.10	Sleeving on wiring		N/A

3.2	Connection to a mains supply		P
3.2.1	Means of connection		P
3.2.1.1	Connection to an a.c. mains supply	Considered in end products	P
3.2.1.2	Connection to a d.c. mains supply		N/A
3.2.2	Multiple supply connections	Single mains supply	N/A
3.2.3	Permanently connected equipment	Not permanently connected equipment	N/A
	Number of conductors, diameter of cable and conduits (mm)		—
3.2.4	Appliance inlets		N/A
3.2.5	Power supply cords		N/A
3.2.5.1	AC power supply cords		N/A
	Type		—
	Rated current (A), cross-sectional area (mm ²), AWG		—
3.2.5.2	DC power supply cords		N/A
3.2.6	Cord anchorages and strain relief		N/A
	Mass of equipment (kg), pull (N)		—
	Longitudinal displacement (mm)		—
3.2.7	Protection against mechanical damage		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
3.2.8	Cord guards		N/A
	Diameter or minor dimension D (mm); test mass (g)		—
	Radius of curvature of cord (mm)		—
3.2.9	Supply wiring space		N/A

3.3	Wiring terminals for connection of external conductors		N/A
3.3.1	Wiring terminals		N/A
3.3.2	Connection of non-detachable power supply cords		N/A
3.3.3	Screw terminals		N/A
3.3.4	Conductor sizes to be connected		N/A
	Rated current (A), cord/cable type, cross-sectional area (mm ²)		—
3.3.5	Wiring terminal sizes		N/A
	Rated current (A), type, nominal thread diameter (mm)		—
3.3.6	Wiring terminal design		N/A
3.3.7	Grouping of wiring terminals		N/A
3.3.8	Stranded wire		N/A

3.4	Disconnection from the mains supply		N/A
3.4.1	General requirement		N/A
3.4.2	Disconnect devices	Considered in end products	N/A
3.4.3	Permanently connected equipment		N/A
3.4.4	Parts which remain energized		N/A
3.4.5	Switches in flexible cords		N/A
3.4.6	Number of poles - single-phase and d.c. equipment	Single – phase equipment	N/A
3.4.7	Number of poles - three-phase equipment		N/A
3.4.8	Switches as disconnect devices		N/A
3.4.9	Plugs as disconnect devices	Considered in end products	N/A
3.4.10	Interconnected equipment		N/A
3.4.11	Multiple power sources		N/A

3.5	Interconnection of equipment		N/A
3.5.1	General requirements		N/A
3.5.2	Types of interconnection circuits		N/A
3.5.3	ELV circuits as interconnection circuits		N/A
3.5.4	Data ports for additional equipment		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
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4	PHYSICAL REQUIREMENTS		N/A
4.1	Stability		N/A
	Angle of 10°		N/A
	Test force (N)		N/A

4.2	Mechanical strength		P
4.2.1	General		P
	Rack-mounted equipment.		N/A
4.2.2	Steady force test, 10 N	Applied to component when measuring creepage distances and clearances	P
4.2.3	Steady force test, 30 N		N/A
4.2.4	Steady force test, 250 N		N/A
4.2.5	Impact test		N/A
	Fall test		N/A
	Swing test		N/A
4.2.6	Drop test; height (mm)		N/A
4.2.7	Stress relief test		N/A
4.2.8	Cathode ray tubes	No such device	N/A
	Picture tube separately certified		N/A
4.2.9	High pressure lamps	No such device	N/A
4.2.10	Wall or ceiling mounted equipment; force (N)		N/A
4.2.11	Rotating solid media	No such device	N/A
	Test to cover on the door.....		N/A

4.3	Design and construction		P
4.3.1	Edges and corners		N/A
4.3.2	Handles and manual controls; force (N)	No such component	N/A
4.3.3	Adjustable controls		N/A
4.3.4	Securing of parts		N/A
4.3.5	Connection by plugs and sockets		N/A
4.3.6	Direct plug-in equipment		N/A
	Torque		—
	Compliance with the relevant mains plug standard		N/A
4.3.7	Heating elements in earthed equipment	No heating element	N/A
4.3.8	Batteries	No battery	N/A
	- Overcharging of a rechargeable battery		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- Unintentional charging of a non-rechargeable battery		N/A
	- Reverse charging of a rechargeable battery		N/A
	- Excessive discharging rate for any battery		N/A
4.3.9	Oil and grease	No insulation exposed to oil and grease	N/A
4.3.10	Dust, powders, liquids and gases	Equipment do not produce dust, not use powder, liquid and gas	N/A
4.3.11	Containers for liquids or gases	No containers for liquids or gases	N/A
4.3.12	Flammable liquids		N/A
	Quantity of liquid (l)		N/A
	Flash point (°C)		N/A
4.3.13	Radiation		N/A
4.3.13.1	General		N/A
4.3.13.2	Ionizing radiation		N/A
	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		N/A
	Part, property, retention after test, flammability classification		N/A
4.3.13.4	Human exposure to ultraviolet (UV) radiation		N/A
4.3.13.5	Lasers (including laser diodes) and LEDs		N/A
4.3.13.5.1	Lasers (including laser diodes)		N/A
	Laser class		—
4.3.13.5.2	Light emitting diodes (LEDs)		N/A
4.3.13.6	Other types		N/A

4.4	Protection against hazardous moving parts		N/A
4.4.1	General	No moving part within equipment	N/A
4.4.2	Protection in operator access areas		N/A
	Household and home/office document/media shredders		N/A
4.4.3	Protection in restricted access locations		N/A
4.4.4	Protection in service access areas		N/A
4.4.5	Protection against moving fan blades		N/A
4.4.5.1	General		N/A
	Not considered to cause pain or injury. a).....		N/A



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Clause	Requirement + Test	Result - Remark	Verdict

	Is considered to cause pain, not injury. b)		N/A
	Considered to cause injury. c)		N/A
4.4.5.2	Protection for users		N/A
	Use of symbol or warning		N/A
4.4.5.3	Protection for service persons		N/A
	Use of symbol or warning		N/A

4.5	Thermal requirements		P
4.5.1	General		P
4.5.2	Temperature tests	(see appended table 4.5)	P
	Normal load condition per Annex L	Maximum normal load which specified by manufacturer	—
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/A

4.6	Openings in enclosures		N/A
4.6.1	Top and side openings	Considered in end products	N/A
	Dimensions (mm)		—
4.6.2	Bottoms of fire enclosures	Considered in end products	N/A
	Construction of the bottom, dimensions (mm) ..		—
4.6.3	Doors or covers in fire enclosures		N/A
4.6.4	Openings in transportable equipment		N/A
4.6.4.1	Constructional design measures		N/A
	Dimensions (mm)		—
4.6.4.2	Evaluation measures for larger openings		N/A
4.6.4.3	Use of metallized parts		N/A
4.6.5	Adhesives for constructional purposes		N/A
	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	(see appended table 4.7)	P
	Method 2, application of all of simulated fault condition tests	(see appended table 5.3)	N/A
4.7.2	Conditions for a fire enclosure	Considered in end products	N/A
4.7.2.1	Parts requiring a fire enclosure	Considered in end products	N/A
4.7.2.2	Parts not requiring a fire enclosure		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

4.7.3	Materials		P
4.7.3.1	General	Parts mounted on PCB of flammability class V-0 or better.	P
4.7.3.2	Materials for fire enclosures	Considered in end products	N/A
4.7.3.3	Materials for components and other parts outside fire enclosures		N/A
4.7.3.4	Materials for components and other parts inside fire enclosures	PCB rated min. V-0, bobbin material rated V-0, approved by UL	P
4.7.3.5	Materials for air filter assemblies	No such devices	N/A
4.7.3.6	Materials used in high-voltage components	No such components	N/A

