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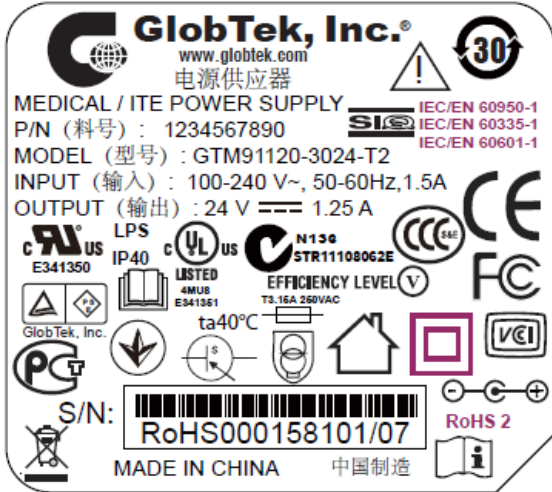
TEST REPORT IEC 61558-2-16 Safety of power transformers, power supplies, reactors and similar products for supply voltages up to 1100 V Part 2: Particular requirements and tests for switch mode power supply units and transformers for switch mode power supply units	
Report Number.....	T211-0359/15 M1
Date of issue.....	2015-06-24
Total number of pages	196
Applicant's name	GlobTek, Inc.
Address.....	186 Veterans Drive, Northvale, NJ 07647, USA
Test specification:	
Standard	IEC 61558-2-16:2009 (First Edition) + A1:2013 used in conjunction with IEC 61558-1 (Second Edition) + A1:2009
Test procedure	CB Scheme
Non-standard test method	N/A
Test Report Form No.	IEC61558_2_16B
Test Report Form(s) Originator	VDE Testing and Certification Institute
Master TRF	Dated 2014-03
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Test item description	Power Supply	
Trade Mark	GlobTek	
Manufacturer	GlobTek, Inc. 186 Veterans Drive, Northvale, NJ 07647, USA	
Model/Type reference	GT(M or -) 91120-WVVV-X.X-AB series (See general product information for details)	
Ratings	Input: 100-240 V~; 50-60 Hz; 1,5 A Output: See representative models in general product information.	
Testing procedure and testing location:		
<input checked="" type="checkbox"/>	CB Testing Laboratory:	SIQ Ljubljana <small>Testing Laboratory is accredited by Slovenian Accreditation, Reg. No.: LP-009</small>
Testing location/ address		Tržaška cesta 2, SI-1000 Ljubljana, Slovenia
<input type="checkbox"/>	Associated CB Testing Laboratory:	
Testing location/ address		
Tested by (name + signature)		Boštjan Grum 
Approved by (name + signature)		Tomaž Knez 
<input type="checkbox"/>	Testing procedure: TMP/CTF Stage 1:	
Testing location/ address		
Tested by (name + signature)		
Approved by (name + signature)		
<input type="checkbox"/>	Testing procedure: WMT/CTF Stage 2:	
Testing location/ address		
Tested by (name + signature)		
Witnessed by (name + signature)		
Approved by (name + signature)		
<input type="checkbox"/>	Testing procedure: SMT/CTF Stage 3 or 4:	
Testing location/ address		
Tested by (name + signature)		
Witnessed by (name + signature)		
Approved by (name + signature)		
Supervised by (name + signature).....		

<p>List of Enclosure (including a total number of pages in each attachment):</p> <ol style="list-style-type: none"> 1. Schematics, layouts, user manual, technical documentation – Enclosure No. 1; 2. Photos – Enclosure No. 2; 3. National variations – Enclosure No. 3 	
<p>Summary of testing:</p>	
<p>Tests performed (name of test and test clause): All applicable clauses – see test report for details.</p>	<p>Testing location: SIQ Ljubljana, Tržaška cesta 2, SI-1000 Ljubljana, Slovenia</p>
<p>Summary of compliance with National Differences: List of countries addressed: Australia and New Zealand</p> <p><input checked="" type="checkbox"/> The product fulfils the requirements of IEC 61558-2-16:2009 (First Edition) + A1:2013 used in conjunction with IEC 61558-1:2005 (Second Edition) + A1:2009</p> <p><input checked="" type="checkbox"/> The product fulfils the requirements of EN 61558-2-16:2009 + A1:2013 used in conjunction with EN 61558-1:2005 + A1:2009</p>	

Copy of marking plate (example):

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.



Test item particulars	Power Supply
Classification of installation and use	Desk top / direct plug-in power supply unit (Class I or Class II) Open-frame power supply unit, encapsulated power supply unit: Not defined, end product consideration
Supply Connection	Appliance inlet or plug (Desk top / direct plug-in construction) Input connector (Open frame construction) End product consideration (Encapsulated construction)
..... :	
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: (2015-05-14); (2015-06-04)	
Date (s) of performance of tests: (2015-05-15) – (2015-06-16)	
General remarks:	
"(See Enclosure No. #)" 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 4.2.5 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..... :	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> Not applicable
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies)	1) GlobTek, Inc. 186 Veterans Drive Northvale, NJ 07647, USA 2) GlobTek (Suzhou) Co., Ltd Building 4, No. 76, Jinling East Road, Suzhou Industrial Park, Jiangsu CN-215021, China
General product information:	
G(TM or -) 91120-WWVV-X.X-AB series M or – are for market identification 91120- series of power supply WW is the rated output wattage designation, with a maximum value of "30"; VV is the standard rated output voltage designation, with a maximum value of "48"; -X.X denotes the optional deviation, subtracted or added from standard output voltage in 0,1 volt increments or blank to indicate the no voltage different; A:T is External/Desktop or direct plug-in model, F is Open Frame, P is Encapsulated; when A=T, B can be 2 or 3 A, 2 presents Class II, 3 A presents Class I; when A=F, B can be Blank or W, W means class II equipment, Blank means class I; when A=P, B can be 2 or 3, 2 means class II equipment, 3 means class I equipment. GTM91128LI1CELE, GTM91128LI2CELE and GTM91128LI3CELE are external/desktop or direct plug-in power supplies.	

Power supply units are not end product. Review of instructions for use shall be performed with end product.
 Appliances were tested as unattended appliance according to the manufacturer specifications.
 During testing output ratings were applied (normal load - loaded to rated output).
 Power supplies are desk-top, direct plug-in, open frame or encapsulated. Power supplies are equipped with two fuses in line and in neutral. Secondary output circuit is separated from mains by reinforced insulation and rated SELV.
 The equipment has been evaluated for use in a Pollution Degree 2 and overvoltage category II.
 For the open frame and encapsulated power supply units a suitable Electrical and Fire enclosure shall be provided in the end equipment. For the desktop / direct plug-in power supply unit is provided with plastic enclosure made by non-flammable material UL94V-1. See also list of safety critical components.
 The product was evaluated for a maximum ambient of 40°C.





Model Differences:

Desktop / direct plug-in power supplies are provided with suitable external enclosure. The top and bottom parts of the enclosure are ultrasonic welded. Open frame and encapsulated power supplies are without external enclosure. The external enclosure has to be provided within the end product.

The desktop / direct plug-in power supply is rated class I or class II.
 The open frame and encapsulated power supply is rated class I or class II.













Model name	Output voltage [DC]	Output current	Max. output power
GT(M or -)91120-3007.5-2.5-AB	5 V	0-4,0 A	20 W
GT(M or -)91120-3007.5-X.X-AB	5,1-7,5 V	0-4,0 A	22,5 W
GT(M or -)91120-3010.5-X.X-AB	7,6-9 V	0-3,3 A	25 W
GT(M or -)91120-3010.5-X.X-AB	9,1-10,5 V	0-3,3 A	30 W
GT(M or -)91120-3014.5-X.X-AB	10,6-14,5V	0-2,83 A	30 W
GT(M or -)91120-3019.5-X.X-AB	14,6-19,5 V	0-2,0 A	30 W
GT(M or -)91120-3024-X.X-AB	19,6-24 V	0-1,6 A	30 W
GT(M or -)91120-3036-X.X-AB	24,1-36 V	0-1,25 A	30 W
GT(M or -)91120-3048-X.X-AB	36,1-48 V	0-0,83 A	30 W
GTM91128LI1CEL	4,2 V	1,0 A	--
GTM91128LI2CEL	8,4 V	1,0 A	--
GTM91128LI3CEL	12,6 V	1,0 A	--

History sheet			
Report No.	Date	Change	Revision No.
T211-0359/15	2015-06-22	Initial Test Report issued.	--
T211-0359/15 M1	2015-06-24	Test report revised due to additional alternative PCB, corrected output current of 5 V model (from 4 A to 0-4,0 A) and correction of model name.	1.0

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
8	MARKING AND OTHER INFORMATION		P
8.1	Transformer marked with:		-
	a) rated supply voltage or voltage range (V)	100-240 V~	P
	b) rated output voltage (V)	See general product information	P
	c) rated output (VA, kVA or W)		N/A
	d) rated output current (A)	See general product information	P
	e) rated frequency (Hz)	50-60 Hz	P
	f) rated power factor (if not 1)		N/A
	g) symbol AC for alternating current, or DC for direct current-output		P
	h) symbol for electrical function (according to one or more part's 2) in addition with the symbol for SMPS (IEC 61558-2-16:09)	For example:  	
	i) manufacturer's name or trademark or name of the responsible vendor	GlobTek	P
	j) model or type reference	See general product information	P
	k) vector group according to IEC 60076 for three-phase transformer		N/A
	l) symbol for Class II		P
	m) symbol for Class III		N/A
	n) index IPXX if other than IP00	IP40	P
	o) rated max. ambient temperature t_a (if not 25°C)	40°C	P
	p) rated minimum ambient temperature $t_{a \text{ min}}$, if <10°C and if a temperature sensitive device is used		N/A
	q) short-time duty cycle: operating time Intermittent duty cycle: operating and resting time (e.g. 5min/30min)		N/A
	r) for t_w -marked transformers marked with the rated max. operating temperature, increased by multiples of 5 (e.g. t_w 120; t_w 125)		N/A
	s) transformers used with forced air cooling shall be marked with "AF" in m/s		N/A
	t) Information from the manufacturer to the purchaser (data sheet) :		N/A
	– short-circuit voltage (% rated supply voltage) for stationary transformers > 1000 VA		N/A
	– electrical function of the transformer		N/A

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
8.2	Marking for transformers IP00 or for associated transformers: type and trademark, instruction sheets		N/A
8.3	Adjusted voltage easily and clearly discernible		P
8.4	For each tapping or winding: rated output voltage and rated output		N/A
	necessary connections clearly indicated		N/A
8.5	For short-circuit proof transformers or non-inherently short-circuit proof transformers:		N/A
	Rated current (A or mA) and symbol for time current characteristics of the fuses for non-inherently short-circuit proof transformer with incorporated fuses and non-short-circuit proof transformer	F	N/A
	Manufacturer's model or type reference and rating of the device for non-inherently short-circuit proof transformers with incorporated replaceable protective device (other than fuses)		N/A
	Construction sheet for transformers with replaceable protective device (other than fuses) information with information about the replacement.		N/A
8.6	Terminals for neutral: "N"		N/A
	Terminal for protective earth marked with earthing symbol		P
	Identification of input terminals: "PRI"	See general product information	P
	Identification of output terminals: "SEC"	See general product information	P
	Symbol for any point/terminal in connection with frame or core		N/A
8.7	Indication for correct connection		P
8.8	Instruction sheet for type X, Y, Z attachments		N/A
8.9	Transformer for indoor use shall be marked with the relevant symbol.		P
8.10	Symbol for Class II construction not confused with maker's name or trademark.		P
	Class II transformer with parts to be mounted – delivered with all parts for class II after mounting.		N/A
	Symbol for class II transformer placed on the part which provides class II.		N/A
8.11	Correct symbols:		-
	Volts	V	P
	Amperes	A (mA)	P
	Volt amperes (or volt-amperes reactive for reactors)	VA or (VAR)	N/A
	Watts	W	N/A

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	Hertz	Hz	P
	Input	PRI (Input)	P
	Output	SEC (Output)	P
	Direct current	d.c. (DC) or	P
	Neutral	N	N/A
	Single-phase a.c.		P
	Three-phase a.c.	3	N/A
	Three-phase and neutral a.c.	3/N	N/A
	Power factor	cos φ	N/A
	Class II construction		P
	Class III construction		N/A
	Fuse-link	F	N/A
	Rated max. ambient temperature	t_a40°C	P
	Frame or core terminal		N/A
	Protective earth		N/A
	IP number	IP40	P
	Earth (ground for functional earth)		P
	For indoor use only		P
	tw5 YYY		N/A
	tw10 YYY		N/A
	twx YYY		N/A
	Additional Symbols (IEC 61558-2-16:09)		P
	SMPS incorporating a Fail-safe separating transformer		N/A
	SMPS incorporating a Non-short-circuit-proof separating transformer		N/A
	SMPS incorporating a Short-circuit-proof separating transformer (inherently or non-inherently)		N/A
	SMPS incorporating a Fail-safe isolating transformer		N/A
	SMPS incorporating a Non-short-circuit-proof isolating transformer		N/A

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	SMPS incorporating a Short-circuit-proof isolating transformer (inherently or non-inherently)	 or 	N/A
	SMPS incorporating a Fail-safe safety isolating transformer		N/A
	SMPS incorporating a Non-short-circuit-proof safety isolating transformer		N/A
	SMPS incorporating a Short-circuit-proof safety isolating transformer (inherently or non-inherently)		P
	SMPS incorporating a Fail-safe auto-transformer	 or 	N/A
	SMPS incorporating a Non-short-circuit proof auto-transformer	 or 	N/A
	SMPS incorporating a Short-circuit proof auto-transformer (inherently or non-inherently)	 or 	N/A
	SMPS (Switch mode power supply unit)		P
8.12	Figures, letters or other visual means for different positions of regulating devices and switches	No switches or regulating devices	N/A
	OFF position indicated by figure 0		N/A
	Greater output, input etc. indicated by higher figure		N/A
8.13	Marking not on screws or other easily removable parts		P
	Marking clearly discernible (transformer ready for use)		P
	Marking for terminals clearly discernible if necessary after removal of the cover		N/A
	Marking for terminals: no confusion between input and output		P
	Marking for interchangeable protective devices positioned adjacent to the base	No interchangeable protective device	N/A
	Marking for interchangeable protective devices clearly discernible after removal of cover and protective device	No interchangeable protective device	N/A
8.14	Special information for installation (in the catalogue, data sheet, or instruction sheet) if necessary:	End product consideration	N/A
	For non-inherently short-circuit proof transformers with non-self-resetting or non-replaceable devices (weak-point, thermal link): The device cannot be reset or replaced		N/A

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	For transformers generating a protective earth conductor current of 10 mA (see also cl. 18.5.2): The installation shall be made according to the wiring rules.		N/A
	For associated- and IP00-transformers: At 10% over or under voltage in the supply voltage, the rated output of the transformer shall be selected accordingly.		N/A
	For stationary transformers exceeding 1000 VA: The short circuit voltage in % of the rated voltage		N/A
	For all transformers the electrical function: An information about the electrical function of the transformer (e.g. inherently short circuit proof safety isolating transformer)		N/A
	For associated- and IP00-transformers: The max. abnormal winding temperature		N/A
	For tw-transformers: The specific constant S is (e.g. S6 says S = 6000)		N/A
	For transformers with more than one output winding, not for series or parallel connection		N/A
	– an information in the instruction sheet: the transformer is not intended for series/parallel connection		N/A
	For IP00-transformers the test of 27.2 is not performed. The result may be affected by the enclosure in the final application.		N/A
8.15	Marking durable and easily legible		P

9	PROTECTION AGAINST ELECTRIC SHOCK		P
9.1	Protection against contact with hazardous live parts		P
9.1.1	A live part is not a hazardous live part if:		-
	– it is separated from the supply by double or reinforced insulation		P
	– the requirements of 9.1.1.1 or 9.1.1.2 are fulfilled		P
9.1.1.1	The touch voltage is ≤ 35 V(peak) a.c. or ≤ 60 Vd.c.		P
9.1.1.2	If the touch voltage is > 35 V (peak) a.c. or > 60 V d.c., the following requirements shall be fulfilled:		N/A
	The touch current shall not exceed:		-
	– for a.c. 0,7 mA (peak)		P
	– for d.c. 2,0 mA (see Annex J)		N/A
	In addition, when a capacitor is connected to live parts:		—

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Clause	Requirement + Test	Result - Remark	Verdict
9.1.1.2.1	discharge: < 45 μ C (between 60 V and 15 kV)		N/A
9.1.1.2.2	energy: \leq 350 mJ (voltage >15 kV)		N/A
9.1.2	Transformers shall have an adequate protection against accessibility to hazardous live parts:		P
	The enclosure of class I and class II transformers gives an adequate protection against accidental contact with hazardous live parts.	Class II	P
	Class I transformers: accessible parts are separated from hazardous live parts by at least basic insulation.		N/A
	Class II transformers: no accessibility to basic insulation, or conductive parts separated from hazardous live parts by basic insulation.		P
	Hazardous live parts are not accessible after removal of detachable parts.	No detachable parts	P
	Hazardous live parts are not accessible after removal of detachable parts except for:		N/A
	– lamps having caps larger B9 and E10		N/A
	– type D fuse holder		N/A
	Lacquers, enamel, paper, cotton, oxide film on metal parts not used for protection against accidental contact with hazardous live parts:		N/A
	Shafts, handles, operating levers, knobs are not hazardous life parts.		N/A
	Compliance is checked by inspection and by relevant tests according to IEC 60 529		N/A
	Class II transformers and Class II parts of Class I construction are tested with the test pin (fig. 3)		N/A
	Hazardous live parts shall not be touchable by test finger (fig. 2)		N/A
	for Class II transformers: metal parts separated by basic insulation from hazardous live parts not touchable by test finger		N/A
	hazardous live parts shall not be touchable with the test pin		N/A
9.1.3	Accessibility of non-hazardous live parts		-
	Non-hazardous live parts of the output circuit may be accessible if they are isolated from the input circuit by double or reinforced insulation and if the following conditions are fulfilled:		P
	– The no load output voltage is \leq 35 V peak a.c. or \leq 60 V ripple free d.c., both poles are accessible		P
	– The no load output voltage is > 35 V peak a.c. or > 60 V ripple free d.c. and \leq 250 V a.c., only one pole may be accessible		N/A

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
9.2	Transformers with primary supply plug: 1 s after the interruption of the supply the voltage between the pins do not exceed 35 V (peak) a.c. or 60 V ripple free d.c.		N/A
	Transformers without a primary supply plug: 5 s after the interruption of the supply the voltage between the input terminals do not exceed 35 V (peak) a.c. or 60 V ripple free d.c.	Open frame and encapsulated version	P
	The following tests are required :		-
	If the nominal capacitance is $\leq 0,1 \mu\text{F}$ – no test is conducted.		P
	– 10 times switch the supply source on and off, or use a special equipment for to switch off at the most unfavourable electrical angle		P
	If the measured voltage is $> 60 \text{ V}$ ripple free d.c., the discharge must be $\leq 45 \mu\text{C}$.		N/A

10	CHANGE OF INPUT VOLTAGE SETTING		P
	Voltage setting not possible to change without a tool		P
	Different rated supply voltages:		-
	– indication of voltage for which the transformer is set, is discernible on the transformer.		N/A
10.101	A wide range of the input (120 V a. c., to 240 V a.c voltage is allowed (IEC 61558-2-16:09):	100-240 V~	P
	– if the output voltages does not exceed the rated output voltage		P
	– if the no-load voltage does not exceed the limits of output voltage deviation		P

11	OUTPUT VOLTAGE AND OUTPUT CURRENT UNDER LOAD		P
11.1	Difference from rated value (without rectifier; with rectifier):	dc output	P
	a) inherently short-circuit proof transformers with one rated output voltage for output voltage: a.c. $\leq 10\%$; d.c. $\leq 15\%$		N/A
	b) inherently short-circuit proof transformers with one more than 1 rated output voltage for highest output voltage: a.c. $\leq 10\%$; d.c. $\leq 15\%$		N/A
	c) idem for other output voltages: a.c. $\leq 15\%$; d.c. $\leq 20\%$		N/A
	d) other transformers for output voltages: a.c. $\leq 5\%$; d.c. $\leq 10\%$	(see appended table)	P

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
12	NO-LOAD OUTPUT VOLTAGE (see supplementary requirements in Part 2)		P
	Remark: with rectifier measuring on both sides of the rectifier		N/A
12.101	The no load output voltage shall not exceed (IEC 61558-2-16:09):		-
	– For SMPS incorporating separating or auto-transformers: 1000V a.c. or 1415 V ripple free d.c.		N/A
	– For SMPS including isolating transformers: 500 V a.c. or 708 V ripple-free d.c.		N/A
	– For SMPS including safety isolating transformers: 50 V a.c. or 120 V ripple-free d.c.		P
	For independent transformers , this output voltage limitation applies even when output windings, not for interconnection, are connected in series		N/A
12.102	The difference between output voltage at no load and the output voltage measured in clause 11 does not exceed the values of table 101 (IEC 61558-2-16:2009), Rated output (VA) Rated value %	≤ 63 VA (allowed ratio: 20 %) Calculated: + 9,7 %	P