5	ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS		P
5.1	Touch current and protective conductor current		P
5.1.1	General	See sub-clauses 5.1.2 to 5.1.6.	P
5.1.2	Configuration of equipment under test (EUT)	EUT has only one mains connection.	P
5.1.2.1	Single connection to an a.c. mains supply		P
5.1.2.2	Redundant multiple connections to an a.c. mains supply		N/A
5.1.2.3	Simultaneous multiple connections to an a.c. mains supply		N/A
5.1.3	Test circuit	Equipment of figure 5A used.	P
5.1.4	Application of measuring instrument	Figure 4 of IEC 60990 used	P
5.1.5	Test procedure	Measured between each pole of live parts and output terminal	P
5.1.6	Test measurements		P
	Supply voltage (V)	(see appended table 5.1)	—
	Measured touch current (mA)	(see appended table 5.1)	—
	Max. allowed touch current (mA)	(see appended table 5.1)	—
	Measured protective conductor current (mA)		—
	Max. allowed protective conductor current (mA) ..		—
5.1.7	Equipment with touch current exceeding 3,5 mA		N/A
5.1.7.1	General		N/A
5.1.7.2	Simultaneous multiple connections to the supply		N/A
5.1.8	Touch currents to telecommunication networks and cable distribution systems and from telecommunication networks	No telecommunication network connection ports on equipment	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.1.8.1	Limitation of the touch current to a telecommunication network or to a cable distribution system		N/A
	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
	a) EUT with earthed telecommunication ports		N/A
	b) EUT whose telecommunication ports have no reference to protective earth		N/A

5.2	Electric strength		P
5.2.1	General	(see appended table 5.2)	P
5.2.2	Test procedure		P

5.3	Abnormal operating and fault conditions		P
5.3.1	Protection against overload and abnormal operation	(see appended table 5.3)	P
5.3.2	Motors	No motors	P
5.3.3	Transformers	With the shorted output of the transformer, no high temperature of the transformer was recorded. Results of the short-circuit tests see appended table 5.3 and Annex C.	P
5.3.4	Functional insulation	Method c). Test results see appended table 5.3.	P
5.3.5	Electromechanical components	No electromechanical component provided.	N/A
5.3.6	Audio amplifiers in ITE	No such component.	N/A
5.3.7	Simulation of faults	Results see appended table.	P
5.3.8	Unattended equipment	None of the listed components was provided.	N/A
5.3.9	Compliance criteria for abnormal operating and fault conditions	No fire propagated beyond the equipment. No molten metal was emitted. Electric strength test primary to SELV was passed.	P
5.3.9.1	During the tests	During the test, no fire propagated beyond equipment; not emit molten metal and enclosure did not deform	P



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Clause	Requirement + Test	Result - Remark	Verdict

5.3.9.2	After the tests	After the test, no any insulation damaged and withstand dielectric strength test AC3000V between live parts and secondary circuit	P
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6	CONNECTION TO TELECOMMUNICATION NETWORKS		N/A
6.1	Protection of telecommunication network service persons, and users of other equipment connected to the network, from hazards in the equipment		N/A
6.1.1	Protection from hazardous voltages		N/A
6.1.2	Separation of the telecommunication network from earth		N/A
6.1.2.1	Requirements	No TNV.	N/A
	Supply voltage (V)		—
	Current in the test circuit (mA)		—
6.1.2.2	Exclusions		N/A

6.2	Protection of equipment users from overvoltages on telecommunication networks		N/A
6.2.1	Separation requirements	No TNV.	N/A
6.2.2	Electric strength test procedure		N/A
6.2.2.1	Impulse test		N/A
6.2.2.2	Steady-state test		N/A
6.2.2.3	Compliance criteria		N/A

6.3	Protection of the telecommunication wiring system from overheating		N/A
	Max. output current (A)	No TNV.	—
	Current limiting method		—

7	CONNECTION TO CABLE DISTRIBUTION SYSTEMS		N/A
7.1	General		N/A
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/A
7.3	Protection of equipment users from overvoltages on the cable distribution system		N/A
7.4	Insulation between primary circuits and cable distribution systems		N/A
7.4.1	General		N/A
7.4.2	Voltage surge test		N/A
7.4.3	Impulse test		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
A	ANNEX A, TESTS FOR RESISTANCE TO HEAT AND FIRE		N/A
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
A.1.1	Samples		—
	Wall thickness (mm)		—
A.1.2	Conditioning of samples; temperature (°C)		N/A
A.1.3	Mounting of samples		N/A
A.1.4	Test flame (see IEC 60695-11-3)		N/A
	Flame A, B, C or D		—
A.1.5	Test procedure		N/A
A.1.6	Compliance criteria		N/A
	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
A.2.1	Samples, material		—
	Wall thickness (mm)		—
A.2.2	Conditioning of samples; temperature (°C)		N/A
A.2.3	Mounting of samples		N/A
A.2.4	Test flame (see IEC 60695-11-4)		N/A
	Flame A, B or C		—
A.2.5	Test procedure		N/A
A.2.6	Compliance criteria		N/A
	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/A
	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
A.3.1	Mounting of samples		N/A
A.3.2	Test procedure		N/A
A.3.3	Compliance criterion		N/A



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Clause	Requirement + Test	Result - Remark	Verdict

B	ANNEX B, MOTOR TESTS UNDER ABNORMAL CONDITIONS (see 4.7.2.2 and 5.3.2)		N/A
B.1	General requirements		N/A
	Position		—
	Manufacturer		—
	Type		—
	Rated values		—
B.2	Test conditions		N/A
B.3	Maximum temperatures		N/A
B.4	Running overload test		N/A
B.5	Locked-rotor overload test		N/A
	Test duration (days)		—
	Electric strength test: test voltage (V)		—
B.6	Running overload test for d.c. motors in secondary circuits		N/A
B.6.1	General		N/A
B.6.2	Test procedure		N/A
B.6.3	Alternative test procedure		N/A
B.6.4	Electric strength test; test voltage (V)		N/A
B.7	Locked-rotor overload test for d.c. motors in secondary circuits		N/A
B.7.1	General		N/A
B.7.2	Test procedure		N/A
B.7.3	Alternative test procedure		N/A
B.7.4	Electric strength test; test voltage (V)		N/A
B.8	Test for motors with capacitors		N/A
B.9	Test for three-phase motors		N/A
B.10	Test for series motors		N/A
	Operating voltage (V)		—

C	ANNEX C, TRANSFORMERS (see 1.5.4 and 5.3.3)		P
	Position	(See appended tabel 1.5.1)	—
	Manufacturer	(See appended tabel 1.5.1)	—
	Type	(See appended tabel 1.5.1)	—
	Rated values	(See appended tabel 1.5.1)	—
	Method of protection	(See appended tabel 1.5.1)	—
C.1	Overload test	(see appended table 5.3)	P
C.2	Insulation	(see appended tables 5.2 and C2)	P



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Clause	Requirement + Test	Result - Remark	Verdict
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	Protection from displacement of windings :	By insulation tape	P
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D	ANNEX D, MEASURING INSTRUMENTS FOR TOUCH-CURRENT TESTS (see 5.1.4)		P
D.1	Measuring instrument		P
D.2	Alternative measuring instrument		N/A

E	ANNEX E, TEMPERATURE RISE OF A WINDING (see 1.4.13)		P
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F	ANNEX F, MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES (see 2.10 and Annex G)		P
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G	ANNEX G, ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES		N/A
G.1	Clearances		N/A
G.1.1	General		N/A
G.1.2	Summary of the procedure for determining minimum clearances		N/A
G.2	Determination of mains transient voltage (V)		N/A
G.2.1	AC mains supply :		N/A
G.2.2	Earthed d.c. mains supplies :		N/A
G.2.3	Unearthed d.c. mains supplies :		N/A
G.2.4	Battery operation :		N/A
G.3	Determination of telecommunication network transient voltage (V) :		N/A
G.4	Determination of required withstand voltage (V)		N/A
G.4.1	Mains transients and internal repetitive peaks :		N/A
G.4.2	Transients from telecommunication networks :		N/A
G.4.3	Combination of transients		N/A
G.4.4	Transients from cable distribution systems		N/A
G.5	Measurement of transient voltages (V)		N/A
	a) Transients from a mains supply		N/A
	For an a.c. mains supply		N/A
	For a d.c. mains supply		N/A
	b) Transients from a telecommunication network		N/A
G.6	Determination of minimum clearances :		N/A

H	ANNEX H, IONIZING RADIATION (see 4.3.13)		N/A
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J	ANNEX J, TABLE OF ELECTROCHEMICAL POTENTIALS (see 2.6.5.6)		N/A
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Clause	Requirement + Test	Result - Remark	Verdict

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

L	ANNEX L, NORMAL LOAD CONDITIONS FOR SOME TYPES OF ELECTRICAL BUSINESS EQUIPMENT (see 1.2.2.1 and 4.5.2)		P
L.1	Typewriters		N/A
L.2	Adding machines and cash registers		N/A
L.3	Erasers		N/A
L.4	Pencil sharpeners		N/A
L.5	Duplicators and copy machines		N/A
L.6	Motor-operated files		N/A
L.7	Other business equipment		P

M	ANNEX M, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1)		N/A
M.1	Introduction		N/A
M.2	Method A		N/A
M.3	Method B		N/A
M.3.1	Ringling signal		N/A
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/A
M.3.2.1	Conditions for use of a tripping device or a monitoring voltage		N/A
M.3.2.2	Tripping device		N/A
M.3.2.3	Monitoring voltage (V)		N/A

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/A
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Clause	Requirement + Test	Result - Remark	Verdict
N.1	ITU-T impulse test generators		N/A
N.2	IEC 60065 impulse test generator		N/A
P	ANNEX P, NORMATIVE REFERENCES		—
Q	ANNEX Q, Voltage dependent resistors (VDRs) (see 1.5.9.1)		N/A
	a) Preferred climatic categories		N/A
	b) Maximum continuous voltage		N/A
	c) Pulse current		N/A
R	ANNEX R, EXAMPLES OF REQUIREMENTS FOR QUALITY CONTROL PROGRAMMES		N/A
R.1	Minimum separation distances for unpopulated coated printed boards (see 2.10.6.2)		N/A
R.2	Reduced clearances (see 2.10.3)		N/A
S	ANNEX S, PROCEDURE FOR IMPULSE TESTING (see 6.2.2.3)		N/A
S.1	Test equipment		N/A
S.2	Test procedure		N/A
S.3	Examples of waveforms during impulse testing		N/A
T	ANNEX T, GUIDANCE ON PROTECTION AGAINST INGRESS OF WATER (see 1.1.2)		N/A
			—
U	ANNEX U, INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION (see 2.10.5.4)		P
		Approved TIW used	—
V	ANNEX V, AC POWER DISTRIBUTION SYSTEMS (see 1.6.1)		P
V.1	Introduction		P
V.2	TN power distribution systems		P
W	ANNEX W, SUMMATION OF TOUCH CURRENTS		N/A
W.1	Touch current from electronic circuits		N/A
W.1.1	Floating circuits		N/A
W.1.2	Earthed circuits		N/A
W.2	Interconnection of several equipments		N/A
W.2.1	Isolation		N/A
W.2.2	Common return, isolated from earth		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
W.2.3	Common return, connected to protective earth		N/A
X	ANNEX X, MAXIMUM HEATING EFFECT IN TRANSFORMER TESTS (see clause C.1)		N/A
X.1	Determination of maximum input current		N/A
X.2	Overload test procedure		N/A
Y	ANNEX Y, ULTRAVIOLET LIGHT CONDITIONING TEST (see 4.3.13.3)		N/A
Y.1	Test apparatus		N/A
Y.2	Mounting of test samples		N/A
Y.3	Carbon-arc light-exposure apparatus		N/A
Y.4	Xenon-arc light exposure apparatus		N/A
Z	ANNEX Z, OVERVOLTAGE CATEGORIES (see 2.10.3.2 and Clause G.2)		P
AA	ANNEX AA, MANDREL TEST (see 2.10.5.8)		N/A
BB	ANNEX BB, CHANGES IN THE SECOND EDITION		—
CC	ANNEX CC, Evaluation of integrated circuit (IC) current limiters		N/A
CC.1	General		N/A
CC.2	Test program 1.....		N/A
CC.3	Test program 2.....		N/A
DD	ANNEX DD, Requirements for the mounting means of rack-mounted equipment		N/A
DD.1	General		N/A
DD.2	Mechanical strength test, variable N.....		N/A
DD.3	Mechanical strength test, 250N, including end stops.....		N/A
DD.4	Compliance.....		N/A
EE	ANNEX EE, Household and home/office document/media shredders		N/A
EE.1	General		N/A
EE.2	Markings and instructions		N/A
	Use of markings or symbols.....		N/A
	Information of user instructions, maintenance and/or servicing instructions.....		N/A
EE.3	Inadvertent reactivation test.....		N/A



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

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Clause	Requirement + Test	Result - Remark	Verdict

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⁾
Internal wire	Suntops Electronics Co Ltd	1007, 1015	VW-1, min. 22AWG, 300V, 80°C	UL	UL E306191
(Alternative)	Various	1007, 1015	VW-1, min. 22AWG, 300V, 80°C	UL	UL
Fuse	XC Electronics	3T Serie(s)	T1AL, 250Vac	EN60127-1 EN60127-3	VDE 40019614
(Alternative)	Littelfuse Inc.	677 Series	T1AL, 250Vac	EN60127-1 EN60127-3	VDE 40006258
Y capacitor (Y1)	Dongguan Easy-gather	DCF	AC 400V, Max. 2200pF, 25/125/21/C	IEC 60384- 14(ed.3)	VDE 40022942
(Alternative)	Jya-Nay Co., Ltd.	JN	AC 250V, Max. 2200pF, 25/125/21/C	IEC 60384- 14(ed.3)	VDE 40001831
PCB	Guangzhou City Henyida	H-068	94V-0, 130°C, min. thickness: 1,6mm	UL	UL E258570
(Alternative)	Various	Various	94V-0, 130°C, min. thickness: 1,6mm	UL	UL
Bridge Rectifier (D1-D4)	Various	Various	Min. 1A, min. 700V	--	Tested with appliance
E-Capacitor (C1, C2)	Various	Various	4,7-22µF, min. 400V, 105°C	--	Tested with appliance
Transistor (Q1)	Various	Various	Min. 2A, min. 600V	--	Tested with appliance
Heat shrinkable tube	Various	Various	125°C, VW-1, 300V	UL	UL
Main transformer(T1) (for UC-2A)	Gembird	EF20- 20150520/GS	Class B N1: Φ0,23mm x1x 45Ts; N2: Φ0,35mm x 3 x 6Ts; N3: Φ0,23mm x1x 45Ts; N4: Φ0,15mm x 2 x 15Ts	--	Tested with appliance
(For UC-1A)	Gembird	EE16-5V1A-2	Class B N1: Φ0,15mmx1x 124Ts; N2: Φ0,45mm x1x 12Ts; N3: Φ0,20mm x1x 31Ts; E1:0,05mmx7mmx0,9Ts; E2: 0,05mmx7mmx0,9Ts	--	Tested with appliance
- Bobbin	CHANG CHUN	T375J, T373J	PF, 94V-0, 150°C, 0,75mm	UL	UL E59481
(Alternative)	Hitachi	CP-J-8800	PF, 94V-0, 150°C, 0,87mm	UL	UL E42956
(Alternative)	Sumitomo	PM-9630, PM-9820	PF, 94V-0, 150°C, 0,51mm	UL	UL E41429



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Clause	Requirement + Test			Result - Remark	Verdict
- Tripe insulated wire	Furukawa	TEX-E	Max, 1000Vpeak, 600 Vrms, Class B	IEC 60950-1 IEC 60065	VDE 006735
(Alternative)	Totoku	TIW-2	Max, 1000Vpeak, 600 Vrms, Class B	IEC 60950-1 IEC 60065	VDE 40005152
- Magnet wire	Pacific	DD-NYU	130°C	UL	UL E84081
(Alternative)	Guangzhou Golden Shing	xUEW	130°C	UL	UL E232170
(Alternative)	Hung Cheng	UEW	130°C	UL	UL E223922
- Insulation tape	3M	1350F-1(b)	130°C	UL	UL E17385
(Alternative)	Various	Various	130°C	UL	UL
- Tube	Zeus Industrial Products Inc	TFE-TW-300, TFE-SW-600, TFE-HW-600	200°C, VW-1	UL	UL E64007
(Alternative)	Great Holding Industrial Co., Ltd.	TFL, TFS, TFT	200°C, VW-1	UL	UL E156256
(Alternative)	Various	Various	200°C, VW-1	UL	UL
- Varish	Hitachi	WA-238A, WF-285	130°C	UL	UL E72978
(Alternative)	Hang Cheung Petrochemical Ltd.	8562(a)	130°C	UL	UL E200154
15. Optocoupler (IC2, U2)	Everlight	EL817 V	AC 250V, Dti = 0,5mm; Int./Ext. Cr.: 6,0/7,7 mm	IEC 60950-1	VDE132249 UL E214129
(Alternative)	Sharp	PC817	AC250V, Dti = 0,45mm; Int./Ext. Cr.: 6,5/8,0 mm	IEC 60950-1	VDE (40008087)
(Alternative)	Bright Led	BPC 817	AC 250V, Dti = 0,4mm; Int./Ext. Cr.: 5,0/7,8 mm	IEC 60950-1	VDE (40007240)
Supplementary information:					
1) Provided evidence ensures the agreed level of compliance. See OD-CB2039.					