13	SHORT-CIRCUIT VOLTAGE		N/A
	Difference from marking for short-circuit voltage ≤ 20%		N/A

14	HEATING		P
14.1	General requirements		P
	No excessive temperature in normal use		P
	Room temperature: rated ambient temperature $t_a \pm 5^\circ\text{C}$	40°C	—
	Type X, Y, Z attachments: 1 pull (5 N) to the connection windings		N/A
	U_{pri} (V): 1,1 times rated supply voltage loaded with rated impedance – for independent transformers		—
	U_{pri} (V): 1,1 times rated supply voltage: with 1 sec (A), measured with rated impedance and 1,0 times of the rated supply voltage for others than independent transformers	100 V x 1,1 = 110 V; 240 V x 1,1 = 264 V;	—
	Type X, Y, Z attachments: 1 pull (5 N) to the connection windings		N/A
	Max. temperature windings.....	(see appended table)	P
	– Class A: ≤ 100°C		N/A
	– Class E: ≤ 115°C		N/A
	– Class B: ≤ 120°C		P

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Clause	Requirement + Test	Result - Remark	Verdict
	– Class F: $\leq 140^{\circ}\text{C}$		N/A
	– Class H: $\leq 165^{\circ}\text{C}$		N/A
	– other classes		N/A
	Temperature of external enclosures of stationary transformers:		N/A
	– metal: $\leq 70^{\circ}\text{C}$		N/A
	– other material: $\leq 80^{\circ}\text{C}$		N/A
	Temperature of external enclosure of stationary transformer $\leq 85^{\circ}\text{C}$ (not touchable with the IEC test finger)		N/A
	Temperature of external enclosures, handles, etc. of portable transformers:		P
	– continuously held parts of metal: $\leq 55^{\circ}\text{C}$		N/A
	– continuously held parts of other material: $\leq 75^{\circ}\text{C}$		N/A
	– not continuously held parts of metal: $\leq 60^{\circ}\text{C}$		N/A
	– not continuously held parts of other material: $\leq 80^{\circ}\text{C}$		P
	Temperature of terminals for external conductors $\leq 70^{\circ}\text{C}$		P
	Temperature of terminals of switches $\leq 70^{\circ}\text{C}$		N/A
	Temperature of internal and external wiring:		P
	– rubber: $\leq 65^{\circ}\text{C}$		N/A
	– PVC: $\leq 70^{\circ}\text{C}$		P
	Temperature of parts where safety can be affected:		N/A
	– rubber: $\leq 75^{\circ}\text{C}$		N/A
	– phenol-formaldehyde: $\leq 105^{\circ}\text{C}$		N/A
	– urea-formaldehyde: $\leq 85^{\circ}\text{C}$		N/A
	– impregnated paper and fabric: $\leq 85^{\circ}\text{C}$		N/A
	– impregnated wood: $\leq 85^{\circ}\text{C}$		N/A
	– PVC, polystyrene and similar thermoplastic material: $\leq 65^{\circ}\text{C}$		N/A
	– varnished cambric: $\leq 75^{\circ}\text{C}$		N/A
	Temperature rise of supports $\leq 85^{\circ}\text{C}$		P
	Temperature of printed boards:		P
	– bonded with phenol-formaldehyde: $\leq 105^{\circ}\text{C}$		N/A
	– melamine-formaldehyde: $\leq 105^{\circ}\text{C}$		N/A
	– phenol-furfural: $\leq 105^{\circ}\text{C}$		N/A
	– polyester: $\leq 105^{\circ}\text{C}$		N/A

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	– bonded with epoxy: $\leq 140^{\circ}\text{C}$		P
	Electric strength between input and output windings (18.3, 1 min); test voltage (V)		P
14.101	Winding temperature measured by thermocouples at the surface of the winding (IEC 61558-2-16:09)		P
	– if the internal frequencies is $> 1\text{kHz}$		P
	– the values of Table 1 for windings temperatures are reduced by 10°C		P
14.2	Application of 14.1 or 14.3 according to the insulation system		N/A
14.2.1	Class of isolating system (classified materials according to IEC 60 085 and IEC 60 216)		N/A
14.2.2	No classified material, or system but the measured temperature does not exceed the value of Class A		N/A
14.2.3	No classified material or system but the measured temperature exceeds the value for Class A, the live parts of the transformers are submitted to the test of 14.3		N/A
14.3	Accelerated ageing test for undeclared class of isolating system		N/A
	Cycling test (10 cycles):		N/A
	– measuring of the no-load input current (mA)		N/A
14.3.1	– heat run (temperature in table 2)		N/A
14.3.2	– vibration test: 30 min; amplitude 0,35 mm; frequency range: 10 Hz, 55 Hz, 10 Hz		N/A
14.3.3	– moisture treatment (48 h, 17.2)		N/A
14.3.4	Measurements and tests at the beginning and after each test:		N/A
	– deviation of the no-load input current, measured at the beginning of the test is $\leq 30\%$		N/A
	– insulation resistance acc. cl.18.1 and 18.2		N/A
	– electric strength, no breakdown (18.3); 2 min; test voltage 35% of specified value (table VI)		N/A
	– Transformers (50 or 60 Hz version) are tested after the dielectric strength test as follows: under no load; duration: 5 min; $U_{pri}(V)$: 1,2 times rated supply voltage; frequency (Hz): 2 times rated frequency		N/A
15	SHORT-CIRCUIT AND OVERLOAD PROTECTION		P
15.1	General		P
	Tests direct after 14.1 at the same t_a and without changing position.	(see appended table)	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Supply voltage between 0,9 times and 1,1 times of the rated supply voltage	90 V and 264 V	—
	Transformer with rectifier tests of 15.2 and 15.3 at the input and the output terminals of the rectifier.		N/A
	Transformers with more than one output winding or tapping, all windings tested with normal load, the winding with the highest temperature is short circuited.		N/A
	Wiring protected inherently (15.2)		N/A
	– Max. temperature of winding protected inherently (insulation class): ≤ 150°C (A); ≤ 165°C (E); ≤ 175°C (B); ≤ 190°C (F); ≤ 210°C (H)		N/A
	Winding protected by protective device:		P
	– Test according 15.3.2 - 15.3.3 – 15.3.4: max. temperature of winding during the time required or the time T given in table 4 (a) (insulation class): ≤ 200°C (A); ≤ 215°C (E); ≤ 225°C (B); ≤ 240°C (F); ≤ 260°C (H)		N/A
	– Test according 15.3.1: max. temperature of winding during the first hour, peak value (insulation class): ≤ 200°C (A); ≤ 215°C (E); ≤ 225°C (B); ≤ 240°C (F); ≤ 260°C (H)		P
	– Test according 15.3.1: max. temperature of winding after first hour, peak value (insulation class): ≤ 175°C (A); ≤ 190°C (E); ≤ 200°C (B); ≤ 215°C (F); ≤ 235°C (H)		P
	– Test according 15.3.1: max. temperature of winding after first hour, arithmetic mean value (insulation class): ≤ 150°C (A); ≤ 165°C (E); ≤ 175°C (B); ≤ 190°C (F); ≤ 210°C (H)		N/A
	Max. temperature of external enclosures (accessible by test finger) ≤ 105°C		P
	Max. temperature of insulation of wiring (rubber and PVC) ≤ 85°C		P
	Temperature rise of supports ≤ 105°C		P
15.2	For inherently short-circuit proof transformers and for transformers with rectifiers test by short circuit of the output winding at rated supply voltage x 1,1: temperature rises ≤ values in table 3		N/A
15.3	For non-inherently short-circuit proof transformers and for transformers with rectifiers: temperature rises ≤ values in table 3		P
15.3.1	Output terminals short-circuited: protection device operates, test at 0,9 ... 1,1 of the rated supply voltage	(see appended table)	P
15.3.2	If protected by a fuse accordance with either IEC 60 269-2 or IEC 60 269-3, or a technical equivalent fuse, the transformer is loaded as in table 4.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
15.3.3	If protected by a fuse accordance with either IEC 60 127 or ISO 8820, or a technical equivalent fuse, the transformer is loaded with the current as specified for the longest pre arcing time. <i>If protected by a miniature fuses in accordance to IEC 60127, 1,5 times of the rated fuse, until steady state condition (in addition)</i>		P
15.3.4	If protected by a circuit-breaker according to IEC 60 898 the transformer is loaded with a current equal to 1,45 times the value of the circuit-breaker rated current		N/A
15.3.5	If other overload protection than a fuse (IEC 60 127) or a circuit-breaker (IEC 60 898) test with 0,95 times of operating current		N/A
	If an internal weak point is used, the test must be repeated with two new samples. The two additional samples works similar to the first sample. Temperatures in the limit of table 3		P
15.4	For non-short-circuit proof transformers: temperature rises \leq values in table 3, tests as indicated in 15.3		N/A
15.5	For fail-safe transformers:		N/A
15.5.1	Three additional new specimens are used		—
	– U_{pri} (V): 1,1 times rated supply voltage		—
	– I_{sec} (A): 1,5 times rated output current		—
	– time until steady-state conditions t_1 (h)		—
	– time until failure t_2 (h): $\leq t_1$; ≤ 5 h		N/A
15.5.2	During the test:		N/A
	– no flames, molten material, etc.		N/A
	– temperature of enclosure $\leq 175^\circ\text{C}$		N/A
	– temperature of plywood support $\leq 125^\circ\text{C}$		N/A
	After the test:		N/A
	– electric strength (Cl. 18, 1 min, test voltage: 35% of specified value); no flashover or breakdown for primary-to-secondary only for safety isolating, isolating and separating transformer and for primary-to-body for all kinds of transformer		N/A
	– bare hazardous live parts not accessible by test finger through holes of enclosure		N/A
15.101	Electronic circuits of the SMPS fulfil the requirements of Annex H of part 1 . After a fault: no electric shock, no fire hazard and no unintentional operation.	(Details see Annex H)	P

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Clause	Requirement + Test	Result - Remark	Verdict
16	MECHANICAL STRENGTH		P
16.1	General		P
	After tests of 16.2, 16.3 and 16.4		P
	– no damage		P
	– hazardous live parts not accessible by test pin according to 9.2		P
	– no damage for insulating barriers		P
	– handles, levers, etc. have not moved on shafts		N/A
16.2	Transformers (stationary and portable s. 16.1)		P
	For stationary and portable transformers: 3 blows, impact energy 0,5 Nm		P
16.3	Portable transformers (except of plug in transformers)		P
	For portable transformers: 100 falls, 25 mm		P
16.4	Transformers with integrated pins (plug in transformers), the following tests are carried out:		P
	a) plug-in transformers: tumbling barrel test: 50 x ≤ 250 g; 25 x > 250 g	< 250 g; 50x	P
	b) torque test of the plug pins with 0,4 Nm		P
	c) pull force according to table 5 for each pin		P

17	PROTECTION AGAINST HARMFUL INGRESS OF WATER AND MOISTURE		P
17.1	Degree of protection (IP code marked on the transformer)	IP40	P
	Test according to 17.1.1 and for other IP ratings test according to IEC 60 529:		P
	– stable operating temperature before starting the test for < IPX8		N/A
	– transformer mounted and wired as in normal use		N/A
	– fixed transformer mounted as in normal use by the tests according to 17.1.1 A to L		N/A
	– portable transformers placed in the most unfavourable position and wired as in normal use		P
	– glands tightened with a torque equal to two-thirds of 25.6		N/A
	After the tests:		-
	– dielectric strength test according to 18.3		P
	Inspection:		-
	a) in dust-proof transformers no deposit of talcum powder		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	b) no deposit of talcum powder inside dust-tight transformers		N/A
	c) no trace of water on live parts except SELV parts below 15 V ac or 25 V dc or insulation if hazard for the user or surroundings no reduction of creepage distances		N/A
	d) no accumulation of water in transformers \geq IPX1 so as to impair safety		N/A
	e) no trace of water entered in any part of water-tight transformer		N/A
	f) no entry into the transformer by the relevant test probe		N/A
17.1.1	Tests on transformers with enclosure:		P
	A) Solid-object-proof transformers:		N/A
	- 2 IP2X test finger (IEC 60 529) and test pin (fig. 3)		N/A
	B) Solid-object-proof transformers:		P
	- wire 2,5 mm; force 3 N		N/A
	- IP4X, wire 1 mm; force 1 N		P
	C) Dust-proof transformers, IP5X; dust chamber according to IEC 60 529, fig. 2:		N/A
	a) transformer has operating temperature		N/A
	b) transformer, still operating, is placed in the dust chamber		N/A
	c) the door of the dust chamber is closed		N/A
	d) fan/blower is switched on		N/A
	e) after 1 min transformer is switched off for cooling time of 3 h		N/A
	A) Dust-tight transformers (IP6X) test according to C)		N/A
	B) Drip-proof transformers (IPX1) test according to fig. 3 of IEC 60 529 for 10 min		N/A
	C) Rain-proof transformers (IPX2) test according to fig. 3 of IEC 60 529 for 10 min in operation, any angle up to 15°		N/A
	D) Spray proofed transformers (IPX3) test according to fig. 4 of IEC 60 529 for 10 min in operation and 10 min switched off, time for complete oscillation (2 x 120°) is 4 sec.		N/A
	E) Splash-proof transformers (IPX4) test according to fig. 4 of IEC 60 529 (see F) for 10 min in operation and 10 min switched off (the tube shall oscillate \approx 360°)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	F) Jet-proof transformer (IPX5) test according to fig. 6 of IEC 60 529 (nozzle 6,3 mm)		N/A
	G) Powerful Jet-proof transformer (IPX6) test according to fig. 6 of IEC 60 529 (nozzle 12 mm)		N/A
	H) Watertight transformers (IPX7)		N/A
	I) Pressure watertight transformers (IPX8)		N/A
17.2	After moisture test (48 h for \leq IP20, 168 h for other transformers):	168 h	P
	– insulation resistance and electric strength (Cl. 18)	Input-Output; Input-Enclosure: $>100 \text{ M}\Omega$; 4000 V~	P

18	INSULATION RESISTANCE AND ELECTRIC STRENGTH		P
18.2	Insulation resistance between:		-
	– live parts and body for basic insulation $\geq 2 \text{ M}\Omega$		N/A
	– live parts and body for reinforced insulation $\geq 7 \text{ M}\Omega$	(see appended table)	P
	– input circuits and output circuits for basic insulation $\geq 2 \text{ M}\Omega$		N/A
	– input circuits and output circuits for double or reinforced insulation $\geq 5 \text{ M}\Omega$	(see appended table)	P
	– each input circuit and all other input circuits connected together $\geq 2 \text{ M}\Omega$		N/A
	– each output circuit and all other output circuits connected together $\geq 2 \text{ M}\Omega$		N/A
	– hazardous live parts and metal parts with basic insulation (Class II transformers) $\geq 2 \text{ M}\Omega$		N/A
	– body and metal parts with basic insulation (Class II transformers) $\geq 5 \text{ M}\Omega$	(see appended table)	P
	– metal foil in contact with inner and outer surfaces of enclosures $\geq 2 \text{ M}\Omega$	(see appended table)	P
18.3	Electric strength test (1 min): no flashover or breakdown:		P
	1) basic insulation between input circuits and output circuits; working voltage (V); test voltage (V)		N/A
	2) double or reinforced insulation between input circuits and output circuits; working voltage (V); test voltage (V)	(see appended table)	P
	3) basic or supplementary insulation between:		P
	a) live parts of different polarity; working voltage (V); test voltage (V)	(see appended table)	P
	b) live parts and the body if intended to be connected to protective earth		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	c) inlet bushings and cord guards and anchorages		N/A
	d) live parts and an intermediate conductive part		N/A
	e) intermediate conductive parts and body		N/A
	4) Reinforced insulation between the body and live parts; working voltage (V); test voltage (V) :	(see appended table)	P
	5) Functional insulation for windings intended to be connected in series or parallel (test voltage = working voltage + 500 V) (IEC 61558-2-16:09)		N/A
18.4	Does not apply (IEC 61558-2-16:09)		-
18.101	Impulse test according Table F5 of IEC 60664-1 with 1,2/50 μ s (IEC 61558-2-16)		P
	– After the test of 18.3, 10 impulses of each polarity between input and output terminals		P
	– During the tests no breakdown of the insulation between turns of a winding, between input and output circuits, or between windings and any conductive core		P
18.102 (A1)	Partial discharge tests according to IEC 60664-1 , if the working voltage is > 750 V peak		N/A
	Partial discharge is \leq 10 pC at time P2 See Fig. 19.101		N/A
18.5	Touch current and protective earth current		P
18.5.1	Touch current		P
	Touch current measured after the clause 14 test (hot) for class I and class II transformers (class II transformers with metal foil at the plastic surface). The test circuit according figure 8. Measuring network according Figure J1 (Annex J). If the frequency is >30kHz, measuring across the 500 Ohm resistor of J1 (burn effects).		P
	Measurement of the touch current with switch p of picture 8 in both positions and in combination with switches e and n. The measured values are less than the required values of table 8b.		P
	– switches n and e in on position		P
	– switch n: off and switch e: on		P
	– switch n: on and switch e: off		P
18.5.2	Protective earth conductor current		-
	The transformer is connected as in clause 14 Impedance of the ammeter < 0,5 Ohm, connected between earth terminal of the transformer and protective earth conductor		P

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Clause	Requirement + Test	Result - Remark	Verdict

	The measured values are less than the required values of table 8b.		P
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19	CONSTRUCTION		P
19.1	Separation of input and output circuits		P
19.1.1	SMPS incorporating auto-transformers (IEC 61558-2-16:2009)		N/A
19.1.1.1	For plug connected auto-transformers with rated input voltage > rated output voltage the potential to earth shall not exceed the rated output voltage. (IEC 61558-2-16:2009)		N/A
19.1.1.2	SMPS with polarised input and output plug and socket-outlet system: an instruction is given with the information, that the transformer shall not be used with non-polarised plug and socket outlet system. (IEC 61558-2-16:2009)		N/A
19.1.1.3	A polarity detecting device only energises the output in the case: output potential to earth \leq rated output voltage, also with reversed input plug. (IEC 61558-2-16:2009)		N/A
	– The contact separation of the device is \geq 3 mm		N/A
	– A current to earth does not exceed 0,75 mA.		N/A
	– All tests are repeated under fault conditions of H.2.3 of annex H of part 1. The potential to earth does not exceed the max output voltage for more than 5 s.		N/A
19.1.2	SMPS incorporating separating transformers (IEC 61558-2-16:09)		N/A
19.1.2.1	Input and output circuits electrically separated. (IEC 61558-2-16:09)		N/A
19.1.2.2	The insulation between input and output winding(s) consist of basic insulation (IEC 61558-2-16:09)		N/A
	Class I SMPS		N/A
	– Insulation between input windings and body consist of basic insulation		N/A
	– Insulation between output windings and body consist of basic insulation		N/A
	Class II SMPS (IEC 61558-2-16:2009)		N/A
	– Insulation between input windings and body consist of double or reinforced insulation		N/A
	– Insulation between output windings and body consist of double or reinforced insulation		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
19.1.2.3	The insulation between input windings and intermediate conductive parts and the output windings and intermediate part consist of basic insulation (IEC 61558-2-16:09)		N/A
	For class I SMPS the insulation between input and output windings via the intermediate conductive parts consist of basic insulation (IEC 61558-2-16:2009)		N/A
	For class II SMPS the insulation between input winding and the body and between the output windings and the body via the intermediate conductive parts consist of double or reinforced insulation. (IEC 61558-2-16:2009)		N/A
19.1.2.4	Parts of output circuits may be connected to protective earth (IEC 61558-2-16:09)		N/A
19.1.2.5	No direct contact between output circuits and the body, unless: (IEC 61558-2-16:2009)		N/A
	– Allowed for associated transformers by the equipment standard		N/A
	– Clause 19.8 of part 1 is fulfilled		N/A
19.1.3	SMPS incorporating isolating transformers and safety isolating transformers (IEC 61558-2-16:09)		P
19.1.3.1	Input and output circuits electrically separated (IEC 61558-2-16:09)		P
	No possibility of any connection between these circuits		P
19.1.3.2	The insulation between input and output winding(s) consist of double or reinforced insulation (exception see 19.1.3.4) (IEC 61558-2-16:09)		P
	Class I SMPS not intended for connection to the mains by a plug:		—
	– Insulation between input windings and body connected to earth consist of basic insulation rated to the input voltage		N/A
	– Insulation between output windings and body, connected to earth consist of basic insulation rated for the output voltage		N/A
	Class I SMPS intended for connection to the mains by a plug (EN 61558-2-16:09):		N/A
	– Insulation between input windings and body connected to earth consist of basic insulation rated to the working voltage		N/A
	– Insulation between output windings and body, connected to earth consist of supplementary insulation rated for the working voltage		N/A
	Class II SMPS (IEC 61558-2-16:2009)		P