1.5.1	TABLE: Opto Electronic Devices	P
Manufacturer.....: Everlight Electronics Co., Ltd.		
Type.....: EL817 V		
Separately tested.....: N/A (approved component)		
Bridging insulation.....: Reinforced insulation		
External creepage distance: 7,7mm		
Internal creepage distance: 6,0mm		
Distance through insulation: 0,5mm		
Tested under the following conditions: N/A		
Input.....: --		
Output.....: --		



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Clause	Requirement + Test	Result - Remark	Verdict

supplementary information

1.5.1	TABLE: Opto Electronic Devices	P
Manufacturer.....: Sharp Corp Electronic Components Group		
Type.....: PC817		
Separately tested.....: N/A (approved component)		
Bridging insulation.....: Reinforced insulation		
External creepage distance.....: 8,2mm		
Internal creepage distance.....: 4,0mm		
Distance through insulation.....: 0,45mm		
Tested under the following conditions.....: N/A		
Input.....: --		
Output.....: --		
supplementary information		

1.5.1	TABLE: Opto Electronic Devices	P
Manufacturer.....: Bright Led		
Type.....: BPC 817		
Separately tested.....: N/A (approved component)		
Bridging insulation.....: Reinforced insulation		
External creepage distance.....: 7,8mm		
Internal creepage distance.....: 5,0mm		
Distance through insulation.....: 0,4mm		
Tested under the following conditions.....: N/A		
Input.....: --		
Output.....: --		
supplementary information		

1.6.2	TABLE: Electrical data (in normal conditions)						P
U (V)	I (mA)	Irated (mA)	P (W)	Fuse #	Ifuse (mA)	Condition/status	
For model: UC-1A							
225V/50Hz	72,2	--	7,20	F1	72,2	At rated output load: 5Vd.c./1A	
250V/50Hz	67,5	180	7,24	F1	67,5	At rated output load: 5Vd.c./1A	
275V/50Hz	64,2	--	7,26	F1	64,2	At rated output load: 5Vd.c./1A	
For model: UC-2A							
225V/50Hz	128	--	13,03	F1	128	At rated output load: 5Vd.c./2A	

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Clause	Requirement + Test				Result - Remark	Verdict
250V/50Hz	116	180	13,13	F1	116	At rated output load: 5Vd.c./2A
275V/50Hz	109	--	13,29	F1	109	At rated output load: 5Vd.c./2A
Supplementary information:						

2.1.1.5 c) 1)	TABLE: max. V, A, VA test				P
Voltage (rated) (V)	Current (rated) (A)	Voltage (max.) (V)	Current (max.) (A)	VA (max.) (VA)	
5,0V d.c.	1,0A	5,21	3,30	8,50(UC-1A)	
5,0V d.c.	2,0A	5,14	2,32	11,57(UC-2A)	
supplementary information:					

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

2.2	TABLE: evaluation of voltage limiting components in SELV circuits			P
Component (measured between)	max. voltage (V) (normal operation)		Voltage Limiting Components	
	V peak	V d.c.		
For model: UC-1A				
T1 pin5-pin6	31,6	--	--	
For model: UC-2A				
T1 pin9-pin10	26,6	---	--	
Fault test performed on voltage limiting components	Voltage measured (V) in SELV circuits (V peak or V d.c.)			
supplementary information:				

2.5	TABLE: limited power sources		P
Circuit output tested: 5,0V output (model: UC-1A)			
Measured Uoc (V) with all load circuits disconnected:	5,21V		
	I _{sc} (A)	VA	

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Clause	Requirement + Test	Result - Remark		Verdict	
		Meas.	Limit	Meas.	Limit
1.	under max. load condition	3,30	8	8,50	100
2.	IC2 pin1-2 short	0	8	0	100
3.	IC2 pin3-4 short	0	8	0	100
supplementary information:					
SC=Short circuit, OC=Open circuit					

2.5	TABLE: limited power sources				P
Circuit output tested: 5,0V output (model: UC-2A)					
Measured Uoc (V) with all load circuits disconnected:		5,14V			
		I _{sc} (A)		VA	
		Meas.	Limit	Meas.	Limit
1.	under max. load condition	2,32	8	11,57	100
2.	U2 pin1-2 short	0	8	0	100
3.	U2 pin3-4 short	0	8	0	100
4.	R9 short	0	8	0	100
supplementary information:					
SC=Short circuit, OC=Open circuit					

2.10.2	Table: working voltage measurement			P
Location	RMS voltage (V)	Peak voltage (V)	Comments	
Model: UC-1A				
T1 pin 1-5	196	395		
T1 pin 1-6	189	366		
T1 pin 2-5	230	515		
T1 pin 2-6	232	520	Max. Vrms and Max. Vpeak	
T1 pin 3-5	194	430		
T1 pin 3-6	194	455		
T1 pin 4-5	191	368		
T1 pin 4-6	188	362		
CY1 two pins	189	362		
IC2 pin1-3	188	362		
IC2 pin1-4	174	340		
IC2 pin2-3	188	362		
IC2 pin2-4	174	340		

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Clause	Requirement + Test	Result - Remark	Verdict

Model: UC-2A			
T1 pin 1-9	186	352	
T1 pin 2-9	182	348	
T1 pin 3-9	232	515	Max. Vrms and Max. Vpeak
T1 pin 5-9	183	410	
T1 pin 1-10	178	370	
T1 pin 2-10	178	350	
T1 pin 3-10	221	515	
T1 pin 5-10	181	380	
U2 pin1-3	182	350	
U2 pin1-4	180	348	
U2 pin2-3	181	350	
U2 pin2-4	180	348	
CY1 two pins	176	344	
supplementary information:			
Tested under 250Va.c., 50Hz			

2.10.3 and 2.10.4	TABLE: clearance and creepage distance measurements						P
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)	
For model: UC-1A							
L and N before fuse F1 (FI)	<420	240	1,5	2,8	2,5	2,8	
Terminals of fuse F1 (BI)	<420	240	2,0	2,6	2,5	2,6	
L and circuit after fuse (FI)	<420	240	1,5	3,9	2,5	3,9	
Terminals of Y1 (RI)	<420	240	4,0	8,1	5,0	8,1	
T1 pri. pins and sec. trace on PCB (RI)	520	232	4,4	8,8	5,0	8,8	
Pri. winding and sec. pins of T1 (RI)	520	232	4,4	6,7	5,0	6,7	
Iron core and sec. pins of T1 (RI)	520	232	4,4	5,7	5,0	5,7	
IC2 pri. pins and sec. pins (RI)	<420	240	4,0	6,4	5,0	6,4	
For model: UC-2A							
L and N before fuse F1 (FI)	<420	240	1,5	2,9	2,5	3,6	
Terminals of fuse F1 (BI)	<420	240	2,0	3,0	2,5	3,0	
L and circuit after fuse (FI)	<420	240	1,5	3,0	2,5	3,0	
Terminals of Y1 (RI)	<420	240	4,0	6,5	5,0	6,5	
Pri. winding and sec. pins of T1 (RI)	515	232	4,4	6,3	5,0	6,3	

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Clause	Requirement + Test			Result - Remark		Verdict
Iron core and sec. pins of T1 (RI)	515	232	4,4	5,3	5,0	5,3
T1 pri. pins and sec. trace on PCB (RI)	515	232	4,4	7,5	5,0	7,5
U2 pri. pins and sec. pins (RI)	<420	240	4,0	7,3	5,0	7,3
Remark:						
1. The iron core of transformer T1 is considered as primary live parts.						
2. FI: Functional insulation; BI: Basic insulation; RI: Reinforced insulation.						

2.10.5	TABLE: Distance through insulation measurements					P
Distance through insulation (DTI) at/of:	U peak (V)	U rms (V)	Test voltage (V)	Required DTI (mm)	DTI (mm)	
Optocoupler IC1, U2(RI)	<420	240	AC 3000	≥0,4	1)	
Supplementary information:						
1) see appended table 1.5.1.						
R.I.: Reinforced insulation.						