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Clause	Requirement + Test	Result - Remark	Verdict
	– Insulation between input windings and body consist of double or reinforced insulation rated to the input voltage		P
	– Insulation between output windings and body consist of double or reinforced insulation, rated to the output voltage		P
19.1.3.3	SMPS with intermediate conductive parts not connected to the body (between input/output) (EN 61558-2-16:09):		-
19.1.3.3.1	For class I and class II SMPS the insulation between input and output windings, via intermediate conductive parts, consist of double or reinforced insulation, rated to the working voltage (EN 61558-2-16:09).		P
	– For class II SMPS the insulation between input winding and the body and between the output windings and the body via the intermediate conductive parts consist of double or reinforced insulation. (rated to the input voltage, for SELV circuits only basic insulation to the body)		P
	– For transformers, different from independent, the insulation between input and output windings, via intermediate conductive parts, consist of double or reinforced insulation, rated to the working voltage.		N/A
19.1.3.3.2	Class I transformers with earthed core, and not allowed for class II equipment (EN 61558-2-16:09)		N/A
	– Insulation from the input to the earthed core: basic insulation rated for the input voltage		N/A
	– Insulation from the output voltage to the earthed core: basic insulation rated for the output voltage		N/A
19.1.3.3.3	Insulation between: input to intermediate conductive parts and output and intermediate parts consist of at least basic insulation (EN 61558-2-16:09)		N/A
	– If the insulation from input or output to the intermediate metal part is less than basic insulation, the part is considered to be connected to input or output.		N/A
19.1.3.4	For class I SMPS, with protective screen, not connected to the mains by a plug the following conditions comply (EN 61558-2-16:09):		N/A
	– The insulation between input winding and protective screen consist of basic insulation (rated input voltage)		N/A
	– The insulation between output winding and protective screen consist of basic insulation (rated output voltage)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	– The protective screen consist of metal foil or a wire wound screen extending the full width of the windings and has no gaps or holes		N/A
	– Where the protective screen does not cover the entire width of the input winding, additional insulation to ensure double insulation in this area, is used.		N/A
	– If the screen is made by a foil, the turns are isolated, overlap at least 3 mm		N/A
	– The cross-section of the screen and the lead out wire is at least corresponding to the rated current of the overload device		N/A
	– The lead out wire is soldered or fixed to the protective screen.		N/A
	Protective screening is not allowed for SMPS with plug connection to the mains (EN 61558-2-16:09)		N/A
19.1.3.5	No connection between output circuit and protective earth, except of associated transformers (allowed by equipment standard) or 19.8 is fulfilled (EN 61558-2-16:09).	No protective earth	N/A
19.1.3.6	No connection between output circuit and body, except of associated transformers (allowed by equipment standard) (EN 61558-2-16:09)		N/A
19.1.3.7	The distance between input and output terminals for the connection of external wiring is ≥ 25 mm	No terminals	N/A
19.1.3.8	Portable SMPS having an rated output ≤ 630 VA (EN 61558-2-16:09)		P
19.1.3.9	No connection between output circuit and body except of associated transformers (allowed by equipment standard) (EN 61558-2-16:09)		N/A
19.1.3.10	Protective screening is not allowed for SMPS with plug connection to the mains (EN 61558-2-16:09)	No protective screening	N/A
19.2	Fiercely burning material not used		P
	Unimpregnated cotton, silk, paper and fibrous material not used as insulation		P
	Wax-impregnated, etc. not used		P
19.3	Portable transformer: short-circuit proof or fail-safe	Short-circuit proof	P
19.4	Class II transformers: contact between accessible metal parts and conduits or metal sheaths of supply wiring impossible	No accessible metal parts	N/A
19.5	Class II transformers: part of supplementary or reinforced insulation, during reassembly after routine servicing not omitted		N/A
19.6	Class I and II transformers: creepage distances and clearances over supplementary or reinforced insulation if wire, screw, nut, etc. become loose or fall out of position not $\leq 50\%$ specified values (Cl. 26)		P

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Clause	Requirement + Test	Result - Remark	Verdict
19.7	Conductive parts connected to accessible metal parts by resistors or capacitors shall be separated from hazardous live parts by double or reinforced insulation		N/A
19.8	Resistors or capacitors connected between hazardous live parts and the body (accessible metal parts) consist of:		N/A
	– components according to IEC 60 065, 14.1 or capacitor Y1 according to IEC 60 384-14		N/A
	– at least two separate components		N/A
	– if one component is short-circuited or opened, values specified in Cl. 9 shall not be exceeded		N/A
	– if the working voltage is ≤ 250 V, one Y1 capacitor according 60384-14 is allowed		N/A
19.9	Insulation material input/output and supplementary insulation of rubber resistant to ageing		N/A
	Creepage distances (if cracks) \geq specified values (Cl. 26)		N/A
19.10	Protection against accidental contact by insulating coating:		N/A
	a) ageing test (section I, IEC 60 068-2-2), test Ba: 168 h; 70°C		N/A
	b) impact test (spring-operated impact hammer according to IEC 60 068-2-63; $0,5 \pm 0,05$ J)		N/A
	c) scratch test (hardened steel pin) electric strength test according to Cl. 18		N/A
19.11	Handles, levers, knobs, etc.:		N/A
	– insulating material		N/A
	– supplementary insulation covering		N/A
	– separated from shafts or fixing by supplementary insulation		N/A
19.12	Windings construction		P
19.12.1	Undue displacement in all types of transformers not allowed:		-
	– of input or output windings or turns thereof		P
	– of internal wiring or wires for external connection		P
	– of parts of windings or of internal wiring in case of rupture or loosening		P
19.12.2	Serrated tape:		-
	– distance through insulation according to table 13		N/A
	– one additional layer of serrated tape, and		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	– one additional layer without serration		N/A
	– in case of cheekless bobbins the end turns of each layer shall be prevented from being displaced		N/A
19.12.3 (A1)	Insulated windings wires providing basic, supplementary or reinforced insulation, meet the following requirements:		-
	<ul style="list-style-type: none"> Multi-layer extruded or spirally wrapped insulation, passed the tests of annex K 		N/A
	<ul style="list-style-type: none"> Basic insulation: two wrapped or one extruded wire 		N/A
	<ul style="list-style-type: none"> Supplementary insulation: two layers, wrapped or extruded 		N/A
	<ul style="list-style-type: none"> Reinforced insulation: three layers wrapped or extruded 		N/A
	Spirally wrapped insulation:		-
	<ul style="list-style-type: none"> creepage distances between wrapped layers > cl. 26 - P1 values 		N/A
	<ul style="list-style-type: none"> path between wrapped layers sealed, the test voltage of K2 is multiplied with 1,35 		N/A
	<ul style="list-style-type: none"> test 26.2.3 – Test A, passed for wrapped layers 		N/A
	<ul style="list-style-type: none"> the finished component pass the electric strength test according to cl. 18.3 		N/A
a)	Insulated winding wire used for basic or supplementary insulation in a wound part:		-
	<ul style="list-style-type: none"> comply with annex K 		N/A
	<ul style="list-style-type: none"> two layers for supplementary insulation 		N/A
	<ul style="list-style-type: none"> one layer for basic insulation 		N/A
	<ul style="list-style-type: none"> one layer for mechanical separation between the insulated wires of primary and secondary. This layer fulfils the requirement of basic insulation. 		N/A
b)	Insulated winding wire used for reinforced insulation in a wound part:	Approved TIW	-
	<ul style="list-style-type: none"> comply with annex K 		P
	<ul style="list-style-type: none"> three layers 		P
	<ul style="list-style-type: none"> relevant dielectric strength test of 18.3 		P
	Where the insulated winding wire is wound:		-
	<ul style="list-style-type: none"> upon metal or ferrite cores 		N/A
	<ul style="list-style-type: none"> upon enamelled wire 		P
	<ul style="list-style-type: none"> under enamelled wire 		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	<ul style="list-style-type: none"> one layer for mechanical separation between the insulated wires and the core or the enamelled wires is required. This layer fulfils the requirement of basic insulation. 		P
	<ul style="list-style-type: none"> both windings shall not touch each other and also not the core. 		P
	100 % routine test of Annex K3 of part 1 is fulfilled		P
	no creepage distances and clearances for insulated winding wirers		P
	for TIW wires values of box 2) c) of table 13, table C.1 and table D.1 of part 1 and of clause 26.106 are not required	TIW used	P
FIW	<u>Transformers which use FIW wire</u>		-
19.12.101 (A1)	Max. class F for transformers which use FIW-wire		N/A
19.12.102 (A1)	FIW wires comply with IEC 60851-5, Ed.4.1; IEC 60317-0-7 and IEC 60317-56, Ed.1.		N/A
	<ul style="list-style-type: none"> other nominal diameter as mentioned in table 19.101 can be calculated with the formula after table 19.111 		N/A
	FIW wire used for basic or supplementary insulation for transformers according 19.1.2 (separating-transformers) of IEC 61558-2-16:		-
	<ul style="list-style-type: none"> the test voltage of table 8a – part 1, based on the working voltage of basic or supplementary insulation, comply with the min. voltage strength of table 19.111 		N/A
	<ul style="list-style-type: none"> one layer for mechanical separation is located between the insulated wires of primary and secondary. This layer fulfil the requirement of basic insulation 		N/A
	<ul style="list-style-type: none"> between FIW and enamelled wire, no requirements of creepage distances and clearances 		N/A
	<ul style="list-style-type: none"> no touch of FIW and enamelled wires (grad 1, or grad 2 ...) 		N/A
	FIW wire used for double or reinforced insulation for transformers according 19.1.3 (isolating and safety isolating transformers) of IEC 61558-2-16 (PRI and SEC basic insulated FIW-wire):		N/A
	<ul style="list-style-type: none"> the test voltage of table 8a – part 1, based on the working voltage of basic or supplementary insulation, comply with the min. voltage strength of table 19.111 		N/A
	<ul style="list-style-type: none"> for primary and secondary winding FIW-wire for basic insulation is used 		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	<ul style="list-style-type: none"> one layer for mechanical separation is located between the insulated wires of primary and secondary. This layer fulfil the requirement of basic insulation 		N/A
	<ul style="list-style-type: none"> no touch between the basic insulated PRI and SEC FIW-wires 		N/A
	<ul style="list-style-type: none"> between PRI- and SEC-FIW wires, no requirements of creepage distances and clearances 		N/A
	Alternative construction used for reinforced insulation (reinforced insulated FIW wire and enamelled wire)		N/A
	<ul style="list-style-type: none"> the test voltage of table 8a – part 1, based on the working voltage reinforced insulation, comply with the min. voltage strength of table 19.111 		N/A
	<ul style="list-style-type: none"> one layer for mechanical separation is located between the reinforced insulated FIW wire and the enamelled wire. This layer fulfil the requirement of basic insulation 		N/A
	<ul style="list-style-type: none"> no touch between the FIW wire and the enamelled wire 		N/A
	<ul style="list-style-type: none"> between the reinforced FIW wire and any other parts, no requirements of creepage distances and clearances exist 		N/A
	Alternative construction with FIW wires, basic or supplementary insulated for transformers with double or reinforced insulation according to 19.1.3 (basic/supplementary insulated FIW wire + enamelled wire + creepage distance and clearances for basic insulation)		–
	<ul style="list-style-type: none"> the test voltage of table 8a – part 1, based on the working voltage of basic or supplementary insulation, comply with the min. voltage strength of table 19.111 		N/A
	<ul style="list-style-type: none"> PRI or SEC basic insulated FIW wire and to the other winding (enamelled wire) requirements of supplementary insulation 		N/A
	<ul style="list-style-type: none"> creepage distances and clearances between the basic insulated FIW wire and the enamelled wire for basic or supplementary insulation are required. 		N/A
	Where the FIW wire is wound		N/A
	<ul style="list-style-type: none"> upon metal or ferrite cores 		N/A
	<ul style="list-style-type: none"> one layer for mechanical separation between the insulated wires and the core or the enamelled wires is required. This layer fulfils the requirement of basic insulation. 		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	<ul style="list-style-type: none"> both windings shall not touch each other and also not the core. 		N/A
19.13	Handles, operating levers and the like shall be fixed		N/A
19.14	Protection against electric shock: covers securely fixed, 2 independent fixing means, one with tool		N/A
19.15	Transformer with pins for fixed socket-outlets: no strain on socket-outlet		P
	Additional torque $\leq 0,25$ Nm		P
19.16	Protection index for portable transformers:		-
	≤ 200 VA \geq IP20 and instructions for use	IP40	P
	> 200 VA $\leq 2,5$ kVA \geq IPX4 (single-phase)		N/A
	> 200 VA $\leq 6,3$ kVA \geq IPX4 (polyphase)		N/A
	$> 2,5$ VA (single-phase) \geq IP21		N/A
	$> 6,3$ VA (polyphase) \geq IP21		N/A
19.17	Transformers IPX1 - IPX6 totally enclosed, except for drain hole (diameter ≥ 5 mm or 20 mm ² with width ≥ 3 mm); drain hole not required for transformer completely filled with insulating materials		N/A
19.18	Transformers \geq IPX1 with a moulded, if any		N/A
19.19	Class I transformers with a non-detachable flexible cable or cord with earth conductor and a plug with earth contact		N/A
19.20	Live parts of SELV and PELV-circuits: separation not less than PRI/SEC of a safety isolating transformer		N/A
	– SELV output circuits separated by double or reinforced insulation from all other than SELV or PELV circuits		N/A
	– SELV output circuits separated by basic insulation from other SELV or PELV circuits		N/A
19.20.1	SELV circuits and parts not connected to protective earth, to live parts, or protective conductors forming part of other circuits		N/A
	Nominal voltage (V) > 25 V a.c. or 60 V d.c., the required insulation fulfils the high voltage test according to table 8 a		N/A
19.20.2	PELV-circuits double or reinforced insulation is necessary		P
19.21	FELV-circuits: protection against contact fulfils the min. test voltage required for the primary circuit		N/A
19.22	Class II transformers shall not be provided with means for protective earth		P

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Clause	Requirement + Test	Result - Remark	Verdict
	For fixed transformers an earth conductor with double or reinforced insulation to accessible metal parts is allowed		N/A
19.23	Class III transformers shall not be provided with means for protective earth		N/A

20	COMPONENTS		P
	Components such as switches, plugs, fuses, lamp holders, flexible cables and cords, comply with relevant IEC standard		P
	Components inside the transformer pass all tests of this standard together with the transformer tests		P
	Testing of components separately to the transformer according the relevant standard:		N/A
	– Ratings of the component in line with the transformer ratings, including inrush current. Component test according the component standard, based on the component marking (rating).		N/A
	– Components without markings tested under transformer conditions including inrush current.		N/A
	– If no IEC standard exists, the component is tested under transformer conditions.		N/A
20.1	Appliance couplers for main supply shall comply with:		-
	– IEC 60 320 for IPX0		P
	– IEC 60 309 for other		N/A
20.2	Automatic controls shall comply with IEC 60 730-1		N/A
20.3	Thermal-links comply with IEC 60691		N/A
20.4	Switches shall comply with annex F		N/A
	Disconnection from the supply:		-
	– by a switch, disconnecting all poles of the supply (full disconnection under the relevant over-voltage category		N/A
	– or a flexible supply cable and cord with plug		N/A
	– or an instruction sheet: disconnection by all-poles switches incorporated in fixed wiring		N/A
20.5	Socket-outlets of the output circuit shall be such that there is no unsafe compatibility to plugs complying with input circuit.		N/A
	Plugs and socket-outlets for SELV systems with both a rated current ≤ 3 A and a rated voltage ≤ 24 V shall comply with following:		N/A
	SELV plug and socket-outlets shall comply with IEC 60 884-2-4 and IEC 60 906-3		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	– It is not possible for plugs to enter socket-outlets of other standardised voltage system		N/A
	– Socket outlets do not accommodate plugs of other standardised voltage systems		N/A
	– Socket outlets do not have a protective earth contact		N/A
	PELV plug and socket-outlets shall comply with following:		-
	– It is not possible for plugs to enter socket-outlets of other standardised voltage system		N/A
	– Socket outlets do not accommodate plugs of other standardised voltage systems		N/A
	– Socket outlets do not have a protective earth contact		N/A
	FELV plug and socket-outlets shall comply with following:		N/A
	– It is not possible for plugs to enter socket-outlets of other standardised voltage system		N/A
	– Socket outlets do not accommodate plugs of other standardised voltage systems		N/A
20.6	Thermal cut-outs, overload releases etc. have adequate breaking capacity		N/A
	– Thermal cut outs fulfil the relevant requirements of 20.7 and 20.8		N/A
	– Thermal links fulfil the relevant requirements of 20.8		N/A
	– The breaking capacity is in accordance with the relevant fuse standard		N/A
20.6.1	For Fuses According IEC 60127 and IEC 60269, the fuse current does not exceed 1,1 times of the rated value		P
20.7	Thermal cut outs shall meet the requirements of 20.7.1.1 and 20.7.2, or 20.7.1.2 and 20.7.2.		N/A
20.7.1	Requirements according to IEC 60730-1		N/A
20.7.1.1	Thermal cut-out tested as component shall comply with IEC 60 730-1		N/A
20.7.1.2	Thermal cut-out tested as a part of the transformer		N/A
	a) Thermal cut outs type 1 or type 2 (IEC 60730-1)		N/A
	b) Thermal cut outs fulfil the requirements of micro-interruption (type 1C or 2 C) or micro-disconnection, (type 1B or 2B) (see IEC 60730-1)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	c) Thermal cut outs with manual reset have a trip free mechanism (type 1E and 2E) (see IEC 60730-1)		N/A
	d) The number of cycles of automatic action shall be:		N/A
	– 3000 cycles for self-resetting thermal cut-outs		N/A
	– 300 cycles for non-self-resetting thermal cut-outs resetting by hand		N/A
	– 300 cycles for non-self-resetting thermal cut-outs resetting disconnecting		N/A
	– 30 cycles for non-self-resetting thermal cut-outs which are only resettable by a tool		N/A
	e) Thermal cut outs fulfil the electrical stress according IEC 60730-1, 6.14.2		N/A
	f) Characteristic of thermal cut-outs:		N/A
	– ratings according IEC 60730-1, cl. 5		N/A
	– classification according to:		-
	1) nature of supply to IEC 60730-1, cl. 6.1		N/A
	2) type of load controlled to IEC 60730-1, cl. 6.2		N/A
	3) degree of protection IPX0 to IEC 60730-1, cl. 6.5.1		N/A
	4) degree of protection IP0X to IEC 60730-1, cl. 6.5.2		N/A
	5) pollution degree to IEC 60730-1, cl. 6.5.3		N/A
	6) comparative tracking index to IEC 60730-1, cl. 6.13		N/A
	7) max. ambient temperature to IEC 60730-1, cl. 6.7		N/A
20.7.1.2	Thermal cut-out tested as a part of the transformer, test with 3 samples:		-
	– at least micro-interruption or micro-disconnection (IEC 60730-1)		N/A
	– 300 h aged at t_a (transformer) + 10°C		N/A
	– subjected to a number of cycles for automatic operating according 20.7.1.1		N/A
	During the test no sustaining arcing shall occur, during and after the test no damage at the thermal cut out and the transformer in the sense of this standard		N/A
20.7.2	Thermal cut-outs shall have adequate breaking capacity		-

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Clause	Requirement + Test	Result - Remark	Verdict
20.7.2.1	The output of the transformer with a non-self-resetting thermal cut out is short circuited at a supply voltage 1, 1 of rated supply voltage. After opening of the cut off, the supply voltage is switched of, until the transformer is cooling down.		N/A
	– 3 cycles at 25°C for transformers without $t_{a \min}$		N/A
	– 3 cycles at $t_{a \min}$ for transformers with $t_{a \min}$		N/A
	– after the 3 cycles short circuit of the output at 1,1 of rated supply voltage for 48 h.		N/A
	During the tests no sustaining arcing shall occur After the test: withstand the test of clause 18, show no damage in sense of this standard, and be operational.		N/A
20.7.2.2	The output of the transformer with a self-resetting thermal cut out is short circuited at a supply voltage 1, 1 of rated supply voltage.		N/A
	– 48 h at 25°C for transformers without $t_{a \min}$		N/A
	– 24 h at t_a and 24 h at $t_{a \min}$ for transformers with $t_{a \min}$		N/A
	During the tests no sustaining arcing shall occur After the test: withstand the test of clause 18, show no damage in sense of this standard, and be operational.		N/A
20.7.3	Test of a PTC resistor:		-
	5 cycles: transformer short-circuited for 48 h by 1,1 times of the input voltage and max. t_a		N/A
	5 cycles: transformer short-circuited for 48 h by 0,9 times of the input voltage and min. t_a (if declared)		N/A
	After the test: withstand the test of clause 18, show no damage in sense of this standard, and be operational.		N/A
20.8	Thermal links shall be tested in one of the following two ways.		-
20.8.1	Thermal-links shall comply with IEC 60 691 as a separate component.		N/A
	– electrical conditions to IEC 60691, cl. 6.1		N/A
	– thermal conditions to IEC 60691, cl. 6.2		N/A
	– ratings to IEC 60691, cl. 8 b		N/A
	– suitability of sealing components, impregnating fluids or cleaning solvents IEC 60691, cl. 8 c		N/A
20.8.2	Thermal-links tested as a part of the transformer:		-
	– ageing test 300 h by 35°C or $t_a + 10^\circ\text{C}$		N/A
	– After transformer fault condition the thermal link operate without sustaining arcing		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	– after opening the thermal-link shall have an insulation resistance of at least 0,2 MΩ		N/A
	– 3 cycles for replaceable thermal-links		N/A
	– 3 new specimens for not replaceable thermal-links		N/A
20.9	Self-resetting devices not used if mechanical, electrical, etc. hazards		N/A
20.10	Thermal cut-outs which can be reset by soldering operation are not allowed		N/A
20.11	Overload protection devices do not operate during test (20 times switched on and off, at no load); Upri (V): 1,1 times rated supply voltage.		N/A

21	INTERNAL WIRING		P
21.1	Internal wiring and electrical connections protected or enclosed		P
	Wire-ways smooth and free from sharp edges		P
21.2	Openings in sheet metal: edges rounded (radius $\geq 1,5$ mm) or bushings of insulating material	Plastics enclosure	P
21.3	Bare conductors: distances adequately maintained	No bare conductors	N/A
21.4	When external wires are connected to terminal, internal wiring shall not work loose		N/A
21.5	Insulation of heat-resistant and non-hygroscopic material for insulated conductors subject to temperature rise > limiting values given in 14.1		P

22	SUPPLY CONNECTION AND EXTERNAL FLEXIBLE CABLES AND CORDS		P
22.1	All cables, flexible cords etc. shall have appropriate current and voltage ratings	Output lead with polarized low-voltage connector	P
22.2	Input and output wiring inlet and outlet openings for external wiring: separate entries without damage to protective covering of cable or cord		P
	Input and output wiring inlet and outlet openings for flexible cables or cords: insulating material or bushing of insulating material		P
	Bushings for external wiring: reliably fixed, not of rubber unless part of cord guard		P
22.3	Fixed transformer:		-
	– possible to connect after fixing		N/A
	– inside space for wires allow easy introduction and connection of conductors		N/A
	– fitting of cover without damage to conductors		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	– contact between insulation of external supply wires and live parts of different polarity not allowed		N/A
22.4	Length of power supply cord for portable transformers between 2 m and 4 m; without 0,5 mm ²		N/A
22.5	Power supply cords for transformers IPX0 and transformers "for indoor use only" ≥ IPX0:		N/A
	– for transformers with a mass ≤ 3 kg: 60227 IEC52 (H03VV-..) (60245 IEC 53)		N/A
	– for transformers with a mass > 3 kg: 60227 IEC53 (H05VV-..) or 60245 IEC 53		-
	Power supply cords for transformers for outdoor use: ≥ IPX0: 60245 IEC57 (H05RN-..)		N/A
22.6	Power supply cords for single-phase portable transformers with input current ≤ 16A:		-
	– cord set fitted with an appliance coupler in accordance with IEC 60320		N/A
22.7	Nominal cross-sectional area (mm ²); input current (A) at rated output not less than shown in table 9		N/A
22.8	Class I transformer with power supply flexible cable: green/yellow core connected to earth terminal	Class II	N/A
	Plug for single-phase transformer with input current at rated output ≤ 16 A according to IEC 60 083, IEC 60 906-1 or IEC 60 309	Direct plug-in equipment	P
22.9	Type X, Y or Z attachments: see relevant part 2		N/A
22.9.1	For type Z attachment: moulding enclosure and power supply cable do not affect insulation of cable		N/A
22.9.2	Inlet openings or inlet bushing: without risk of damage to protective covering of power supply cord	Bushing of output cord	P
	Insulation between conductor and enclosure:		P
	– for Class I transformer: insulation of conductor plus separate basic insulation		N/A
	– for Class II transformer: insulation of conductor plus double or reinforced insulation	Enclosure of insulating material	P
22.9.3	Inlet bushings:		-
	– no damage to power supply cord		N/A
	– reliably fixed		N/A
	– not removable without tool		N/A
	– not integral with power supply cord (for type X attachment)		N/A
	– not of natural rubber except for Class I transformer with type X, Y and Z attachments		N/A
22.9.4	For portable transformers which are moved while operating:		-

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Clause	Requirement + Test	Result - Remark	Verdict
	– cord guards, if any, of insulating material and fixed		N/A
	Compliance is tested by the oscillating test according to fig. 7:		-
	– loaded force during the test according to fig. 7		N/A
	– 10 N for a cross-sectional area > 0,75		N/A
	– 5 N for a cross-sectional area ≤ 0,75		N/A
	After the test according to fig. 7:		-
	– no short-circuit between the conductors		N/A
	– no breakage of more than 10% of stands of any conductor		N/A
	– no separation of the conductor from the terminal		N/A
	– no loosening of any cord guards		N/A
	– no damage of the cord or cord guard		N/A
	– no broken strands piercing the insulation and not becoming accessible		N/A
22.9.5	Cord anchorages for type X attachment:		-
	– glands in portable transformers not used unless possibility for clamping all types and sizes of cable		N/A
	– moulded-on designs, tying the cable into a knot and tying the end with string not allowed		N/A
	– labyrinths, if clearly how, permitted		N/A
	– replacement of cable easily possible		N/A
	– protection against strain and twisting clearly how		N/A
	– suitable for different types of cable unless only one type of cable for transformer		N/A
	– the entire flexible cable or cord with covering can be mounted into the cord anchorage		N/A
	– if tightened or loosened no damage		N/A
	– no contact between cable or cord and accessible or electrically connected clamping screws		N/A
	– cord clamped by metal screw not allowed		N/A
	– one part securely fixed to transformer		N/A
	– for Class I transformer: insulating material or insulated from metal parts		N/A
	– for Class II transformers: insulating material or supplementary insulation from metal parts		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Cord anchorages for type X, Y, Z attachments: cores of power external flexible cable or cord insulated from accessible metal parts by:		N/A
	– basic insulation (Class I transformers), separate insulating barrier/cord anchorage		N/A
	– supplementary insulation (Class II transformers), special lining/cable or cord sheath of cable sheath of cable		N/A
	Cord anchorages for type X and Y attachments:		-
	– replacement of external flexible cable or cord does not impair compliance with standard		N/A
	– the entire flexible cable or cord with covering can be mounted into the cord anchorage		N/A
	– if tightened or loosened no damage		N/A
	– no contact between cable or cord and accessible or electrically connected clamping screws		N/A
	– cord clamped by metal screws not allowed		N/A
	– knots in cord not used		N/A
	– labyrinths, if clearly how, permitted		N/A
	Tests for type X with special cords, type Y, type Z		P
	Test for type X attachments one test with a cord with smallest and one test with a cord with the largest cross-sectional area:		N/A
	– for the test with clamping screws or tightened with torque 2/3 of that specified in table 11		N/A
	– not possible to push cable into transformer		P
	– 25 pulls of 1 s		P
	– 1 min torque according to table 10		P
	– mass (kg); pull (N); torque (Nm): < 1 kg; 30 N; 0,1 Nm		—
	– during test: cable not damaged		P
	– after test: longitudinal displacement ≤ 2 mm for cable or cord and ≤ 1 mm for conductors in terminals		P
	– creepage distances and clearances \geq values specified in Cl. 26		N/A
22.9.6	Space for external cords or cable for fixed wiring and for type X and Y attachments:		N/A
	– before fitting cover, possibility to check correct connection and position of conductors		N/A
	– cover fitted without damage to supply cords		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	– for portable transformers: contact with accessible metal parts if conductor becomes loose not allowed unless for type X and Y attachments terminations of cords do not slip free of conductor		N/A
	Space for external cords or cable for type X attachment and for connection to fixed wiring, in addition:		N/A
	– conductor easily introduced and connected		N/A
	– possibility of access to terminal for external conductor after removal of covers without special purpose tool		N/A

23	TERMINALS FOR EXTERNAL CONDUCTORS		N/A
23.1	Transformer for connection to fixed wiring and transformer without power supply cords with type Y and Z attachments: only connections by screws, nuts, terminals		N/A
	Terminals are integral part of the transformer:		-
	– comply with IEC 60 999-1 under transformer conditions		N/A
	Other terminals:		-
	– separately checked according to IEC 60 998-2-1, IEC 60 998-2-2 or IEC 60 947-7-1		N/A
	– used in accordance with their marking		N/A
	– checked according to IEC 60 999-1 under transformer conditions		N/A
	Transformer with type X attachments: soldered connection permitted if reliance not placed upon soldering, crimping or welding alone unless by barriers, creepage distances and clearances between hazardous live parts and metal parts should conductor break away $\geq 50\%$ of specified value (Cl. 26)		N/A
	Transformer with type Y and Z attachments for external conductors: soldered, welded, crimped, etc. connections allowed		N/A
	For Class II transformer: reliance not placed upon soldering, crimping or welding alone unless by barriers, creepage distances and clearances between hazardous live parts and metal parts should conductor break away $\geq 50\%$ of specified value (Cl. 26)		N/A
23.2	Terminals for type X with special cords Y and Z attachments shall be suitable for their purpose:		-
	– test by inspection according to 23.1 and 23.2		N/A
	– pull of 5 N to the connection before test according to 14.1		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
23.3	Other terminals than Y and Z attachments shall be so fixed that when the clamping means is tightened or loosened:		-
	– terminal does not work loose		N/A
	– internal wiring is not subjected to stress		N/A
	– creepage distances and clearance are not reduced below the values specified in Cl. 26		N/A
23.4	Other terminals than Y and Z attachments shall be so designed that:		-
	– they clamp the conductor between metallic surfaces with sufficient contact pressure		N/A
	– without damage to the conductor		N/A
	– test by inspection according to 23.3 and 23.4		N/A
	– 10 times fastening and loosening a conductor with the largest cross-sectional area with 2/3 of the torque specified in Cl. 25		N/A
23.5	Terminals for fixed wiring and for type X: located near their associated terminals of different polarities and the earth terminal if any		N/A
23.6	Terminal blocks not accessible without the aid of a tool		N/A
23.7	Transformer with type X attachments: stranded conductor test (8 mm removed):		-
	– Class I transformers: no connection between live parts and accessible metal parts		N/A
	– free wire of earth terminal: no touching of live parts		N/A
	– Class II transformers: no connection between live parts and accessible metal parts, no connection between live parts and metal parts separated from accessible metal parts by supplementary insulation		N/A
23.8	Terminals for a current > 25 A:		-
	– pressure plate, or		N/A
	– two clamping screws		N/A
23.9	When terminal, other than protective earth conductor, screws loosened as far as possible, no contact:		-
	– between terminal screws and accessible metal parts		N/A
	– between terminal screws and inaccessible metal parts for Class II transformers		N/A
24	PROVISION FOR PROTECTIVE EARTHING		P

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Clause	Requirement + Test	Result - Remark	Verdict
24.1	Class I transformers: accessible conductive parts connected to earth terminal	Functional earth	P
	Class II transformers: no provision for earth		P
24.2	Protective earth terminal for connection to fixed wiring and for type X attachment transformers: comply with Cl. 23, adequately locked, not possible to loosen without a tool		N/A
24.3	No risk of corrosion from contact between metal of earth terminal and other terminal		N/A
	In case of earth terminal body of Al, no risk of corrosion from contact between Cu and Al		N/A
	Body of earth terminal or screws/nuts of brass or other metal resistant to corrosion		N/A
24.4	Resistance of connection between earth terminal and metal parts $\leq 0,1 \Omega$ with a min. 25 A or 1,5 rated input current at 1 min		N/A
24.5	Class I transformers with external flexible cables or cords:		-
	– current-carrying conductors becoming touch before the earth conductor		N/A

25	SCREWS AND CONNECTIONS		N/A
25.1	Screwed connections withstand mechanical stresses	No screwed connections	N/A
	Screws transmitting contact pressure or likely to be tightened by the user or having a diameter < 2,8 mm, shall screw into metal		N/A
	Screws not of metal which is soft or liable to creep (Zn, Al)		N/A
	Screws of insulating material: not used for electrical connection		N/A
	Screws not of insulating material if their replacement by metal screws can impair supplementary or reinforced insulation		N/A
	Screws to be removed (replacement etc. of power supply cord) not of insulating material if their replacement by metal screws can impair basic insulation		N/A
	No damage after torque test: diameter (mm); torque (Nm); ten times		N/A
	No damage after torque test: diameter (mm); torque (Nm); five times		N/A
25.2	Screws in engagement with thread of insulating material:		N/A
	– length of engagement $\geq 3 \text{ mm} + 1/2$ screw diameter or 8 mm		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	– correct introduction into screw hole		N/A
25.3	Electrical connections: contact pressure not transmitted through insulating material		N/A
25.4	In case of use of thread-forming (sheet metal) screws for connection of current-carrying parts: clamping and locking means provided		N/A
	Thread-cutting (self-tapping) screws used for the connection of current-carrying parts allowed if they generate a full form machine screw thread and if not operated by the user		N/A
	Thread-cutting screws and thread-forming screws used for earth continuity allowed if at least 2 screws for each connection are used and it is not necessary to disturb the connection in normal use		N/A
25.5	Screws for current-carrying mechanical connections locked against loosening		N/A
	Rivets for current-carrying connections subject to torsion locked against loosening		N/A
25.6	Test of screwed glands with a torque according table 12. After the test no damage at the transformer and the gland.		N/A

26	CREEPAGE DISTANCES AND CLEARANCES		P
26.1	See 26.101		P
26.2	Creepage distances (cr) and clearances (cr)		P
26.2.1	Windings covered with adhesive tape		N/A
	– the values of pollution degree 1 are fulfilled		N/A
	– all isolating material are classified acc. to IEC 60085 and IEC 60216		N/A
	– test A of 26.2.3 is fulfilled		N/A
26.2.2	Uncemented insulating parts pollution degree P2 or P3		P
	– all isolating material are classified acc. to IEC 60085 and IEC 60216		P
	– values of pollution degree 1 are not applicable		N/A
26.2.3	Cemented insulating parts		N/A
	– all isolating materials are classified acc. to IEC 60085 and IEC 60216		N/A
	– values of distance through insulation (dti) are fulfilled		N/A
	– creepage distances and clearances are not required		N/A
	– test A of this sub clause is fulfilled		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Test A		N/A
	– thermal class		N/A
	– working voltage		N/A
	– Test with three specially specimens, with un-insulated wires, without impregnation or potting	(see appended table)	N/A
	Two of the three specimens are subjected to:		N/A
	– the relevant humidity treatment according to 17.2 (48 h)		N/A
	– the relevant dielectric strength test of 18.3 multiplied with factor 1,35		N/A
	– One of the three specimens is subjected to the relevant dielectric strength test of 18.3 multiplied by the factor 1,35 immediately at the end of the last cycle with high temperature		N/A
	Impulse dielectric test according to 4.1.1.2.1 of IEC 60 664-1 (1,2 / 50 μ s waveform) – see Annex R of IEC 61558-1		N/A
26.2.4	Enclosed parts, by impregnation or potting		N/A
26.2.4.1	– The requirements of reduced values as stated for pollution degree 1 (P1) are fulfilled		N/A
	– all isolating materials are classified acc. to IEC 60085 and IEC 60216		N/A
	Test B		N/A
	– thermal class		N/A
	– working voltage		N/A
	– Test with three specially specimens, potted or impregnated. The dielectric strength test is applied directly to the joint.	(see appended table)	N/A
	Two of the three specimens are subjected to:		N/A
	– the relevant humidity treatment according to 17.2 (48 h)		N/A
	– the relevant dielectric strength test of 18.3 multiplied with factor 1,25		N/A
	– One of the three specimens is subjected to the relevant dielectric strength test of 18.3 multiplied by the factor 1,25 immediately at the end of the last cycle with high temperature		N/A
	The three spacemen pass the Impulse dielectric test according to 4.1.1.2.1 of IEC 60 664-1 (1,2 / 50 μ s waveform) – see Annex R of IEC 61558-1		N/A
26.2.4.2	– The requirements of distance through insulation (dti) are fulfilled. (P1 values are not required)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	– all isolating materials are classified acc. to IEC 60085 and IEC 60216		N/A
	Test C		N/A
	– thermal class		N/A
	– working voltage		N/A
	– Test with three specimens, potted or impregnated. (finished components)	(see appended table)	N/A
	– Neither cracks, nor voids in the insulating compounds		N/A
	Two of the three specimens are subjected to:		N/A
	– the relevant humidity treatment according to 17.2 (48 h)		N/A
	– the relevant dielectric strength test of 18.3 multiplied with factor 1,35		N/A
	– One of the three specimens is subjected to the relevant dielectric strength test of 18.3 multiplied by the factor 1,35 immediately at the end of the last cycle with high temperature		N/A
	The three spacemen pass the Impulse dielectric test according to 4.1.1.2.1 of IEC 60 664-1 (1,2 / 50 μ s waveform) – see Annex R of IEC 61558-1		N/A
26.3	Distance through insulation		P
	For double or reinforced insulation, the required values of Tables 13, C1, and D1 – boxes 2b, 2c and 7 are fulfilled		P
	The insulation fulfil the material classification according IEC 60085 or 60216 or the test of 14.3		P
26.3.1	Reduced values of the thickness of insulation for supplementary or reinforced insulation are allowed if the following conditions are fulfilled:		N/A
	– the isolating materials are classified acc. to IEC 60085 and IEC 60216		N/A
	– the test of 14.3 is fulfilled		N/A
	– If both requirements are fulfilled, the required values for solid insulation can be multiplied by 0,4		N/A
	– Minimum thickness of reinforced insulation $\geq 0,2$ mm		N/A
	– Minimum thickness of supplementary insulation $\geq 0,1$ mm		N/A
26.3.2	Insulation in thin sheet form		P
	– If the layers are non-separable (glued together):		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	– The requirement of 3 layers is fulfilled		N/A
	– The mandrel test according 26.3.3 is fulfilled with 150 N		N/A
	– The required values for d.t.i. of Tables 13, C.1 and D.1 – marked by index "e" is fulfilled.		N/A
	– If the layers are separated:		-
	– The requirement of 2 layers is fulfilled		N/A
	– If serrated tape is used, 1 additional layer (serrated) and one additional layer without serration is required		N/A
	– The mandrel test according 26.3.3 is fulfilled on each layer with 50 N		N/A
	– The required values for d.t.i. of Tables 13, C.1 and D.1 – marked by index "e" is fulfilled.		N/A
	– If the layers are separated (alternative):		N/A
	– The requirement of 3 layers is fulfilled		N/A
	– If serrated tape is used, 1 additional layer (serrated) and one additional layer without serration is required		N/A
	– The mandrel test according 26.3.3 is fulfilled on 2/3 of the layers with 100 N		N/A
	– The required values for d.t.i. of Tables 13, C.1 and D.1 – marked by index "e" is fulfilled.		N/A
	Test according to 14.3 and if the isolating materials are classified acc. to IEC 60085 and IEC 60216 no distances through insulation are required for insulation in thin sheet form		N/A
	The figures within square brackets in box 2 and 7 of table 13 (C.1/D.1) are used for insulation in thin sheet form as follows:		-
	– rated output > 100 VA values in square brackets apply		N/A
	– rated output $\geq 25 \text{ VA} \leq 100 \text{ VA}$ 2/3 of the value in square brackets apply		P
	– rated output $\leq 25 \text{ VA}$ 1/3 of the value in square brackets apply		P
26.3.3	Mandrel test of insulation in thin sheet form (specimen of 70 mm width are necessary):		N/A
	– If the layers are non-separable – at least 3 layers glued together fulfil the test:		N/A
	– pull force of 150 N		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	– high voltage test of 5,0 kV or the test voltage of 18.3 multiplied by 1,25 whatever is the greater. No flashover, no breakdown.		N/A
	– If the layers are separable and 2/3 of at least 3 layers fulfil the test.		N/A
	– pull force of 100 N		N/A
	– high voltage test of 5,0 kV or the test voltage of 18.3 multiplied by 1,25 whatever is the greater. No flashover, no breakdowns.		N/A
	– If the layers are separable 1 of at least 2 layers fulfil the test:		N/A
	– pull force of 50 N		N/A
	– high voltage test of 5,0 kV or the test voltage of 18.3 multiplied by 1,25 whatever is the greater. No flashover, no breakdown.		N/A
26.101	Creepage distances, clearances and distances through insulation, specified values according to (EN 61558-2-16:09):		P
	– table 13, material group IIIa (part 1)		P
	– table C, material group II (part 1)		N/A
	– table D, material group I (part 1)		N/A
	– working voltage	Max. 278 Vrms	P
	– rated supply frequency 50/60 Hz		P
	– rated internal frequency		N/A
	1. Insulation between input and output circuits (basic insulation):		N/A
	a) measured values \geq specified values (mm)		N/A
	2. Insulation between input and output circuits (double or reinforced insulation):	(see appended table)	P
	a) measured values \geq specified values (mm)		P
	b) measured values \geq specified values (mm)		N/A
	c) measured values \geq specified values (mm)		P
	3. Insulation between adjacent input circuits: measured values \geq specified values (mm):		N/A
	Insulation between adjacent output circuits: measured values \geq specified values (mm) ..:		N/A
	4. Insulation between terminals for external connection:		N/A
	a) measured values \geq specified values (mm)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	b) measured values \geq specified values (mm)		N/A
	c) measured values \geq specified values (mm)		N/A
	5. Basic or supplementary insulation:	(see appended table)	P
	a) measured values \geq specified values (mm)		P
	b) measured values \geq specified values (mm)		N/A
	c) measured values \geq specified values (mm)		N/A
	d) measured values \geq specified values (mm)		N/A
	e) measured values \geq specified values (mm)		N/A
	6. Reinforced or double insulation: measured values \geq specified values (mm)		N/A
	7. Distance through insulation:	(see appended table)	P
	a) measured values \geq specified values (mm)		P
	b) measured values \geq specified values (mm)		N/A
	c) measured values \geq specified values (mm)		N/A
26.102	Values of IEC 61558-2-16 applicable for frequency up to 3 MHz (EN 61558-2-16:09)		P
	For frequency above 3 MHz clause 7 of IEC 60664-4 is applicable (high frequency testing)		N/A
26.103	Clearance (EN 61558-2-16:09)		P
	a) Clearance for frequency \geq 30 kHz according figure 101 two determinations are necessary:		P
	– determination based on peak working voltage according Table 104:		P
	Peak working voltage	<600 V	P
	Basic insulation: required / measured		P
	Double or reinforced insulation: required / measured value		P
	– and alternative if applicable for approximately homogeneous field according to Table 102		N/A
	Peak working voltage		N/A
	Basic insulation: required / measured		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Double or reinforced insulation: required / measured value		N/A
	– determination based on measured r.m.s. working voltage according Tables 13, C1 and D1 (see clause 26.101)		P
	The minimum clearance is the greater of the two values.	See cl.26.101	P
	b) Clearance for frequency ≤ 30 kHz according figure 101 two determinations are necessary:		N/A
	– determination based on peak working voltage with recurring peak voltages according Table 103 :		N/A
	– determination based on measured r.m.s. working voltage according Tables 13, C1 and D1 (see clause 26.101)		N/A
	The minimum clearance is the greater of the two values.		N/A
26.104	The working voltages of Table 102, 103 and 104 are peak voltages including μ sec peaks EN 61558-2-16:09)		P
	The working voltage according to Table 13 of part 1 are r.m.s. voltages		P
26.105	Creepage distances		P
	Two determinations of creepage distances are necessary (see Figure 102)		-
	– determination based on measured peak working voltage according Tables 105 to 110		P
	Peak working voltage	< 600 V peak	P
	Pollution degree	P2	P
	Basic or supplementary insulation: required / measured	See cl.26.101	P
	Double or reinforced insulation: required / measured value	See cl.26.101	P
	– determination based on measured r.m.s. working voltage according Tables 13, C1 and D1 (see clause 26.101)		P
	If the values based on table 105 to 110 are lower than the relevant values in Tables 13, C.1 or D.1, the higher values shall be applicable		P
26.106	Distance through insulation (EN 61558-2-16:09)		P
	Instead of partial discharge with high frequency voltage the test of the distance and the calculation of the electric field is applicable under the following conditions:		P
	– the max. frequency is < 10 MHz		P