4.3.8	TABLE: Batteries								N/A
The tests of 4.3.8 are applicable only when appropriate battery data is not available									
Is it possible to install the battery in a reverse polarity position?									
	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:									
- 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:									
								Verdict	



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Clause	Requirement + Test	Result - Remark	Verdict

4.3.8	TABLE: Batteries		N/A
Battery category :		(Lithium, NiMh, NiCad, Lithium Ion ...)	
Manufacturer.....:			
Type / model.....:			
Voltage.....:			
Capacity.....:		mAh	
Tested and Certified by (incl. Ref. No.).....:			
Circuit protection diagram:			

MARKINGS AND INSTRUCTIONS (1.7.12, 1.7.15)	
Location of replaceable battery	
Language(s)	
Close to the battery	
In the servicing instructions	
In the operating instructions	

4.5	TABLE: Thermal requirements		P
	test voltage (V)	A: 225V/50Hz; B: 275V/50Hz	
	Tamb1 (°C)	45,0	45,0
	Tamb2 (°C)	45,0	45,0
Maximum measured temperature T of part/at:		Measured T (°C)	
		A	B
Test condition: UC-1A			--
Internal wire		67,9	70,3
IC2 surface		80,0	82,5
L2 surface		78,4	80,6
C2 surface		76,4	78,8
T1 core		94,3	97,3
T1 coil		95,2	98,2
CY1 surface		94,5	97,3
C7 surface		87,1	88,9
PWB under IC1		89,7	95,2
PWB under T1		86,9	88,9
PWB under D6		106,0	107,4
Enclosure internal surface near T1		83,4	74,6
Enclosure external surface		83,0	74,7
Output wire		66,4	67,3

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Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:							
Temperature T of winding:	t ₁ (°C)	R ₁ (Ω)	t ₂ (°C)	R ₂ (Ω)	T (°C)	Allowed T _{max} (°C)	Insulation class
Winding of transformer	--	--	--	--	--	--	--
Supplementary information:							
1. Thermocouple method used.							
2. Tma is 45°C Max., all the tests were performed in ambient and the above data were adjusted according to ambient temperature 45°C.							

4.5	TABLE: Thermal requirements			P			
	test voltage (V)	A: 225V/50Hz; B: 275V/50Hz		—			
	Tamb1 (°C)	45,0	45,0	—			
	Tamb2 (°C)	45,0	45,0	—			
Maximum measured temperature T of part/at:		Measured T (°C)		Allowed Tmax (°C)			
Test condition: UC-2A		A	B	--			
Internal wire		57,9	59,0	80			
U2 surface		77,3	78,9	Ref.			
L1 surface		73,1	73,9	130			
C2 surface		78,4	81,8	105			
T1 core		94,9	97,0	Ref.			
T1 coil		95,2	97,5	110			
Y1 surface		93,4	95,4	125			
C9 surface		100,1	101,5	105			
L2 surface		85,4	86,8	130			
PWB under T1		83,1	86,2	130			
PWB under D8		100,3	101,8	130			
Enclosure internal surface near T1		61,1	62,7	Cl.4.2.7			
Enclosure external surface		58,1	59,6	95			
Output wire		66,4	67,3	80			
Supplementary information:							
Temperature T of winding:	t ₁ (°C)	R ₁ (Ω)	t ₂ (°C)	R ₂ (Ω)	T (°C)	Allowed T _{max} (°C)	Insulation class
Winding of transformer	--	--	--	--	--	--	--
Supplementary information:							
1. Thermocouple method used.							
2. Tma is 45°C Max., all the tests were performed in ambient and the above data were adjusted according to ambient temperature 45°C.							



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Clause	Requirement + Test	Result - Remark	Verdict
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4.5.5	TABLE: ball pressure test of thermoplastic parts		N/A
	allowed impression diameter (mm)	≤ 2 mm	—
part	test temperature (°C)	impression diameter (mm)	
Supplementary information: the bobbin material for T1 is phenolic, accepted without test.			

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

5.1	TABLE: touch current measurement				P
Measured between:	Measured (mA)	Limit (mA)	Comments/conditions		
Between live parts and output terminal	0,20	0,25	275Va.c./60Hz, Figure 5A used		
supplementary information:					

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		
L/N pole and output terminals (RI)	DC 4242	No	No		
Primary winding and secondary winding of T1 (RI)	AC 3000	No	No		
Secondary winding and core of T1 (RI)	AC 3000	No	No		
Each layer insulating tape (RI)	AC 3000	No	No		
Supplementary information: core is considered as primary circuit.					

5.3	TABLE: Fault condition tests						P
	Ambient temperature (°C)	45, if no specified				—	
	Power source for EUT: Manufacturer, model/type, output rating	--				—	
Component No.	Fault	Supply voltage (V)	Test time	Fuse #	Fuse current (A)	Observation	
For model: UC-1A							
1.	D1	S-C	275	1s	F1	--	F1 opened immediately, no hazards.

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Clause	Requirement + Test					Result - Remark	Verdict
2.	C1	S-C	275	1s	F1	--	F1 opened immediately, no hazards.
3.	D5	S-C	275	10 min	F1	0,12→0,05	Unit shut down immediately, no hazards, no hazards.
4.	D6	S-C	275	10 min	F1	0,12→0,007	Unit shut down immediately, no hazards, no hazards.
5.	T1 pin5 – 6	S-C	275	10 min	F1	0,12→0,007	Unit shut down immediately, no hazards, no hazards.
6.	T1 Pin1 – 2	S-C	275	10 min	F1	0,12→0,007	Unit shut down immediately, no hazards, no hazards.
7.	T1 pin3 – 4	S-C	275	10 min	F1	0,12→0,007	Unit shut down immediately, no hazards, no hazards.
8.	IC1 pin1 - 5	S-C	275	1s	F1	--	L2 damaged, no hazards. Repeated 3 times and got the same result.
9.	IC1 pin5 - 4	S-C	275	1s	F1	--	L2 damaged, no hazards. Repeated 3 times and got the same result.
10.	IC2 pin1 - 2	S-C	275	10 min	F1	0,12→0,007	Unit shut down immediately, no hazards, no hazards.
11.	IC2 pin3 - 4	S-C	275	10 min	F1	0,12→0,007	Unit shut down immediately, no hazards, no hazards.
12.	IC2 pin1	S-C	275	10 min	F1	0,12→0,009	Unit shut down immediately, no hazards, no hazards.
13.	IC2 pin3	S-C	275	10 min	F1	0,12→0,009	Unit shut down immediately, no hazards, no hazards.
14.	Output	S-C	275	10 min	F1	0,12→0,007	Unit shut down immediately, no hazards, no hazards.
15.	Output	O-L	275	4,6 hrs	F1	0,064→0,073→0,079→0,085→0,081→0,075	Temperature was stable at 1,5A, increase to 1,6A, unit shut down immediately, Maximum temperature was: T1 winding: 128,9°C; T1 core: 125,4°C; Ambient: 45,0°C no damage, no hazards
For model: UC-2A							
1	D1	S-C	275	1s	F1	--	F1 opened immediately, no hazards.
2	C1	S-C	275	1s	F1	--	F1 opened immediately, no hazards.
3	Q1 G-S	S-C	275	10 min	F1	0,18→0,002	Unit shut down immediately, no hazards, no hazards.

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Clause	Requirement + Test					Result - Remark	Verdict
4	Q1 D-G	S-C	275	1s	F1	--	F1 opened immediately, Q1, R8 and R9 damaged no hazards.
5	Q1 D-S	S-C	275	1s	F1	--	F1 opened immediately, Q1, R8 and R9 damaged no hazards.
6	T1 pin1 – 3	S-C	275	10 min	F1	0,18→ 0,002	Unit shut down immediately, no hazards, no hazards.
7	T1 Pin2 – 5	S-C	275	10 min	F1	0,18→ 0,06	Unit shut down immediately, no hazards, no hazards.
8	T1 pin9 – 10	S-C	275	1s	F1	--	F1 opened immediately, Q1, R8 and R9 damaged no hazards.
9	U2 pin1 - 2	S-C	275	10 min	F1	0,18→ 0,002	Unit shut down immediately, no hazards, no hazards.
10	U2 pin3 - 4	S-C	275	10 min	F1	0,18→ 0,002	Unit shut down immediately, no hazards, no hazards.
11	U1 pin2 - 5	S-C	275	10 min	F1	0,18→ 0,002	Unit shut down immediately, no hazards, no hazards.
12	D8	S-C	275	10 min	F1	0,18→ 0,002	Unit shut down immediately, no hazards, no hazards.
13	Output	S-C	275	10 min	F1	0,18→ 0,002	Unit shut down immediately, no hazards, no hazards.
19	Output	O-L	275	5,5 hrs	F1	0,113→ 0,118→ 0,131→ 0,002	Temperature was stable at 2,47A, increase to 2,5A, unit shut down immediately, Maximum temperature was: T1 winding: 107,9°C; T1 core: 107,3°C; Ambient: 45,0°C no damage, no hazards.