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Clause	Requirement + Test	Result - Remark	Verdict
	– the field strength approximately comply with Figure 103		P
	– no voids or gaps are present in between the solid insulation		P
	For thick layers $d_1 \geq 0,75$ the peak value of the field strength is ≤ 2 kV/mm		N/A
	For thin layers $d_2 \leq 30$ μm the peak value of the field strength is ≤ 10 kV/mm		N/A
	For $d_1 > d > d_2$ equation (1) is used for calculation the field strength		P
26.107 (A1)	For transformers with FIW wires the following test is required	TIW used	N/A
	<ul style="list-style-type: none"> 10 cycles are required 		N/A
	<ul style="list-style-type: none"> 68 h test at max heating temperature + 10°C or test at max. allowed winding temperature based on the insulation class (required in table 1) + 10°C 		N/A
	<ul style="list-style-type: none"> 1 h at 25° C 		N/A
	<ul style="list-style-type: none"> 2 h at 0° C 		N/A
	<ul style="list-style-type: none"> 1 h at 25° C – (next cycle start again with 68 h max winding temp + 10) 		N/A
	<ul style="list-style-type: none"> during the 10 cycles test 2 x working voltage is connected between PRI and SEC 		N/A
	<ul style="list-style-type: none"> after 10 cycle test 2 transformers are subjected to the 17.2 test for 48 h and direct after the 48 h the dielectric strength test of 18.3 (100 % test voltage) is done 		N/A
	<ul style="list-style-type: none"> after the 10 cycle test the third sample is tested at the end of the last cycle in the hot position with the dielectric strength test of 18.3 (100 % test voltage) 		N/A
	<ul style="list-style-type: none"> the partial discharge test according to 18.101 is done after the cycling test and after the high voltage test, if the peak working voltage is >750 V 		N/A

27	RESISTANCE TO HEAT, FIRE AND TRACKING		P
27.1	Resistance to heat		-
	All insulating parts are resistant to heat		P
	For parts of rubber, which passed the test of 19.9, no additional test is required.		N/A
	The tests are not required for cables and small connectors with a rated current ≤ 3 A, a rated voltage ≤ 24 V a.c. or 60 V d.c. and a power ≤ 72 W		N/A
27.1.1	External accessible parts		-

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Clause	Requirement + Test	Result - Remark	Verdict
	The Ball-pressure test -: diameter of impression ≤ 2 mm; heating cabinet temperature ($^{\circ}\text{C}$) at 70°C or the temperature T of 14.1 (T + 15) - is fulfilled.	Sabic: < 1,5 mm;	P
27.1.2	Internal parts		-
	For insulating material retaining current carrying parts in position , the ball-pressure test -: diameter of impression ≤ 2 mm; heating cabinet temperature ($^{\circ}\text{C}$) at 125°C or the temperature T of 14.1 (T + 15) - is fulfilled	Bobbin: < 1,5 mm	P
27.2	Resistance to abnormal heat under fault conditions		N/A
27.3	Resistance to fire		-
	All isolating parts of the transformer shall be resistant to ignition and spread of fire. The test according to IEC 60696-2-10 is required		-
27.3.1	External accessible parts (glow wire tests)		P
	– 650°C for enclosures	sabic	P
	– 650°C for parts retaining current carrying parts in position and terminals for external conductors Current $\leq 0,2$ A		N/A
	– 750°C for parts retaining current carrying parts in position and terminals for external conductors with fixed wiring. Current $> 0,2$ A		N/A
	– 850°C for parts retaining current carrying parts in position and terminals for external conductors with non-fixed wiring. Current $> 0,2$ A		N/A
27.3.2	Internal parts		P
	– 550°C for internal insulating material – not retaining current carrying parts in position		N/A
	– 650°C for coil formers (bobbins)		P
	– 650°C for parts retaining current carrying parts in position and terminals for external conductors. Current $\leq 0,2$ A		N/A
	– 750°C for parts retaining current carrying parts in position and terminals for external conductors with fixed wiring. Current $> 0,2$ A	Input connector	P
	– 850°C for parts retaining current carrying parts in position and terminals for external conductors with non-fixed wiring. Current $> 0,2$ A	Input connector	P
27.4	For IP other than IPX0:If insulating parts retaining current carrying parts in position and under P3 conditions, the material resistance to tracking is at least material of group IIIa		N/A
	Test (175 V): no flashover or breakdown before 50 drops		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
28	RESISTANCE TO RUSTING		P
	Ferrous parts protected against rusting		P

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Clause	Requirement + Test	Result - Remark	Verdict

E	ANNEX E , GLOW WIRE TEST		P
	The test is required according to IEC 60695-2-10 and IEC 60695-2-11 with the following additions:		-
E.1	Clause 6, "Severities" of IEC 6095-2-11, apply with the temperature stated in 27.3 of IEC 61558-1		P
E2	Clause 8, "Conditioning", of IEC 60695-2-11 apply, preconditioning is required		P
E3	Clause 10, "Test Procedure", of IEC 60695-2-11 apply, The tip of the glow wire is applied to the flat side of the surface.		P

F	ANNEX F, REQUIREMENTS FOR MANUALLY OPERATED SWITCHES WHICH ARE PARTS OF THE TRANSFORMER		N/A
F.2	Manually operated mechanical switches, tested as separate component, shall comply with IEC 61058 under the conditions of F2.		N/A
F.§	Manually operated mechanical switches tested as part of the transformer shall comply with the conditions specified under F.3		N/A

H	ANNEX H, ELECTRONIC CIRCUITS (IEC 61558-1)		P
H1	General notes on tests (addition to clause 5)		P
H.2	SHORT-CIRCUIT AND OVERLOAD PROTECTION (ADDITION TO CLAUSE 15)		P
H.2.1	Circuits designed and applied so that fault conditions do not render the appliance unsafe		P
	During and after each test:		-
	– temperatures do not exceed values specified in table 3 of Cl. 15.1		P
	– transformer complies with conditions specified in sub-clause 15.1		P
	If a conductor of a pcb becomes open circuited, the transformer is considered to have withstood the particular test, provided that all six conditions as specified are met		N/A
H.2.2	Fault conditions a) to f) of sub-clause H.2.3 are not tested if the following conditions are met:		P
	– electronic circuit is a low-power circuit as specified		P
	– safety of the appliance as specified does not rely on correct functioning of the electronic circuit		P
H.2.3	Fault conditions tested as specified when relevant:		-

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Clause	Requirement + Test	Result - Remark	Verdict
	a) short-circuit of creepage distances and clearances, if less than specified in Cl. 26		P
	b) open circuit at the terminals of any component		P
	c) short-circuit of capacitors, unless they comply with IEC 60 384-14		P
	d) short-circuit of any two terminals of an electronic component as specified		P
	e) any failure of an integrated circuit as specified		P
	f) low-power circuit: low-power points are connected to the supply source		N/A
	Cl. 15 is repeated with a simulated fault as indicated in a) to e), if the transformer incorporates an electronic circuit to ensure compliance with Cl. 15		N/A
	Fault condition e) is applied for encapsulated and similar components		N/A
	PTC's and NTC's are not short-circuited if they are used as specified		N/A
H.2.4	If for a fuse-link complying with IEC 60 127-3 rated fuse current I_1 is used, current I_2 is measured as specified:		N/A
	– if $I_2 < 2,1 \times I_1$ test of 15.8 is repeated with fuse-link short-circuited		N/A
	– if $I_2 > 2,75 \times I_1$, no other tests are necessary		N/A
	If $I_2 > 2,1 \times I_1$ and $I_2 < 2,75 \times I_1$ test of 15.8 is repeated as specified		N/A
	For fuses other than those complying with IEC 60 127-3, the test is carried out as specified 15.3.2 to 15.3.5		N/A


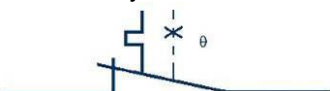
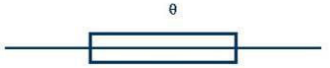

H.3	CREEPAGE DISTANCES, CLEARANCES AND DISTANCES THROUGH INSULATION		P
H.3.1	For live parts separated by basic insulation smaller cr and cl as in 26 are allowed, if H2 is fulfilled.		P
	In optocouplers no requirements of cr and cl		P
	For coatings annex W applies. Smaller distances as required in IEC 60664-3, clause 4 are applicable,		N/A
	For potted transformers cycling tests acc, 26.2. are applicable		N/A
H.3.2	The ma. surface temperature of optocouplers is 50 K	Approved optocoupler	P

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Clause	Requirement + Test	Result - Remark	Verdict
K (A1)	ANNEX K, INSULATED WINDING WIRES FOR USE AS MULTIPLE LAYER INSULATION		P
K.1	Wire construction:		-
	<ul style="list-style-type: none"> insulated winding wire for basic or supplementary insulation (see 19.12.3) 		N/A
	<ul style="list-style-type: none"> insulated winding wire for reinforced insulation (see 19.12.3) 		P
	<ul style="list-style-type: none"> solid circular winding wires and stranded winding wires with 0,05 to 5 mm diameter 		N/A
	<ul style="list-style-type: none"> spirally wrapped insulation - overlapping 		N/A
K.2	Type tests		N/A
K.2.1	General Tests between ambient temperature between 15° C and 35° C and at an humidity between 45% and 75 %		N/A
K.2.2	Electric strength test		N/A
K.2.2.1	Solid circular winding wires and stranded winding wires		N/A
	Test samples prepared according to clause 4.4.1 of IEC 60851-5:2008 (twisted pair)		N/A
	Dielectric strength test: 6 kV for reinforced insulation		N/A
	Dielectric strength test: 3 kV for basic or supplementary insulation		N/A
K.2.2.2	Square or rectangular wires.		N/A
	Test samples prepared according to clause 4.7.1 of IEC 60851-5:2008		N/A
	Dielectric strength test: 5,5 kV for reinforced insulation		N/A
	Dielectric strength test: 2,75 kV for basic or supplementary insulation		N/A
K.2.3	Flexibility and adherence		N/A
	Claus 5.1 in Test 8 of IEC 60851-3:2009 shall be used		N/A
	Test samples prepared according to clause 5.1.1.4 of IEC 60851-3:2009		N/A
	Dielectric strength test: 5,5 kV for reinforced insulation		N/A
	Dielectric strength test: 2,75 kV for basic or supplementary insulation		N/A
	Mandrel diameter according table K.1		N/A
	The tension to the wire during winding on mandrel is 118 N/mm ² (118 MPa)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
K.2.4	Heat shock		N/A
	Test samples prepared according to 3.1.1 (in Test 9) of IEC 60851-6:1996		N/A
	<ul style="list-style-type: none"> high voltage test immediately after this test 		N/A
	<ul style="list-style-type: none"> Dielectric strength test: 5,5 kV for reinforced insulation 		N/A
	<ul style="list-style-type: none"> Dielectric strength test: 2,75 kV for basic or supplementary insulation 		N/A
K.2.5	Retention of dielectric strength after bending (test as specified under test 13 of 4.6.1 c) of IEC 60 851-5)		N/A
	<ul style="list-style-type: none"> high voltage test immediately after this test 		N/A
	<ul style="list-style-type: none"> Dielectric strength test: 5,5 kV for reinforced insulation 		
	<ul style="list-style-type: none"> Dielectric strength test: 2,75 kV for basic or supplementary insulation 		
K.3.1	General Tests as subjected in K.3.2 and K.3.3		N/A
K.3.2	Routine test		N/A
	<ul style="list-style-type: none"> Dielectric strength test: 4,2 kV for reinforced insulation 		N/A
	<ul style="list-style-type: none"> Dielectric strength test: 2,1 kV for basic or supplementary insulation 		N/A
K.3.3	Sampling test		N/A
K.3.3.1	Solid circular winding wires and stranded winding wires		N/A
	Test with a twisted pair, prepared according clause 4.4.1 of IEC 60851-5:2008		N/A
	<ul style="list-style-type: none"> Dielectric strength test: 6 kV for reinforced insulation 		N/A
	<ul style="list-style-type: none"> Dielectric strength test: 3 kV for basic or supplementary insulation 		N/A
K.3.3.2	Square rectangular wire		N/A
	Samples prepared according to clause 4.7.1 of IEC 60851-5:2008		N/A
	<ul style="list-style-type: none"> Dielectric strength test: 5,5 kV for reinforced insulation 		N/A
	<ul style="list-style-type: none"> Dielectric strength test: 3 kV for basic or supplementary insulation 		N/A
U	ANNEX U – INFORMATIVE – OPTIONAL TW – MARKING FOR TRANSFORMERS		N/A

IEC 61558-1			
Clause	Requirement + Test	Result - Remark	Verdict
	The tests of Annex U are based on constant S = 4500. Other constants are possible, if the test of U.5.2 is done with positive result.		N/A
U1	General notes and tests		N/A
	8 transformers of one type are necessary for the test. Tests according U5.		N/A
U.2	Heating (addition to clause 14)		N/A
14.4	Thermal endurance test		N/A
	Test according U5 and measurements according 11.1		N/A
	Transformers tested as an integral part of the equipment (option), assigned with tw		N/A
	The thermal conditions are so adjusted, that the duration of test is as indicated by the manufacturer.		N/A
	If no indications are given, the test period is 30 days		N/A
	After the test, when the transformers have returned to room temperature, they fulfil the following requirements:		N/A
	a) The output voltage has not changed from the measured value at the beginning by more than allowed value of clause 11.1		N/A
	b) The insulation resistance between input and output winding and between windings and body is, measured with 500 V d.c. , not less than 1 MOhm		N/A
	c) The transformer fulfil the dielectric strength test with 35% of the values in Clause 18, Table 8.a.		N/A
	The test result is positive, is min. 6 of the 7 samples have passed the test.		N/A
	The test result is negative, if 2 or more samples fail the test		N/A
	If the result is negative, the test can be repeated with 7 new samples		N/A
U.3	Short circuit and overload protection (addition to clause 15)		N/A
	At short circuit and overload tests the winding temperature if less than the required value of table U.1		N/A
U.5	General requirements and information about thermal endurance test on windings		N/A
U.5.1	Thermal endurance test		N/A
	Transformers tested at rated output		N/A
	Loads outside of the oven		N/A
	7 transformers are placed in the oven		N/A

IEC 61558-1			
Clause	Requirement + Test	Result - Remark	Verdict
	The temperature of the hottest winding of each of the 7 transformers is-together with the oven temperature, at the applicable temperature of table U.2		N/A
	After 4 hours measuring of the actual winding temperatures. Regulation of the oven temperature if necessary		N/A
	After 24 hours again measuring of the winding temperature. The temperatures of the 7 samples are very near to the required temperature of the values of table U.2. The test time of the coldest winding is not longer than twice the theoretical test time based on table U.2		N/A
U.5.2	The use of constant S other than 4500 in tw tests		-
U.5.2.1	Procedure a)		N/A
	The manufacturer prepares test results with a minimum of samples of 30.		N/A
	T and log L are calculated from the dates		N/A
	The diagram according to Figure U.2 will be founded.		N/A
U.5.2.3	Procedure b)		N/A
	The testing authority shall test 14 new transformers		N/A
	Test 1, based on clause U.5.1 but at the calculated test room temperature for 10 days. The test is continued until all transformer fail.		N/A
	Calculation of the mean life L_2 at temperature T_2 according to U4		N/A
	Test 2, based on clause U.5.1 but at a calculated room temperature T_2 (for 120 days).The test time with T_2 exceeds L_2 .		N/A
	If all transformers fail before L_2 , the result is negative.		N/A

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
V	ANNEX V, SYMBOLS TO BE USED FOR THERMAL CUT-OUTS		N/A
V.2.1.1	Restored by manual operation  IEC 489/98		N/A
V.2.1.2	Restored by disconnection of the supply  IEC 490/98		N/A
V.2.1.3	Thermal link  IEC 491/98		N/A
V.2.2	Self-resetting thermal cut-out  IEC 492/98		N/A

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict

11 and 12	TABLE: OUTPUT VOLTAGE AND OUTPUT CURRENT UNDER LOAD; NO-LOAD OUTPUT VOLTAGE					P
Clause	11			12		
type/rated output/	rated voltage (V)	sec. voltage (V)	delta Usec (%)	Usec V no-load output	delta Usec no-load output %	further information
GTM91120-3007.5-2.5-T3A; 5 V d.c.; 4 A	5,0	4,877	-2,5	5,238	7,4	At input of 100 V, 50 Hz
GTM91120-3007.5-2.5-T3A; 5 V d.c.; 4 A	5,0	4,876	-2,5	5,238	7,4	At input of 100 V, 60 Hz
GTM91120-3007.5-2.5-T3A; 5 V d.c.; 4 A	5,5	4,874	-2,5	5,234	7,4	At input of 120 V, 50 Hz
GTM91120-3007.5-2.5-T3A; 5 V d.c.; 4 A	5,5	4,875	-2,5	5,236	7,4	At input of 120 V, 60 Hz
GTM91120-3007.5-2.5-T3A; 5 V d.c.; 4 A	5,5	4,874	-2,5	5,234	7,4	At input of 240 V, 50 Hz
GTM91120-3007.5-2.5-T3A; 5 V d.c.; 4 A	5,5	4,874	-2,5	5,234	7,4	At input of 240 V, 60 Hz
GTM91120-3048-T2; 48Vd.c.;0,625 A	48	47,63	-0,8	48,41	1,6	At input of 100 V, 50 Hz
GTM91120-3048-T2; 48Vd.c.;0,625 A	48	47,63	-0,8	48,41	1,6	At input of 100 V, 60 Hz
GTM91120-3048-T2; 48Vd.c.;0,625 A	48	47,52	-1,0	48,41	1,9	At input of 120 V, 50 Hz
GTM91120-3048-T2; 48Vd.c.;0,625 A	48	47,51	-1,0	48,36	1,8	At input of 120 V, 60 Hz
GTM91120-3048-T2; 48Vd.c.;0,625 A	48	47,39	-1,3	48,41	2,2	At input of 240 V, 50 Hz
GTM91120-3048-T2; 48Vd.c.;0,625 A	48	47,43	-1,2	48,41	2,1	At input of 240 V, 60 Hz
Supplementary information:						

14 B		TABLE: HEATING						P
type/rated output	r-cold Ω	r-warm Ω	temp. $^{\circ}\text{C}$	ext. encl. $^{\circ}\text{C}$	support $^{\circ}\text{C}$	int. + ext. wire	further information	
		Measured ($^{\circ}\text{C}$)			Max. allowed temperatures ($^{\circ}\text{C}$)			
Input voltage:		90 V	264 V					
1) Transformer T1 winding		107	95	110*				
2) Transformer T1 core		100	89	110				
3) Capacitor C2		100	78	105				
4) Optocoupler U2		94	83	100				
5) Capacitor CY1		85	77	125				
6) PCB near Q1		92	84	130				
7) Inductor LF2		68	65	130				
8) Capacitor CX1		81	63	100				
9) Inductor LF1 winding		114	73	130				
10) PCB near R11		106	79	130				
11) Enclosure outside top		67	61	80				
Supplementary information: GTM91120 Series Desktop 48 V d.c.; 0,625 A. Maximum ambient temperature was 40 $^{\circ}\text{C}$. The printed circuit board is rated 130 $^{\circ}\text{C}$. The temperature test was running until thermal stabilization was reached. Electric strength test was performed and passed after this test. * Temperature rises of the transformer was measured with the thermocouples (Class B transformer provided inside the unit, 120 $^{\circ}\text{C}$ - 10 $^{\circ}\text{C}$ = 110 $^{\circ}\text{C}$). Transformer is provided with secondary triple insulated wire.								

14 C		TABLE: HEATING						P
type/rated output	r-cold Ω	r-warm Ω	temp. $^{\circ}\text{C}$	ext. encl. $^{\circ}\text{C}$	support $^{\circ}\text{C}$	int. + ext. wire	further information	
		Measured ($^{\circ}\text{C}$)			Max. allowed temperatures ($^{\circ}\text{C}$)			
Input voltage:		90 V	264 V					
1) Transformer T1 winding		66	73	110*				
2) Transformer T1 core		66	73	110				
3) Capacitor C2		62	65	105				
4) Optocoupler U2		64	70	100				
5) Capacitor CY1		53	57	125				
6) PCB near Q1		65	72	130				
7) Inductor LF2		54	57	130				
8) Capacitor CX1		52	53	100				
9) Inductor LF1 winding		63	59	130				
10) PCB near R11		64	65	130				
11) Enclosure outside top		51	54	80				
Supplementary information: GTM91128LI3CEL 12,6 V d.c.; 1 A. Maximum ambient temperature was 40 $^{\circ}\text{C}$. The printed circuit board is rated 130 $^{\circ}\text{C}$. The temperature test was running until thermal stabilization was reached. Electric strength test was performed and passed after this test. * Temperature rises of the transformer was measured with the thermocouples (Class B transformer provided inside the unit, 120 $^{\circ}\text{C}$ - 10 $^{\circ}\text{C}$ = 110 $^{\circ}\text{C}$). Transformer is provided with secondary triple insulated wire.								

14 D	TABLE: HEATING						P
type/rated output	r-cold Ω	r-warm Ω	temp. °C	ext. encl. °C	support °C	int. + ext. wire	further information
	Measured (°C)			Max. allowed temperatures (°C)			
Input voltage:	90 V	264 V					
Transformer T1 winding	75	76					110*
Transformer T1 core	74	75					110
Diode D7 on PCB	79	79					130
Diode D4 on PCB	79	67					130
Fuse F1	59	55					125
Capacitor C2	74	70					105
Optocoupler U2	75	74					100
Capacitor CY1	70	70					125
PCB near Q1	77	74					130
Transistor Q1	77	75					130
Inductor LF2	65	66					120
Capacitor CX1	61	56					100
Fuse F2	59	54					125
Inductor LF1 winding	75	63					120
PCB near R11	77	69					130
Enclosure inside near label	72	70					80
Enclosure outside top	64	62					80
<p>Supplementary information: GTM91120 Series Potted 19 V d.c.; 1,58 A. Maximum ambient temperature was 40°C. The printed circuit board is rated 130°C. The temperature test was running until thermal stabilization was reached. Electric strength test was performed and passed after this test.</p> <p>* Temperature rises of the transformer was measured with the thermocouples (Class B transformer provided inside the unit, 120°C - 10°C = 110°C). Transformer is provided with secondary triple insulated wire.</p>							

14 E	TABLE: HEATING							P
type/rated output	r-cold Ω	r-warm Ω	temp. $^{\circ}\text{C}$	ext. encl. $^{\circ}\text{C}$	support $^{\circ}\text{C}$	int. + ext. wire	further information	
	Measured ($^{\circ}\text{C}$)			Max. allowed temperatures ($^{\circ}\text{C}$)				
Input voltage:	90 V	264 V						
Transformer T1 winding	84	87					110*	
Transformer T1 core	81	84					110	
Diode D7 on PCB	96	96					130	
Diode D4 on PCB	84	68					130	
Fuse F1	56	52					125	
Capacitor C2	75	72					105	
Optocoupler U2	75	76					100	
Capacitor CY1	65	66					125	
PCB near Q1	85	87					130	
Transistor Q1	86	90					130	
Inductor LF2	87	86					120	
Capacitor CX1	61	56					100	
Fuse F2	51	48					125	
Inductor LF1 winding	79	62					120	
PCB near R11	82	74					130	
Capacitor C11	75	74					105	
<p>Supplementary information: GTM91120 Series Open Frame 5 V d.c.; 4 A. Maximum ambient temperature was 40°C. The printed circuit board is rated 130°C. The temperature test was running until thermal stabilization was reached. Electric strength test was performed and passed after this test.</p> <p>* Temperature rises of the transformer was measured with the thermocouples (Class B transformer provided inside the unit, $120^{\circ}\text{C} - 10^{\circ}\text{C} = 110^{\circ}\text{C}$). Transformer is provided with secondary triple insulated wire.</p>								

14 F	TABLE: HEATING							P
type/rated output	r-cold Ω	r-warm Ω	temp. °C	ext. encl. °C	support °C	int. + ext. wire	further information	
	Measured (°C)			Max. allowed temperatures (°C)				
Input voltage:	90 V	264 V						
Transformer T1 winding	93	96					110*	
Transformer T1 core	83	89					110	
Diode D7 on PCB	91	93					130	
Diode D4 on PCB	91	70					130	
Fuse F1	60	52					125	
Capacitor C2	77	70					105	
Optocoupler U2	75	77					100	
Capacitor CY1	63	65					125	
PCB near Q1	91	88					130	
Transistor Q1	93	93					130	
Inductor LF2	52	54					120	
Capacitor CX1	62	55					100	
Fuse F2	53	49					125	
Inductor LF1 winding	91	65					120	
PCB near R11	88	76					130	
Capacitor C11	65	67					105	
<p>Supplementary information: GTM91120 Series Open Frame 48 V d.c.; 0,625 A. Maximum ambient temperature was 40°C. The printed circuit board is rated 130°C. The temperature test was running until thermal stabilization was reached. Electric strength test was performed and passed after this test.</p> <p>* Temperature rises of the transformer was measured with the thermocouples (Class B transformer provided inside the unit, 120°C - 10°C = 110°C). Transformer is provided with secondary triple insulated wire.</p>								

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict

15	TABLE: SHORT-CIRCUIT AND OVERLOAD PROTECTION						N/A
ambient temperature (°C)							
type/rated output	r-cold Ω	r-warm Ω	temp. °C	ext. encl. °C	support °C	int. + ext. wire	further information

Annex H.2	TABLE: Short circuit and overload protection (addition to Clause 15)					P
Component No.	Fault	Supply voltage (V)	Test time	Fuse #	Fuse current (A)	Observation
Diode D7 GTM91128 LI3CEL	Short	264	< 1 s (10 min)	F1/F2	0,05	Output switched off immediately. No defect. No hazard. Same result with and without load.
Diode D7 GTM91120- 3048-AB	Short	264	< 1 s (10 min)	F1/F2	0,05	Output switched off immediately. No defect. No hazard. Same result with and without load.
Optocoupler IC1 Pin 1 to pin 2 GTM91120- 3048-AB	Short	264	< 1 s (10 min)	F1/F2	0,05	Output switched off immediately. No defect. No hazard. Same result with and without load.
Optocoupler IC1 Pin 3 to pin 4 GTM91120- 3048-AB	Short	264	< 1 s (10 min)	F1/F2	0,05	Output switched off immediately. No defect. No hazard. Same result with and without load.
functional insulation short-circuited:						
Capacitor CX1	Short	264	< 1 s	F1/F2	> 6,6	Fuse F1/F2 opened immediately. No hazard.
Capacitor C2	Short	264	< 1 s	F1/F2	> 6,6	Fuse F1/F2 opened immediately. No hazard.
Additional component faults						
Transformer T1 Pin 1 to pin 2 GTM91120- 3014.5-2.5- AB	Short	264	< 1 s (10 min)	F1/F2	0,10	Output switched on/off. No defect. No hazard.
Transformer T1 Pin 3 to pin 5 GTM91120- 3014.5-2.5- AB	Short	264	< 1 s (10 min)	F1/F2	0,10	Output switched off immediately. No defect. No hazard.

Annex H.2 TABLE: Short circuit and overload protection (addition to Clause 15)						P
Component No.	Fault	Supply voltage (V)	Test time	Fuse #	Fuse current (A)	Observation
Transistor Q1 D – S GTM91120-3014.5-2.5-AB	Short	264	< 1 s (10 min)	F1/F2	> 6,6	Output switched off immediately. Fuse F1/F2 opened immediately. Unit damaged. No hazard.
Transformer overload						
Transformer T1 Pin TA to pin TB GTM91120-3007.5-2.5-AB	Short	264	< 1 s (10 min)	F1/F2	0,10	Output switched off immediately and was trying to switch on. No defect. No hazard. No excessive temperature rise.
Transformer T1 Pin TA to pin TB GTM91120-3048-AB	Short	264	< 1 s (10 min)	F1/F2	> 6,6	Output switched off immediately and was trying to switch on. After 5 min the fuse F1/F2 opened immediately. Unit damaged. No hazard. No excessive temperature rise.
Transformer T1 Pin TA to pin TB GTM91128 LI3CEL	Short	264	< 1 s (10 min)	F1/F2	0,10	Output switched off immediately and was trying to switch on. No defect. No hazard. No excessive temperature rise.
Transformer T1 Pin TA to pin TB	Overload	264	--	F1/F2	--	No secondary current limitation. Refer to output overload.
Misuse						
Output GTM91120-3014.5-2.5-AB	Short	264	< 1 s (10 min)	F1/F2	0,10	Output switched off immediately and was trying to switch on. No defect. No hazard. No excessive temperature rise.
Output GTM91120-3007.5-2.5-TB	Overload	264	120 min	F1/F2	0,29	Max. load: 4,8Vdc @ 4,5A. Max. measured temperature on T1 winding was 115,1°C @ 40°C ambient. No defect. No hazard.
Output GTM91120-3048-TB	Overload	264	120 min	F1/F2	0,39	Max. load: 48,0Vdc @ 0,8A. Max. measured temperature on T1 winding was 154,7°C @ 40°C ambient. Limit in Accordance with Annex C is 165°C. No defect. No hazard.
Output GTM91128 LI3CEL	Overload	264	120 min	F1/F2	0,33	Max. load: 13,0Vdc @ 2,4A. Max. measured temperature on T1 winding was 118,5°C @ 40°C ambient. No defect. No hazard.

Annex H.2 TABLE: Short circuit and overload protection (addition to Clause 15)						P
Component No.	Fault	Supply voltage (V)	Test time	Fuse #	Fuse current (A)	Observation
Supplementary information: There was no flame, extensive smoke or melted metal. When components were failing, the test was repeated two times. Test time: The time until the effect occurred was recorded. The value in bracket records the time, the failure was not removed.						

18.2	TABLE: Insulation Resistance Measurements		P
Insulation resistance R between:		R (MΩ)	Required R (MΩ)
Between mains poles (primary fuse disconnected)		> 10	2
Between parts separated by double or reinforced insulation		> 100	5
Supplementary information:			

18.3	TABLE: Dielectric Strength		P
Test voltage applied between:		Test potential applied (V)	Breakdown / flashover (Yes/No)
Between mains poles (primary R10 disconnected)		1997 V~	No
Between parts separated by double or reinforced insulation		3995 V~	No
Supplementary information:			

20	TABLE: Components					P
object/part No.	manufacturer/trademark	type/model	technical data	standard	mark(s) of conformity ¹⁾	
GTM91120-30VV-X.X-TB						
Enclosure (electrical, mechanical, fire)	+ SABIC Innovative Plastics	SE1X SE1 SE100 HF500R CX7211 EXCY0098 C2950	Rated min. V-1 at min. 2,0 mm thickness; RTI = 95°C Overall dimensions: 102 by 47 by 37 mm Top and bottom cover are ultrasonic welded.	IEC 61558-1 EN 61558-1 (QMFZ2)	Accepted UR E45329	
Enclosure (electrical, mechanical, fire) Alternative	+ Tejin Chemicals	LN-1250P LN-1250G	Rated min. V-1 at min. 2,0mm thickness; RTI = 125°C Overall dimensions: 102 by 47 by 37 mm Top and bottom cover are ultrasonic welded.	IEC 61558-1 EN 61558-1 (QMFZ2)	Accepted UR E50075	
Insulation foil between PCB bottom side and enclosure	+ SKC CO LTD	SH71S	Rated VTM-2 at min 0,076 mm thickness; RTI = 105°C OD: 91 by 40 mm; thickness 0,43 mm	IEC 61558-1 EN 61558-1 (QMFZ2)	Accepted UR E74359	

20	TABLE: Components					P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of con- formity ¹⁾	
PCB	+ Brite Plus Electronics (Suzhou)	DGV0-3A DKV0-3A	OD: 90 by 39 mm; thickness 1,6 mm Rated 94V-0; 130°C	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UR E177671	
PCB Alternative	Techni Tech- nology Ltd	T2A / T2B / T4	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E154355	
PCB Alternative	Dongguan He Tong Electron- ics Co Ltd	CEM1 / 2V0 / FR4	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E243157	
PCB Alternative	Cheerful Elec- tronic (Hk) Ltd	03 / 03A	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E199724	
PCB Alternative	Dongguan Daysun Elec- tronic Co Ltd	DS2	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E251754	
PCB Alternative	Suzhou City Yilihua Elec- tronics Co Ltd	YLH-1	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E251781	
PCB Alternative	Shanghai Arex Precision Elec- tronic Co Ltd	02V0 04V0	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E186016	
PCB Alternative	Kuotiang Ent Ltd	C-2 C-2A	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E227299	
PCB Alternative	Tongchuangxin Electronics Co Ltd	TCX	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E250336	
PCB Alternative	Pacific Win In- dustrial Ltd	PW-02 PW-03	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E228070	
Appliance inlet CON1 Class I units	+ Zhejiang LECI Electronics	DB-6	250 Vac; 2,5A; 3 pins	IEC/EN 60320-1 (AXUT2) (AXUT8)	VDE 40032465 cURus E302229	
Appliance inlet CON1 Class I units Alternative	+ Tecx-Unions Technology Corp	TU-333	250 Vac; 2,5A; 3 pins	IEC/EN 60320-1 (AXUT2)	VDE 40005430 UR E220004	
Appliance inlet CON1 Class I units Alternative	+ Rich Bay Co Ltd	R-30790	250 Vac; 2,5A; 3 pins	IEC/EN 60320-1 (AXUT2)	VDE 40030381 UR E184638	

20	TABLE: Components					P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of con- formity ¹⁾	
Appliance inlet CON1 Class I units Alternative	+ Sun Fair Electric Wire & Cable (HK) Co Ltd	S-02	250 Vac; 2,5A; 3 pins	IEC/EN 60320-1 (AXUT2) (AXUT8)	VDE 40034448 cURus E226643	
Appliance inlet CON1 Class I units Alternative	+ DLK Electronics Technology Co Ltd	CDJ-2	250 Vac; 2,5A; 3 pins	IEC/EN 60320-1 (AXUT2) (AXUT8)	VDE 40015580 cURus E217394	
Appliance inlet CON1 Class II units	+ Zhejiang LECI Electronics	DB-8	250 Vac; 2,5A; 2 pins	IEC/EN 60320-1 (AXUT2)	VDE 40032028 UR E302229	
Appliance inlet CON1 Class II units Alternative	+ Delikang Electronics Technology Co Ltd	CDJ-8	250 Vac; 2,5A; 2 pins	IEC/EN 60320-1 (AXUT2)	VDE 40025531 UR E217394	
Appliance inlet CON1 Class II units Alternative	+ Rich Bay Co Ltd	R-201SN90	250 Vac; 2,5A; 2 pins	IEC/EN 60320-1 (AXUT2)	VDE 40030384 UR E184638	
Appliance inlet CON1 Class II units Alternative	+ Sun Fair Electric Wire & Cable (HK) Co Ltd	S-01	250 Vac; 2,5A; 2 pins	IEC/EN 60320-1 (AXUT2)	VDE 40034449 UR E226643	
Appliance inlet CON1 Class II units Alternative	+ Tecx-unions Technology Corp	SO-222 series	250 Vac; 2,5A; 2 pins	IEC/EN 60320-1 (AXUT2)	VDE 40020337 UR E220004	
Thermal pad between sec. heatsink and transformer T1	+ Pioneer Ma- terial Precision Tech.	PMP-P-300	OD: 22 by 10 mm; thickness min. 0,4 mm Rated V-0; 150°C	IEC 61558-1 EN 61558-1 (QMFZ2)	Accepted UR E153203	
Functional ground wire Class I units	+ Kunshan New Zhicheng Elec- tronics Technologies Co Ltd	1015	Min.300V; 105°C; VW-1; 18AWG or better	IEC 61558-1 EN 61558-1 (AVLV2)	Accepted UR E237831	
Shrink tubing on functional ground wire Class I units	Woer Heat- Shrinkable Material	RSFR-H	Rated: Min. 300V; 125°C; VW-1	IEC 61558-1 EN 61558-1 (YDPU2)	Accepted UR E203950	
GTM91120-30VV-X.X-PB						
Enclosure cover	+ SABIC Innovative Plastics	SE1X SE1 SE100 HF500R CX7211 EXCY0098 C2950	Rated min. V-1 at min. 2,0 mm thickness; RTI = 95°C Overall dimensions: 97 by 45 by 32 mm	IEC 61558-1 EN 61558-1 (QMFZ2)	Accepted UR E45329	