Supplementary information:

1. "S-C" means short-circuited test, "O/L" means overload test, "O-C" means open-circuited test; U_o means output voltage at normal load, U_{oc} means output voltage without load. (unit: V d.c.)
2. Thermocouple method used.
3. The fault condition tests were repeated with all alternative current fuse and got the same results when fuse open in the fault condition tests.
4. Limited temperature for winding is 165°C (Class B). The above temperature data were adjusted according to ambient temperature 40°C.

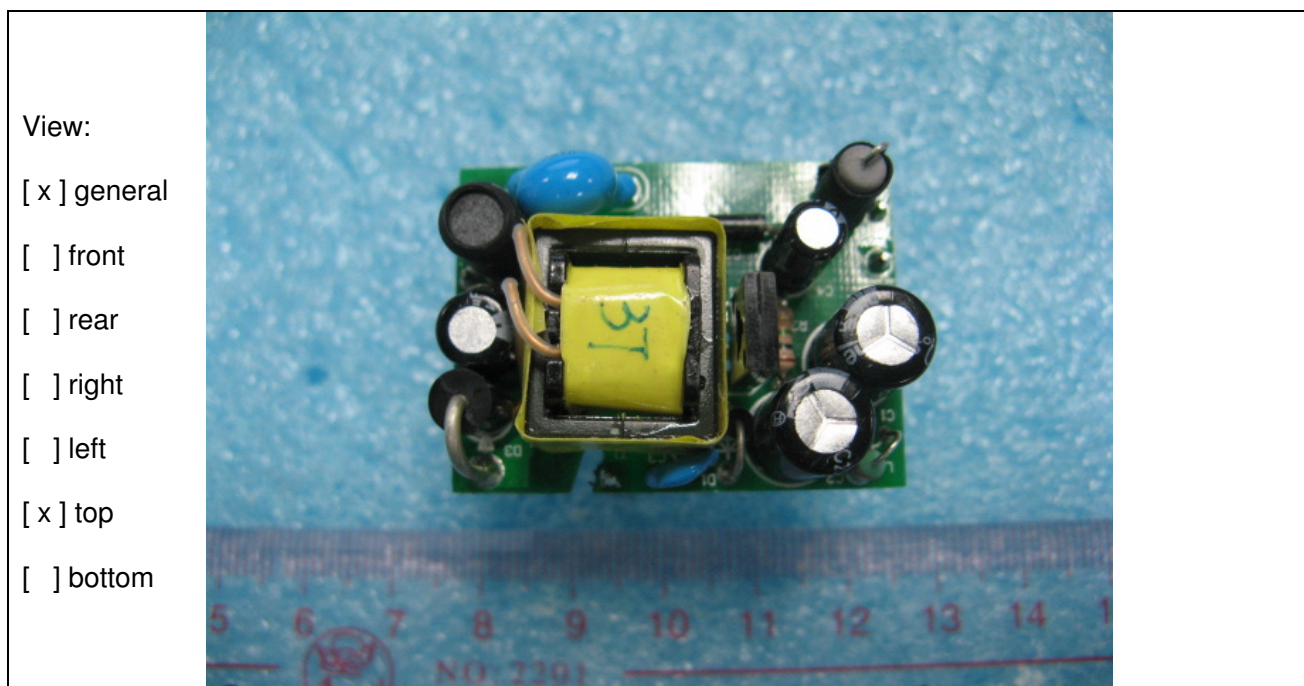
C.2	TABLE: transformers							P
Loc.	Tested insulation	Working voltage peak / V (2.10.2)	Working voltage rms / V (2.10.2)	Required electric strength (5.2)	Required clearance / mm (2.10.3)	Required creepage distance / mm (2.10.4)	Required distance thr. insul. (2.10.5)	
For model: UC-1A								



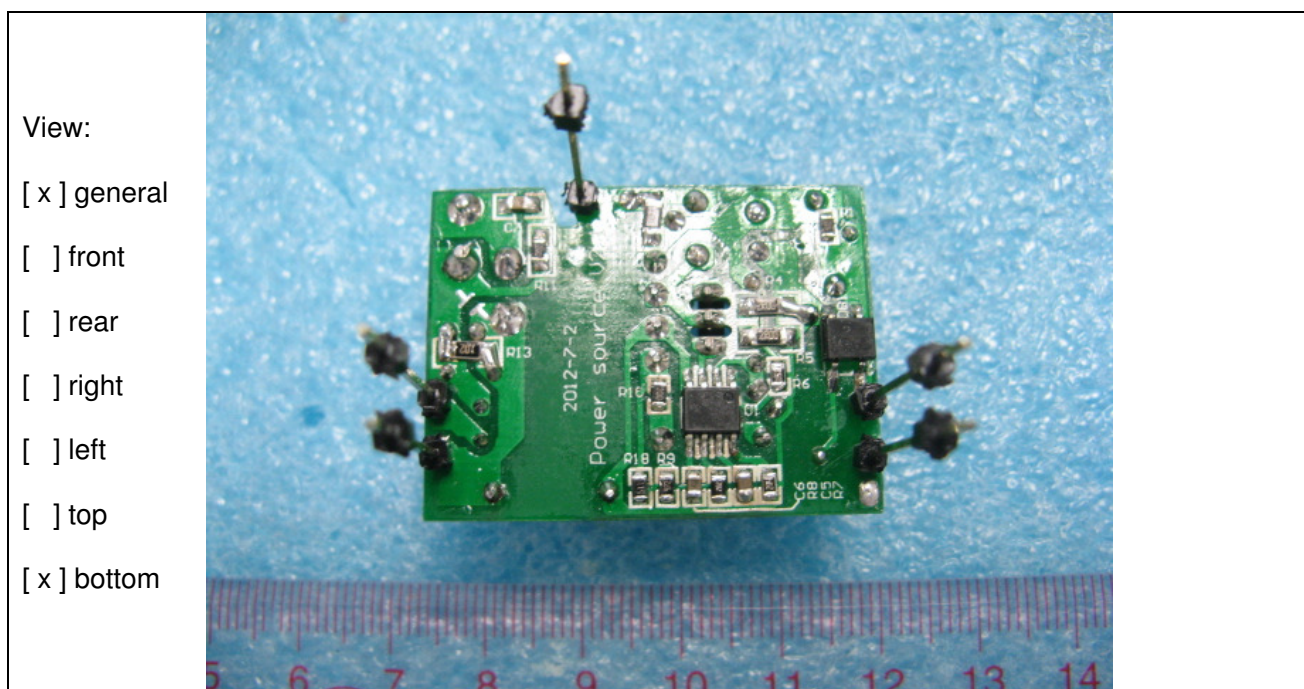
IEC 60950-1							
Clause	Requirement + Test			Result - Remark			Verdict
Pri. winding and sec. pins of T1	Reinforced insulation	520	232	AC 3000V	4,4	5,0	Yes
Iron core and sec. pins of T1	Reinforced insulation	520	232	AC 3000V	4,4	5,0	Yes
For model: UC-2A							
Pri. winding and sec. pins of T1	Reinforced insulation	515	232	AC 3000V	4,4	5,0	Yes
Iron core and sec. pins of T1	Reinforced insulation	515	232	AC 3000V	4,4	5,0	Yes
Loc.	Tested insulation			Test voltage/ V	Measured clearance / mm	Measured creepage dist./ mm	Measured distance thr. insul. / mm; number of layers
For model: UC-1A							
Pri. winding and sec. pins of T1	Reinforced insulation			AC 3000V	6,7	6,7	Two layers insulation tape equipped
Iron core and sec. pins of T1	Reinforced insulation			AC 3000V	5,7	5,7	Two layers insulation tape equipped
For model: UC-2A							
Pri. winding and sec. pins of T1	Reinforced insulation			AC 3000V	6,3	6,3	Two layers insulation tape equipped
Iron core and sec. pins of T1	Reinforced insulation			AC 3000V	5,3	5,3	Two layers insulation tape equipped
supplementary information:							

C.2	TABLE: transformers	N/A

Details of: UC-1A



Details of: UC-1A



Details of: UC-2A

View:

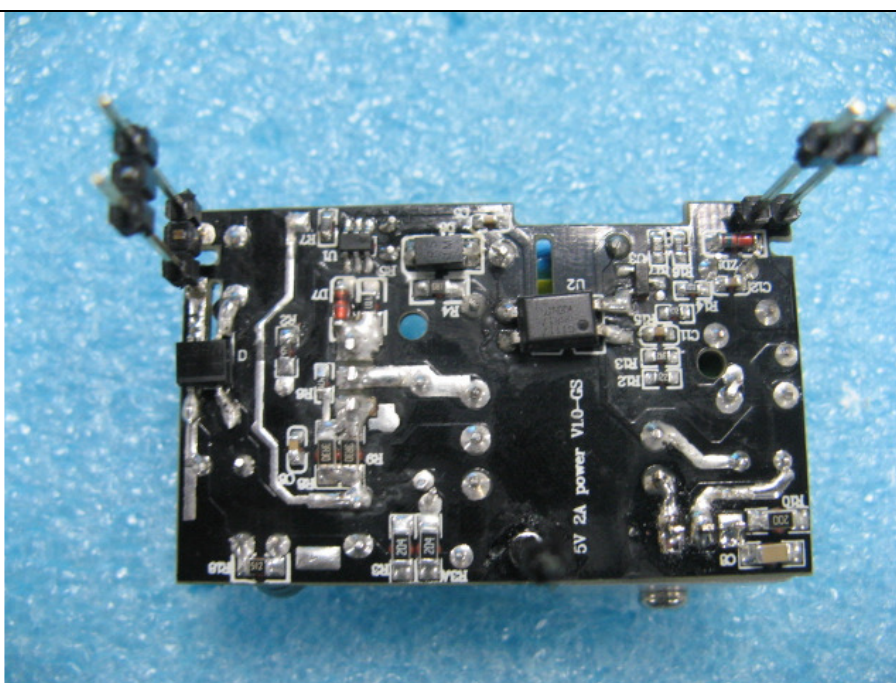
- general
- front
- rear
- right
- left
- top
- bottom



Details of: UC-2A

View:

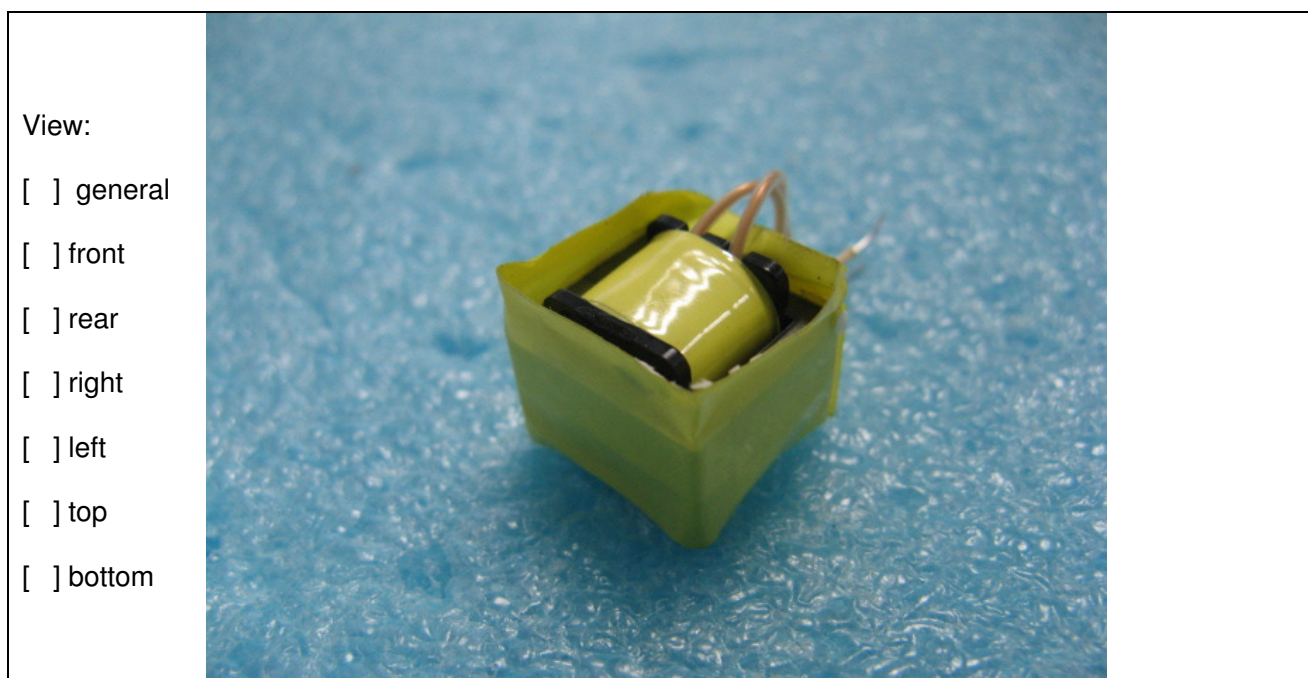
- general
- front
- rear
- right
- left
- top
- bottom