20	TABLE: Components					P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of con- formity ¹⁾	
Potting material	+Dong Guan Shi Pai Hua Chuang Material FTY	808A/B	Rated V-0; 90°C	IEC 61558-1 EN 61558-1 (QMFZ2) (QMFZ8)	Accepted cURus E304477	
Potting material Alternative	+ SUZHOU POCHELY ELECTRONIC MATERIAL CO LTD	HB-5225A/B	Rated V-0; 90°C	IEC 61558-1 EN 61558-1 (QMFZ2)	Accepted UR E304947	
PCB	+ Brite Plus Electronics (Suzhou)	DGV0-3A DKV0-3A	OD: 90 by 39 mm; thickness 1,6 mm Rated 94V-0; 130°C	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UR E177671	
PCB Alternative	Techni Tech- nology Ltd	T2A / T2B / T4	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E154355	
PCB Alternative	Dongguan He Tong Electron- ics Co Ltd	CEM1 / 2V0 / FR4	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E243157	
PCB Alternative	Cheerful Elec- tronic (Hk) Ltd	03 / 03A	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E199724	
PCB Alternative	Dongguan Daysun Elec- tronic Co Ltd	DS2	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E251754	
PCB Alternative	Suzhou City Yilihua Elec- tronics Co Ltd	YLH-1	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E251781	
PCB Alternative	Shanghai Arex Precision Elec- tronic Co Ltd	02V0 04V0	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E186016	
PCB Alternative	Kuotiang Ent Ltd	C-2 C-2A	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E227299	
PCB Alternative	Tongchuangxin Electronics Co Ltd	TCX	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E250336	
PCB Alternative	Pacific Win In- dustrial Ltd	PW-02 PW-03	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E228070	

20	TABLE: Components					P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of con- formity ¹⁾	
Input connection wiring	+ Kunshan Zhicheng Electronic Technology	1015 or 2468	Min300V; 105°C; VW-1; 18AWG or better	IEC 61558-1 EN 61558-1 (AVLV2 or ZJCZ)	Accepted UR E237831	
GTM91120-30VV-X.X-FB						
PCB	+ Brite Plus Electronics (Suzhou)	DGV0-3A DKV0-3A	OD: 90 by 39 mm; thickness 1,6 mm Rated 94V-0; 130°C	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UR E177671	
PCB Alternative	Techni Technology Ltd	T2A / T2B / T4	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E154355	
PCB Alternative	Dongguan He Tong Electronics Co Ltd	CEM1 / 2V0 / FR4	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E243157	
PCB Alternative	Cheerful Electronic (Hk) Ltd	03 / 03A	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E199724	
PCB Alternative	Dongguan Daysun Electronic Co Ltd	DS2	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E251754	
PCB Alternative	Suzhou City Yilihua Electronics Co Ltd	YLH-1	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E251781	
PCB Alternative	Shanghai Arex Precision Electronic Co Ltd	02V0 04V0	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E186016	
PCB Alternative	Kuotiang Ent Ltd	C-2 C-2A	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E227299	
PCB Alternative	Tongchuangxin Electronics Co Ltd	TCX	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E250336	
PCB Alternative	Pacific Win Industrial Ltd	PW-02 PW-03	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E228070	
Input connector CON1	+ Neltron Industrial Co., Ltd.	2114S	Min 240V; Min 1,5A; Flame class min. V-2;	IEC 61558-1 EN 61558-1 (ECBT2)	Accepted UR E144392	
Input connector CON1 Alternative	+ Joint Tech Electronic Industrial Co. Ltd.	A7920 series	Min 250V; Min 7A; Flame class min. V-2;	IEC 61558-1 EN 61558-1 (ECBT2)	Accepted UR E179987	

20		TABLE: Components				P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of con- formity ¹⁾	
Input connector CON1 Alternative	+ Joint Tech Electronic Industrial Co. Ltd.	A3960 series	Min 250V; Min 7A; Flame class min. V-2;	IEC 61558-1 EN 61558-1 (ECBT2)	Accepted UR E179987	
Input connector CON1 Alternative	+ Zhejiang Hongxing Electrical Co. Ltd.	HX396XX- YYY series	Min 250V; Min 5A; Flame class min. V-2;	IEC 61558-1 EN 61558-1 (ECBT2)	Accepted UR E228500	
GTM91128LI1CEL; GTM91128LI2CEL; GTM91128LI3CEL						
Enclosure (electrical, mechanical, fire)	+ SABIC Innovative Plastics	SE1X SE1 SE100 HF500R CX7211 EXCY0098 C2950	Rated min. V-1 at min. 2,0 mm thickness; RTI = 95°C Overall dimensions: 118 by 53 by 37 mm Top and bottom cover are ultrasonic welded.	IEC 61558-1 EN 61558-1 (QMFZ2)	Accepted UR E45329	
Enclosure (electrical, mechanical, fire) Alternative	+ Tejin Chemi- cals	LN-1250P LN-1250G	Rated min. V-1 at min. 2,0 mm thickness; RTI = 125°C Overall dimensions: 118 by 53 by 37 mm Top and bottom cover are ultrasonic welded.	IEC 61558-1 EN 61558-1 (QMFZ2)	Accepted UR E50075	
Insulation foil between PCB bottom side and enclosure	+ SKC CO LTD	SH71S	Rated VTM-2 at min 0,076 mm thickness; RTi = 105°C OD: 106 by 48 mm; thickness 0,43 mm	IEC 61558-1 EN 61558-1 (QMFZ2)	Accepted UR E74359	
PCB	+ Brite Plus Electronics (Suzhou)	DGV0-3A DKV0-3A	OD: 90 by 39 mm; thickness 1,6 mm Rated 94V-0; 130°C	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UR E177671	
PCB Alternative	Techni Tech- nology Ltd	T2A / T2B / T4	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E154355	
PCB Alternative	Dongguan He Tong Electron- ics Co Ltd	CEM1 / 2V0 / FR4	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E243157	
PCB Alternative	Cheerful Elec- tronic (Hk) Ltd	03 / 03A	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E199724	
PCB Alternative	Dongguan Daysun Elec- tronic Co Ltd	DS2	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E251754	
PCB Alternative	Suzhou City Yilihua Elec- tronics Co Ltd	YLH-1	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E251781	

20	TABLE: Components					P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of con- formity ¹⁾	
PCB Alternative	Shanghai Arex Precision Electronic Co Ltd	02V0 04V0	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E186016	
PCB Alternative	Kuotiang Ent Ltd	C-2 C-2A	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E227299	
PCB Alternative	Tongchuangxin Electronics Co Ltd	TCX	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E250336	
PCB Alternative	Pacific Win Industrial Ltd	PW-02 PW-03	V-0, 130°C, min thickness: 1,6mm	IEC 61558-1 EN 61558-1 (ZPMV2) UL 796	Accepted UL E228070	
PCB Control board	+ Suzhou Yili-hua Electronics	YLH-2	OD: 27 by 21 mm; thickness 1,6 mm Rated 94V-0; 130°C	IEC 61558-1 EN 61558-1 (ZPMV2)	Accepted UR E251781	
Appliance inlet CON1 Class II units	+ Zhejiang LECI Electronics	DB-8	250 Vac; 2,5A; 2 pins	IEC/EN 60320-1 (AXUT2)	VDE 40032028 UR E302229	
Appliance inlet CON1 Class II units Alternative	+ Delikang Electronics Technology Co Ltd	CDJ-8	250 Vac; 2,5A; 2 pins	IEC/EN 60320-1 (AXUT2)	VDE 40025531 UR E217394	
Appliance inlet CON1 Class II units Alternative	+ Rich Bay Co Ltd	R-201SN90	250 Vac; 2,5A; 2 pins	IEC/EN 60320-1 (AXUT2)	VDE 40030384 UR E184638	
Appliance inlet CON1 Class II units Alternative	+ Sun Fair Electric Wire & Cable (HK) Co Ltd	S-01	250 Vac; 2,5A; 2 pins	IEC/EN 60320-1 (AXUT2)	VDE 40034449 UR E226643	
Appliance inlet CON1 Class II units Alternative	+ Tecx-unions Technology Corp	SO-222 series	250 Vac; 2,5A; 2 pins	IEC/EN 60320-1 (AXUT2)	VDE 40020337 UR E220004	
For all models						
Fuse F1, F2	Walter Electronic	ICP 2010	T3,15A; 250Vac 3,6×10 mm; pigtail leads	IEC 60127 (JDYX2) (JDYX8)	VDE 40012824 cURus E56092	
Fuse F1, F2 Alternative	+ Zhongshan Lanbao Electrical Appliances	RTI-10	T3,15A; 250Vac 3,6×10 mm; pigtail leads	IEC 60127 (JDYX) (JDYX7)	VDE cULus E213695	
Fuse F1, F2 Alternative	Conquer	MST	T3,15A; 250Vac 8,35 x 4,3 x 7,7 mm	IEC 60127 (JDYX2) (JDYX8)	VDE cURus E82636	

20	TABLE: Components					P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of con- formity ¹⁾	
Fuse F1, F2 shrink tubing (for fuses with pigtail leads)	Woer Heat-Shrinkable Material	RSFR-H	Rated: 600V; 125°C; VW-1	IEC 61558-1 EN 61558-1 (YDPU2)	Accepted UR E203950	
Varistor MOV (Optional)	+ Joyin Co., Ltd.	JVR10N471 K	300V rms; 385V d.c., 3kA, 8/20µs diameter: 10 mm	IEC 61558-1 EN 61558-1 IEC 60950-1 EN 60950-1 Annex Q IEC 61051-2 (VZCA2) (VZCA8)	VDE cURus E325508	
Varistor MOV (Optional) Alternative	+ JOYIN CO., LTD	JVR14N471 K	300V rms; 385V d.c., 3kA, 8/20µs diameter: 14 mm	IEC 61558-1 EN 61558-1 IEC 60950-1 EN 60950-1 Annex Q IEC 61051-2 (VZCA2) (VZCA8)	VDE cURus E325508	
X-Capacitor CX1	+ Cheng Tung Industrial	CTX	Min. 250Vac; max. 0,47µF; min. X2	IEC/EN 60384-14 (FOWX2)	VDE 40022642 UR E193049	
X-Capacitor CX1 Alternative	+ Dain Electronics Co Ltd	MPX	Min. 250Vac; max. 0,47µF; min. X2	IEC/EN 60384-14 (FOWX2) (FOWX8)	VDE 40018798 cURus E147776	
X-Capacitor CX1 Alternative	+ Ultra Tech Xiphi	UTX	Min. 250Vac; max. 0,47µF; min. X2	IEC/EN 60384-14 (FOWX2)	VDE 40023119 UR E183780	
Y-Capacitor CY1, CY2 CY2 is optional	+ Murata Mfg Co Ltd	KX Series	Min. 250Vac; max. 1000pF; min. Y1	IEC/EN 60384-14 (FOWX2)	VDE 40002796 UR E37921	
Y-Capacitor CY1, CY2 Alternative CY2 is optional	+ SUCCESS	SE, SB	Min. 250Vac; max. 1000pF; min. Y1	IEC/EN 60384-14 (FOWX2) (FOWX8)	VDE 121379 VDE 118218 cURus E114280	
Y-Capacitor CY1, CY2 Alternative CY2 is optional	+ TDK	CD	Min. 250Vac; max. 1000pF; min. Y1	IEC/EN 60384-14 (FOWX2)	VDE124321 UR E37861	
Y-Capacitor CY1, CY2 Alternative CY2 is optional	+ WALSIN TECHNOLOGY CORP	AH	Min. 250Vac; max. 1000pF; min. Y1	IEC/EN 60384-14 (FOWX2) (FOWX8)	VDE 40001804 cURus E146544	
Y-Capacitor CY1, CY2 Alternative CY2 is optional	+ JYA-NAY CO LTD	JN	Min. 250Vac; max. 1000pF; min. Y1	IEC/EN 60384-14 (FOWX2) (FOWX8)	VDE 40001831 cURus E201384	

20	TABLE: Components					P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of con- formity ¹⁾	
Inductor LF1	Suzhou Hejia Electronics / GlobTek	GTM91120- LF1	Open type construction OD: 15,5 by 16,0 by 12,0 mm Rated: Min.17mH Core: Ferrite Coil: copper magnet wire wound on bobbin Bobbin: T375J T375HF,PBT- 4130 (Chang Chun Plastics, cURus E59481) Bobbin: PM9830 (SUMITOMO BAKELITE CO LTD; cURus E41429) Rated V-0 Temperature Class: B	IEC 61558-1 EN 61558-1	Accepted	
Diode D1, D2, D3, D4	+ Micro Commercial Components	FR207	Rated: min 2A; min 1000V	IEC 61558-1 EN 61558-1	Accepted	
Insulation tape on sec. heatsink HS2	+ Jingjiang Yahua Pressure- sensitive Adhesive	PZ, CT	Polyester tape130°C 0,05 mm thickness; 3 layers used	IEC 61558-1 EN 61558-1 (OANZ2)	Accepted UR E165111	
Transistor Q1	+ Unisonic Technologies	7N60	Rated: min 7A; min 600V Mounted on the prim. heatsink HS1 by screw.	IEC 61558-1 EN 61558-1	Accepted	
Electrolytic capacitor C2	+ Nippon Chemi-Con	KMM	Rated: min.68µF; min.400V; 105°C	IEC 61558-1 EN 61558-1	Accepted	
Transformer T1 (5V-7,5V)	GlobTek / BOAM / Zhongtong	GT-3005001	Open type construction OD: 25 by 22 by 14 mm Rating: Input: 100-240V Output: 5-7,5V Core: Ferrite, EE2218W Insulation is achieved by triple insulation wire on secondary winding Temperature Class: B	IEC 61558-1 EN 61558-1	Accepted	
Transformer T1 (7,6V-10,5V)	GlobTek / BOAM / Zhongtong	GT-3009001	Open type construction OD: 25 by 22 by 14 mm Rating: Input: 100-240V Output: 7,6-10,5V Core: Ferrite, EE2218W Insulation is achieved by triple insulation wire on secondary winding Temperature Class: B	IEC 61558-1 EN 61558-1	Accepted	

20	TABLE: Components					P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of con- formity ¹⁾	
Transformer T1 (10,6V-14,5V)	GlobTek / BOAM / Zhongtong	GT-3012001	Open type construction OD: 25 by 22 by 14 mm Rating: Input: 100-240V Output: 10,6-14,5V Core: Ferrite, EE2218W Insulation is achieved by triple insulation wire on secondary winding Temperature Class: B	IEC 61558-1 EN 61558-1	Accepted	
Transformer T1 (14,6V-19,5V)	GlobTek / BOAM / Zhongtong	GT-3015001	Open type construction OD: 25 by 22 by 14 mm Rating: Input: 100-240V Output: 14,6-19,5V Core: Ferrite, EE2218W Insulation is achieved by triple insulation wire on secondary winding Temperature Class: B	IEC 61558-1 EN 61558-1	Accepted	
Transformer T1 (19,6V-24V)	GlobTek / BOAM / Zhongtong	GT-3024001	Open type construction OD: 25 by 22 by 14 mm Rating: Input: 100-240V Output: 19,6-24V Core: Ferrite, EE2218W Insulation is achieved by triple insulation wire on secondary winding Temperature Class: B	IEC 61558-1 EN 61558-1	Accepted	
Transformer T1 (24,1V-48V)	GlobTek / BOAM / Zhongtong	GT-3048001	Open type construction OD: 25 by 22 by 14 mm Rating: Input: 100-240V Output: 24,1-48V Core: Ferrite, EE2218W Insulation is achieved by triple insulation wire on secondary winding Temperature Class: B	IEC 61558-1 EN 61558-1	Accepted	
Transformer T1 Bobbin	Chang Chun Plastics	T375J	Rated: V-0 at min. 0,75 mm thickness; min. 150°C	IEC 61558-1 EN 61558-1 (QMFZ2) (QMFZ8)	Accepted cURus E59481	
Transformer T1 Bobbin Alternative	Chang Chun Plastics	T375HF	Rated: V-0 at min. 0,43 mm thickness; min. 150°C	IEC 61558-1 EN 61558-1 (QMFZ2) (QMFZ8)	Accepted cURus E59481	
Transformer T1 Bobbin Alternative	Chang Chun Plastics	PBT-4130	Rated: V-0 at min. 0,74 mm thickness; min. 140°C	IEC 61558-1 EN 61558-1 (QMFZ2) (QMFZ8)	Accepted cURus E59481	

20	TABLE: Components					P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of con- formity ¹⁾	
Transformer T1 Bobbin Alternative	Sumitomo	PM-9820	Rated: V-0 at min. 0,74 mm thickness; min. 150°C	IEC 61558-1 EN 61558-1 (QMFZ2) (QMFZ8)	Accepted cURus E41429	
Transformer T1 Bobbin Alternative	Hitachi Chemical	CP-J-8800	Rated: V-0 at min. 0,74 mm thickness; min. 150°C	IEC 61558-1 EN 61558-1 (QMFZ2) (QMFZ8)	Accepted cURus E42956	
Transformer T1 Primary wire	JIANGSU DARTONG M & E CO LTD	UEW	Enamelled Cu-wire; Diameter 0,35 and 0,19 mm Min: 130°C	IEC 61558-1 EN 61558-1 (OBMW2)	Accepted UR E237377	
Transformer T1 Secondary wire	Great leoflon industrial co ltd	TRWB	Triple insulated wire Diameter: 0,45 mm 130°C	IEC 61558-1 EN 61558-1 IEC/EN 60950-1 Annex U (OBJT2)	Accepted VDE 136581 UR E211989	
Transformer T1 Secondary wire Alternative	Cosmolink	TIW-M	Triple insulated wire Diameter: 0,45 mm 130°C	IEC 61558-1 EN 61558-1 IEC/EN 60950-1 Annex U (OBJT2)	Accepted VDE 138053 UR E213764	
Transformer T1 Secondary wire Alternative	Furukawa	TEX-E	Triple insulated wire Diameter: 0,45 mm 130°C	IEC 61558-1 EN 61558-1 IEC/EN 60950-1 Annex U (OBJT2)	Accepted VDE 6735 UR E206440	
Transformer T1 Insulation tape	Jingjiang Yahua Pressure- sensitive Adhesive	PZ, CT	Polyester tape 130°C 0,025 mm and 0,05 mm thickness	IEC 61558-1 EN 61558-1 (OANZ2)	Accepted UR E165111	
Transformer T1 Insulation tape Alternative	Jingjiang jingyi	JY25-A	Polyester tape 130°C 0,025 mm and 0,05 mm thickness	IEC 61558-1 EN 61558-1 (OANZ2)	Accepted UR E246950	
Transformer T1 Tubing	Great Holding industrial	TFL	Rated: 150V; 200°C; VW-1	IEC 61558-1 EN 61558-1 (YDPU2)	Accepted UR E156256	
Optocoupler U2	+ Everlight Electronics Co Ltd	EL817 series	Dti >0,5mm, int. cr > 6,0mm, ext. cr > 7,7mm, Isolation 3000Vac min., 100°C min., Thermal cycling test	IEC/EN 60950-1: 2005, VDE 0884 GB4943.1- 2011 (FPQU2) (FPQU8)	FIMKO, VDE, CQC cURus E214129	

20	TABLE: Components					P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity ¹⁾	
Optocoupler U2 Alternative	+ LITE-ON	LTV-817	Dti >0,6mm, int. cr > 5,2mm, ext. cr > 7,8mm, Isolation 3000Vac min., 100°C min., Thermal cycling test	IEC/EN 60950-1: 2005, VDE 0884 GB4943.1- 2011 (FPQU2) (FPQU8)	VDE 94722 cURus E113898	
Optocoupler U2 Alternative	+ TOSHIBA	TLP781F	Dti > 0,4mm, Ext cr > 8,0mm, Isolation 3000Vac min., 110°C min., Thermal cycling test	IEC 60950-1 VDE0884 (FPQU2) (FPQU8) IEC 61558-1	SEMKO VDE cURus E67349	
Optocoupler U2 Alternative	+ COSMO	K1010	Dti > 0,4mm, Int cr > 5,3mm, Ext cr > 8,0mm, Isolation 3000Vac min., 100°C min., Thermal cycling test	IEC/EN 60950-1: 2005, VDE 0884 GB4943.1- 2011 (FPQU2) (FPQU8)	FIMKO, VDE, CQC cURus E169586	
Diode D7	+Liteon	SBL3045CT	Min. 10A; min.45V Mounted on heatsink HS2	IEC 61558-1 EN 61558-1	Accepted	
Electrolytic capacitor C11, C12	+SAMXON	KM	Min. 2200µF; 10V; 16V; 35V; 63V; The cap. voltage depends on rated output voltage.	IEC 61558-1 EN 61558-1	Accepted	
1) ¹⁾ Provided evidence ensures the agreed level of compliance. See OD-CB2039. 2) + means, that components from other vendor and other model number, but with the same or better/higher rating and equivalent approvals are accepted						

25	TABLE: Threaded Part Torque Test			N/A
Threaded part identification	Diameter of thread (mm)	Column number (I, II, or III)	Applied torque (Nm)	
Supplementary information:				

26	TABLE: Clearance and creepage distance measurements						P
clearance cl and creepage distance dcr at/of:	Up (V)	U r.m.s. (V)	Required cl (mm)	cl (mm)	required dcr (mm)	dcr (mm)	
GTM91120-30XX-T(P)B							
Line to Neutral before fusible resistor	340	240	2,4	4,6	2,5	4,6	
Primary to functional earth (Class I)	340	240	2,4	6,1	2,5	6,1	
Primary to secondary on transformer T1	526	278	5,2	>8,4	5,6	>8,4	
Primary to secondary on PCB under transformer T1	526	278	5,2	8,0	5,6	11,2	
Primary to secondary on optocoupler U2	400	255	4,8	7,7	5,1	7,7	
Primary to enclosure outside	526	278	5,2	8,2	5,6	>8,4	
GTM91120-30XX-FB							
Line to Neutral before fusible resistor	340	240	2,4	2,8	2,5	2,8	
Primary to functional earth (Class I)	340	240	2,4	5,0	2,5	5,0	
Primary to secondary on transformer T1	526	278	5,2	>8,4	5,6	>8,4	
Primary to secondary on PCB under transformer T1	526	278	5,2	8,0	5,6	11,2	
Primary to secondary on optocoupler U2	400	255	4,8	7,7	5,1	7,7	
GTM91128LI1CELL, GTM91128LI2CELL, GTM91128LI3CELL							
Line to Neutral before fusible resistor	340	240	2,4	4,6	2,5	4,6	
Primary to secondary on transformer T1	526	278	5,2	>8,4	5,6	>8,4	
Primary to secondary on PCB under transformer T1	526	278	5,2	8,0	5,6	11,2	
Primary to secondary on optocoupler U2	400	255	4,8	7,7	5,1	7,7	
Primary to enclosure outside	526	278	5,2	>8,4	5,6	>8,4	
Supplementary information:							

26	TABLE: Distance Through Insulation Measurements				P
Distance through insulation di at/of:	U r.m.s. (V)	Test voltage (V)	Required dti (mm)	dti (mm)	
Enclosure (solid)	278	3995	0,46	min. 1,5	
Primary-Secondary (thin sheet layers)	278	1997	*	0,11	
Supplementary information:					
* required basic insulation between enameled primary wire and secondary TIW wire.					