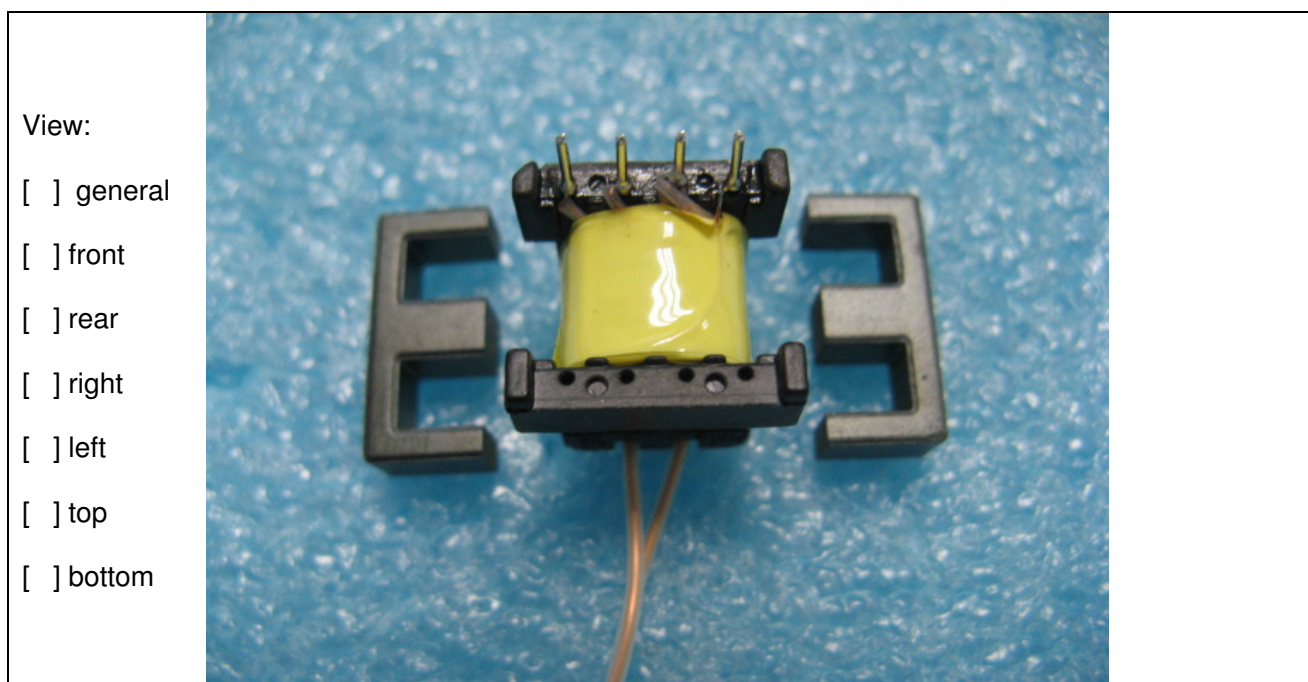
Details of: T1 of UC-1A



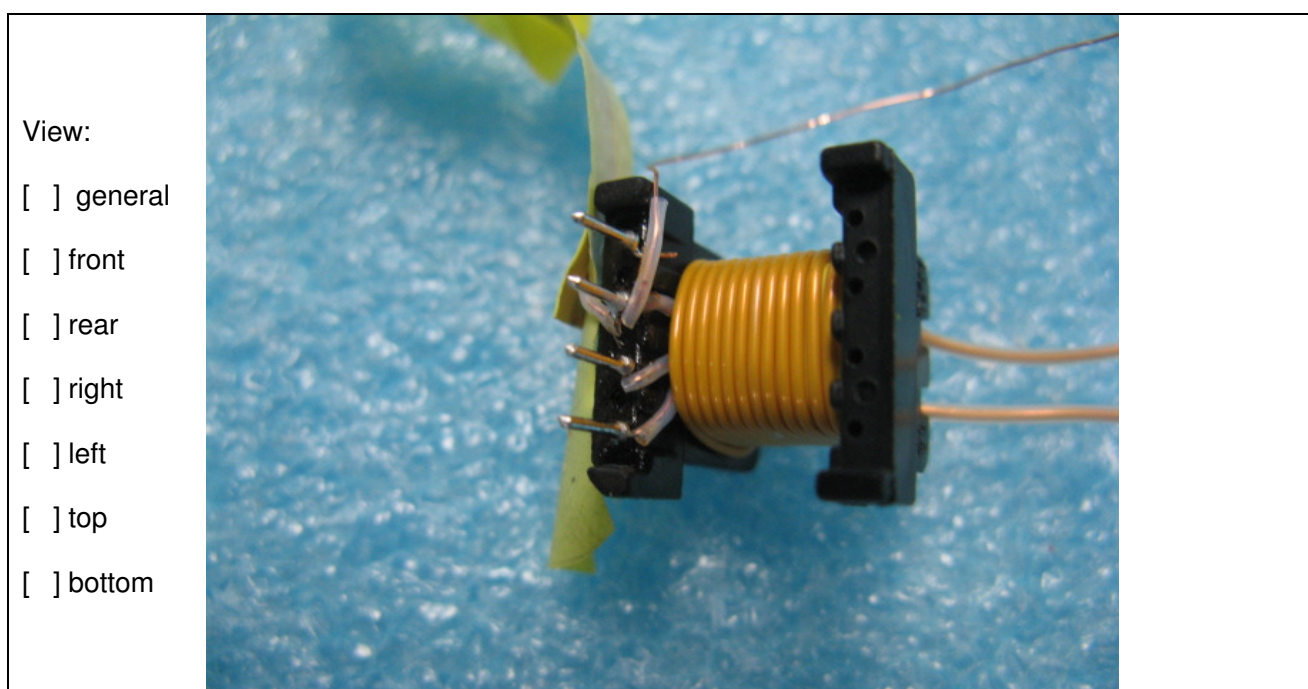
Details of: T1 of UC-1A



Details of: T1 of UC-1A



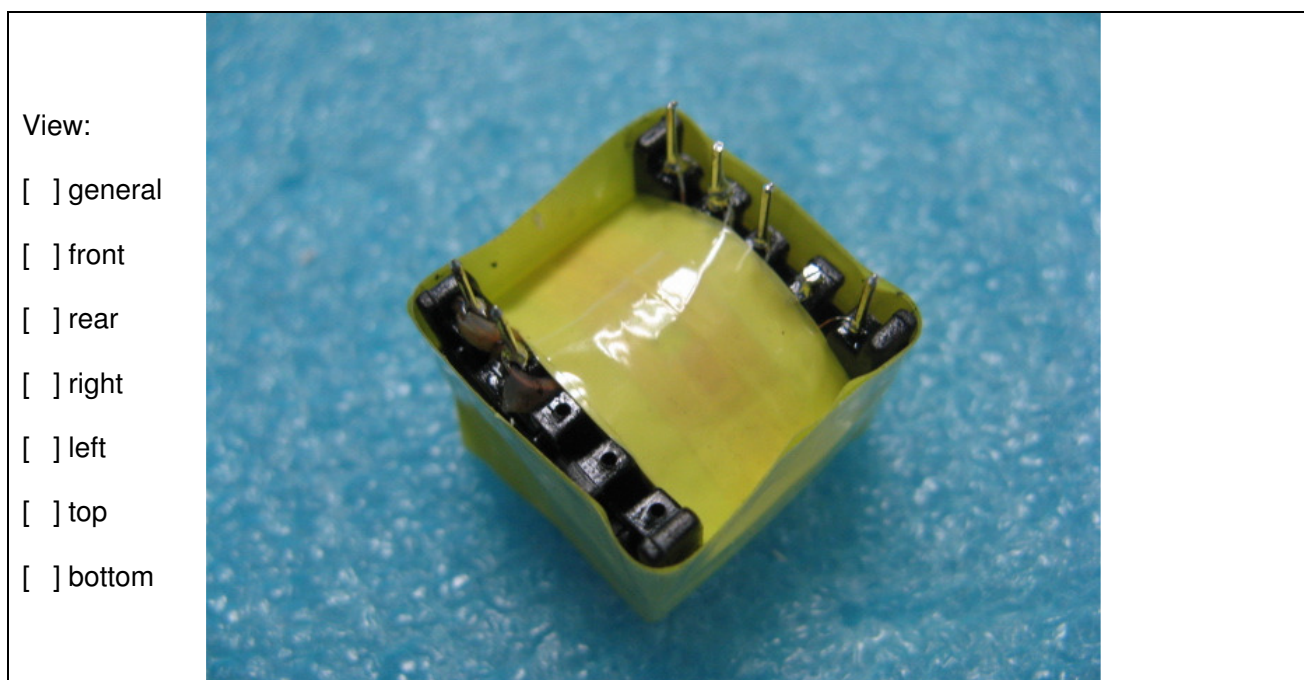
Details of: T1 of UC-1A



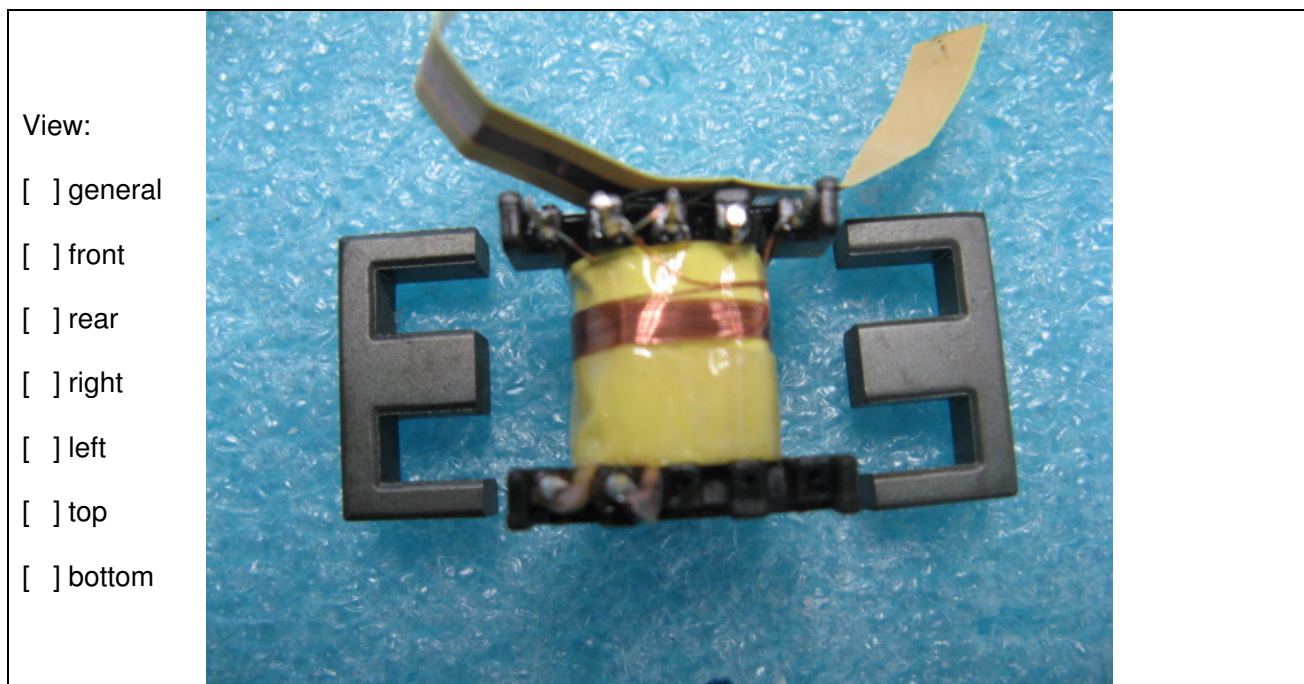
Details of: T1 of UC-2A



Details of: T1 of UC-2A



Details of: T1 of UC-2A



Details of: T1 of UC-2A