26.2 TEST A	TABLE: CREEPAGE DISTANCES AND CLEARANCES AND DISTANCES THROUGH INSULATION					N/A
Test with three special prepared specimens with uninsulated wires, without potting or impregnation						
cycles with 2 x working voltage between pri / sec	68 h at the temperature acc. Cl. 14 (min. 85 °C)	1 hour 25 °C	2 hour 0 °C	1 hour 25 °C		
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						

BB.26.2 TEST B	TABLE: CREEPAGE DISTANCES AND CLEARANCES AND DISTANCES THROUGH INSULATION					N/A
Test with three specially prepared specimens with potted – P1 values are required						
cycles with 2 x working voltage between pri / sec	68 h at the temperature acc. Cl. 14 (min. 85 °C)	1 hour 25 °C	2 hour 0 °C	1 hour 25 °C		
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						

26.2 TEST C	TABLE: CREEPAGE DISTANCES AND CLEARANCES AND DISTANCES THROUGH INSULATION					N/A
Test with three specially prepared specimens with potting (only dti is required)						
cycles with 2 x working voltage between pri / sec	68 h at the temperature acc. Cl. 14 (min. 85 °C)	1 hour 25 °C	2 hour 0 °C	1 hour 25 °C		
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						

26.107 61558-2- 16/A1	TABLE: CREEPAGE DISTANCES AND CLEARANCES AND DISTANCES THROUGH INSULATION					N/A
Test for transformers, use FIW-wire						
cycles with 2 x working voltage between pri / sec	68 h at the temperature acc. Cl. 14 (min. 85 °C)	1 hour 25 °C	2 hour 0 °C	1 hour 25 °C		
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						

27		TABLE: Resistance to heat and fire - Glow wire tests						P
Object/ Part No./ Material	Manufacturer / trademark	Glow wire test (GWT); (°C)						Verdict
		550	650		750		850	
			t _e	t _i	t _e	t _i		
Enclosure	SABIC Inno- vative Plastics	P	0	0	/	/	/	P
Enclosure Alternative	Tejin Chemi- cals	P	0	0	/	/	/	P
European Plug	ZhongRui R-EU	P	0	0	0	0	P	P
Input connector CON1	Neltron Industrial Co., Ltd. (2114S)	P	0	0	0	0	P	P
Appliance inlet CON1 Class I units	Zhejiang LECI Electronics (DB-6)	P	0	0	0	0	P	P
Appliance inlet CON1 Class II units	Zhejiang LECI Electronics (DB-8)	P	0	0	0	0	P	P
Transformer bobbin	GlobTek (GT-30xx001)	P	0	0	0	0	P	P
Object/ Part No./ Material	Manufacturer/ trademark	Glow-wire flammability index (GWFI), °C				GW ignition temp. (GWIT), °C		Verdict
		550	650	750	850	675	775	

Supplementary information:
 550°C GWT not relevant (or applicable) to parts of material classified at least HB40 or if relevant HBF
 The GWIT pre-selection option, the 850°C GWFI pre-selection option, and the 850°C GWT are not relevant
 (or applicable) for attended appliances.

Annex U	U.5.1 THERMAL ENDURANCE TEST													
Type ref.														
Rated PRI-Voltage														
Rated SEC-Voltage														
Material of Winding														
Material of bobbin														
Material of resin														
Material of potting														
Material of foil														
Components removed for test														
tw														
S														
Objective test duration (days)														
Theoretical test temperature														
Sample	1		2		3		4		5		6		7	
Winding	PRI	SEC	PRI	SEC	PRI	SEC	PRI	SEC	PRI	SEC	PRI	SEC	PRI	SEC
Start – Rk														
After 4 h – Rw														
After 4 h – winding temperature														
After 4 h - oven temperature														
After 24 h – Rw														
After 24 h – winding temperature														
After 24 h - oven temperature														
Final test period (days)														
Output voltage (11.1) under load														
Insulating resistance														
High voltage test (35% of the values in Table 8.a														

Annex U	U.5.2 The use of another constant S other than 4500 in tw tests Test1:10 days													
Type ref.														
Rated PRI-Voltage														
Rated SEC-Voltage														
Material of Winding														
Material of bobbin														
Material of resin														
Material of potting														
Material of foil														
Components removed for test														
tw														
S														
Objective test duration (days)														
Theoretical test temperature														
Sample	1		2		3		4		5		6		7	
Winding	PRI	SEC	PRI	SEC	PRI	SEC	PRI	SEC	PRI	SEC	PRI	SEC	PRI	SEC
Start – Rk														
After 4 h – Rw														
After 4 h – winding temperature														
After 4 h - oven temperature														
After 24 h – Rw														
After 24 h – winding temperature														
After 24 h - oven temperature														
Final test period (days)														
Output voltage (11.1) under load														
Insulating resistance														
High voltage test (35% of the values in Table 8.a)														

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Clause	Requirement + Test	Result - Remark	Verdict

Annex U	U.5.2 The use of another constant S other than 4500 in tw tests Test2:120 days													
Type ref.														
Rated PRI-Voltage														
Rated SEC-Voltage														
Material of Winding														
Material of bobbin														
Material of resin														
Material of potting														
Material of foil														
Components removed for test														
tw														
S														
Objective test duration (days)														
Theoretical test temperature														
Sample	1		2		3		4		5		6		7	
Winding	PRI	SEC	PRI	SEC	PRI	SEC	PRI	SEC	PRI	SEC	PRI	SEC	PRI	SEC
Start – Rk														
After 4 h – Rw														
After 4 h – winding temperature														
After 4 h - oven temperature														
After 24 h – Rw														
After 24 h – winding temperature														
After 24 h - oven temperature														
Final test period (days)														
Output voltage (11.1) under load														
Insulating resistance														
High voltage test (35% of the values in Table 8.a														

List of test equipment used:

A completed list of used test equipment shall be provided in the Test Reports when a Manufacturer Testing Laboratory according to TMP/CTF stage 1 or WMT/CTF stage 2 procedure has been used.

Clause	Measurement / testing	Testing / measuring equipment / material used, (Equipment ID)	Range used	Calibration due date
9	Standard test finger	TESTING T5-75 (SIQ 103477)	-	-
	Touch current	KIKUSUI TOS3200 (SIQ 106687)	-	2015-11-12
	Oscilloscope	Yokogawa DLM 2202 (SIQ 106871)	-	2015-05-26
	Small test finger	TESTING finger (SIQ 103602)	-	2019-07-23
11, 12, 14, 15	Power meter	Yokogawa WT210 (SIQ 106752)	2 A; 300 V	2015-08-29
	Multimeter	Fluke 87 V (SIQ 105194)	60 V	2016-01-13
	Multimeter	Fluke 87 V (SIQ 105195)	6 A	2016-01-13
14, 15	Thermometer	Keithley 2700 (SIQ 106708)	200°C	2015-11-03
16	Spring hammer	PTL F 22.50 (SIQ 102401)	0,5 J	2017-08-21
	Scale	Kern & Sohn PCB 10000-1 (SIQ 106920)	-	2015-09-03
17	Humidity	Ahlborn Almemo 2590-3S (SIQ 105224)	-	2016-03-11
14, 15, 16, 17, 18	Dielectric strength test	KIKUSUI TOS5301 (SIQ 106936)	5 kV~	2015-12-01
18	Insulation resistance	KIKUSUI SM001164 (SIQ 106873)	500 V	2015-05-30
	Touch current	KIKUSUI TOS3200 (SIQ 106687)	-	2015-11-12
	Impulse generator 1,2/50	TESTING T3-61 (SIQ 106921)	-	2015-09-11
	High Voltage Probe	Tektronix P6015A (SIQ 103880)	-	2014-04-02
26	Digital caliper	Mitutoyo CD-15CP (SIQ 104411)	150±0,01 mm	2016-04-18
	Dielectric tester	KIKUSUI TOS5301 (SIQ 106936)	5 kV~	2015-12-01
27	Ball pressure test	TESTING T4-03 (SIQ 104390)	-	2017-05-18
	Digital caliper	Mitutoyo CD-15CP (SIQ 104411)	150±0,01 mm	2016-04-18
	Glow wire test	PTL T03.14 (SIQ 102252)	960°C	2016-12-03
	Stopwatch	Q & Q (SIQ 104353)	-	2015-12-08

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Clause	Requirement + Test	Result - Remark	Verdict
AA	Annex AA		N/A
	Partial discharge (PD) test		N/A
BB	Annex BB		N/A
	Particular requirements for associated transformers for switch mode power supplies with internal frequencies > 500 Hz		N/A
	See separate test report-form for these Annex.		N/A
BB.8	MARKING AND OTHER INFORMATION		N/A
BB.8.2	Marking for transformers IP00 or for associated transformers: type and trademark, instruction sheets		N/A
BB.8.11	Correct symbols:		N/A
	Volts	V	N/A
	Amperes	A (mA)	N/A
	Volt amperes (or volt-amperes reactive for reactors)	VA or (VAR)	N/A
	Watts	W	N/A
	Hertz	Hz	N/A
	Input	PRI	N/A
	Output	SEC	N/A
	Direct current	d.c. (DC) or	N/A
	Neutral	N	N/A
	Single-phase a.c.		N/A
	Three-phase a.c.	3	N/A
	Three-phase and neutral a.c.	3N	N/A
	Power factor	cosφ	N/A
	Class II construction		N/A
	Class III construction		N/A
	Fuse-link		N/A
	Rated max. ambient temperature	t_a	N/A
	Frame or core terminal		N/A
	Protective earth		N/A
	IP number	IPXX	N/A
	Earth (ground for functional earth)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	For indoor use only		N/A
	tw5 YYY		N/A
	tw10 YYY		N/A
	twx YYY		N/A
	Additional Symbols (IEC 61558-2-16:09)		N/A
	SMPS incorporating a Fail-safe separating transformer	or	N/A
	Additional Symbols (IEC 61558-2-16:09)		N/A
	SMPS incorporating a Non-short-circuit-proof separating transformer	or	N/A
	SMPS incorporating a Short-circuit-proof separating transformer (inherently or non-inherently)	or	N/A
	SMPS incorporating a Fail-safe isolating transformer	or	N/A
	SMPS incorporating a Non-short-circuit-proof isolating transformer	or	N/A
	SMPS incorporating a Short-circuit-proof isolating transformer (inherently or non-inherently)	or	N/A
	SMPS incorporating a Fail-safe safety isolating transformer		N/A
	SMPS incorporating a Non-short-circuit-proof safety isolating transformer		N/A
	SMPS incorporating a Short-circuit-proof safety isolating transformer (inherently or non-inherently)		N/A
	SMPS (Switch mode power supply unit)		N/A

BB.9	PROTECTION AGAINST ELECTRIC SHOCK	N/A
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BB.10	CHANGE OF INPUT VOLTAGE SETTING	N/A
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BB.11	OUTPUT VOLTAGE AND OUTPUT CURRENT UNDER LOAD	N/A
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BB.12	NO-LOAD OUTPUT VOLTAGE (see supplementary requirements in Part 2)	N/A
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BB.13	SHORT-CIRCUIT VOLTAGE	N/A
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BB.14	HEATING	N/A
BB.14.2	Application of 14.1 or 14.3 according to the insulation system	N/A
BB.14.2.1	Class of isolating system (classified materials according to IEC 60 085 and IEC 60 216)	N/A
BB.14.2.2	No classified material, or system but the measured temperature does not exceed the value of Class A	N/A
BB.14.2.3	No classified material or system but the measured temperature exceeds the value for Class A, the live parts of the transformers are submitted to the test of 14.3	N/A
BB.14.3	Accelerated ageing test for undeclared class of isolating system	N/A
	Cycling test (10 cycles):	N/A
	– measuring of the no-load input current (mA)	N/A
BB.14.3.1	– heat run (temperature in table 2)	N/A
BB.14.3.2	– vibration test: 30 min; amplitude 0,35 mm; frequency range: 10 Hz, 55 Hz, 10 Hz	N/A
BB.14.3.3	– moisture treatment (48 h, 17.2)	N/A
BB.14.3.4	Measurements and tests at the beginning and after each test:	N/A
	– deviation of the no-load input current, measured at the beginning of the test is $\leq 30\%$	N/A
	– insulation resistance acc. cl.18.1 and 18.2	N/A
	– electric strength, no breakdown (18.3); 2 min; test voltage 35% of specified value (table VI)	N/A
	– Transformers (50 or 60 Hz version) are tested after the dielectric strength test as follows: under no load; duration: 5 min; $U_{pri}(V)$: 1,2 times rated supply voltage; frequency (Hz): 2 times rated frequency	N/A

BB.15	SHORT-CIRCUIT AND OVERLOAD PROTECTION	N/A
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BB.16	MECHANICAL STRENGTH	N/A
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BB.17	PROTECTION AGAINST HARMFUL INGRESS OF WATER AND MOISTURE	N/A
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IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict

BB.18	INSULATION RESISTANCE AND ELECTRIC STRENGTH		N/A
BB.18.2	Insulation resistance between:		N/A
	– live parts and body for basic insulation $\geq 2 \text{ M}\Omega$		N/A
	– live parts and body for reinforced insulation $\geq 7 \text{ M}\Omega$		N/A
	– input circuits and output circuits for basic insulation $\geq 2 \text{ M}\Omega$		N/A
	– input circuits and output circuits for double or reinforced insulation $\geq 5 \text{ M}\Omega$		N/A
	– each input circuit and all other input circuits connected together $\geq 2 \text{ M}\Omega$		N/A
	– each output circuit and all other output circuits connected together $\geq 2 \text{ M}\Omega$		N/A
	– hazardous live parts and metal parts with basic insulation (Class II transformers) $\geq 2 \text{ M}\Omega$		N/A
	– body and metal parts with basic insulation (Class II transformers) $\geq 5 \text{ M}\Omega$		N/A
	– metal foil in contact with inner and outer surfaces of enclosures $\geq 2 \text{ M}\Omega$		N/A
BB.18.3	Electric strength test (1 min): no flashover or breakdown:		N/A
	1) basic insulation between input circuits and output circuits; working voltage (V); test voltage (V)		N/A
	2) double or reinforced insulation between input circuits and output circuits; working voltage (V); test voltage (V)		N/A
	3) basic or supplementary insulation between:		N/A
	a) live parts of different polarity; working voltage (V); test voltage (V)		N/A
	b) live parts and the body if intended to be connected to protective earth		N/A
	c) inlet bushings and cord guards and anchorages		N/A
	d) live parts and an intermediate conductive part		N/A
	e) intermediate conductive parts and body :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	4) Reinforced insulation between the body and live parts; working voltage (V); test voltage (V)		N/A
	5) Functional insulation for windings intended to be connected in series or parallel (test voltage = working voltage + 500 V) (IEC 61558-2-16:2009)		N/A
18.102 (A1)	Partial discharge tests according IEC 60664-1 , if the working voltage is > 750 V peak		N/A
	Partial discharge is ≤ 10 pC at time P2 See Fig. 19.101		N/A

BB.19	CONSTRUCTION		N/A
BB.19.1	Separation of input and output circuits		N/A
BB.19.1.1	SMPS incorporating auto-transformers (IEC 61558-2-16:2009)		N/A
BB.19.1.2	SMPS incorporating separating transformers (IEC 61558-2-16:2009)		N/A
BB.19.1.2.1	Input and output circuits electrically separated. (IEC 61558-2-16:09)		N/A
BB.19.1.2.2	The insulation between input and output winding(s) consist of basic insulation (IEC 61558-2-16:09)		N/A
	Class I SMPS		N/A
	– Insulation between input windings and body consist of basic insulation		N/A
	– Insulation between output windings and body consist of basic insulation		N/A
	Class II SMPS (IEC 61558-2-16:09)		N/A
	– Insulation between input windings and body consist of double or reinforced insulation		N/A
	– Insulation between output windings and body consist of double or reinforced insulation		N/A
BB.19.1.2.3	The insulation between input windings and intermediate conductive parts and the output windings and intermediate part consist of basic insulation (IEC 61558-2-16:09)		N/A
	For class I SMPS the insulation between input and output windings via the intermediate conductive parts consist of basic insulation (IEC 61558-2-16:09)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	For class II SMPS the insulation between input winding and the body and between the output windings and the body via the intermediate conductive parts consist of double or reinforced insulation (IEC 61558-2-16:09)		N/A
BB.19.1.2.4	Parts of output circuits may be connected to protective earth (IEC 61558-2-16:09)		N/A
BB.19.1.2.5	No direct contact between output circuits and the body, unless: (IEC 61558-2-16:2009)		N/A
	– Allowed for associated transformers by the equipment standard		N/A
	– Clause 19.8 of part 1 is fulfilled		N/A
BB.19.1.3	SMPS incorporating isolating transformers and safety isolating transformers (IEC 61558-2-16:09)		N/A
BB.19.1.3.1	Input and output circuits electrically separated (IEC 61558-2-16:09)		N/A
	No possibility of any connection between these circuits		N/A
BB.19.1.3.2	The insulation between input and output winding(s) consist of double or reinforced insulation (exception see 19.1.3.4) (IEC 61558-2-16:09)		N/A
	Class I SMPS not intended for connection to the mains by a plug:		—
	– Insulation between input windings and body connected to earth consist of basic insulation rated to the input voltage		N/A
	– Insulation between output windings and body, connected to earth consist of basic insulation rated for the output voltage		N/A
	Class I SMPS intended for connection to the mains by a plug (EN 61558-2-16:09):		N/A
	– Insulation between input windings and body connected to earth consist of basic insulation rated to the working voltage		N/A
	– Insulation between output windings and body, connected to earth consist of supplementary insulation rated for the working voltage		N/A
	Class II SMPS (IEC 61558-2-16:09)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	– Insulation between input windings and body consist of double or reinforced insulation rated to the input voltage		N/A
	– Insulation between output windings and body consist of double or reinforced insulation, rated to the output voltage		N/A
BB.19.1.3.3	SMPS with intermediate conductive parts not connected to the body (between input/output) (EN 61558-2-16:09):		-
19.1.3.3.1	For class I and class II SMPS the insulation between input and output windings, via intermediate conductive parts, consist of double or reinforced insulation, rated to the working voltage (EN 61558-2-16:09)		N/A
	– For class II SMPS the insulation between input winding and the body and between the output windings and the body via the intermediate conductive parts consist of double or reinforced insulation. (rated to the input voltage, for SELV circuits only basic insulation to the body))		N/A
	– For transformers, different from independent, the insulation between input and output windings, via intermediate conductive parts, consist of double or reinforced insulation, rated to the working voltage.		N/A
BB.19.1.3.3.2	Class I transformers with earthed core, and not allowed for class II equipment (EN 61558-2-16:09)		N/A
	– Insulation from the input to the earthed core: basic insulation rated for the input voltage		N/A
	– Insulation from the output voltage to the earthed core: basic insulation rated for the output voltage		N/A
BB.19.1.3.3.3	Insulation between : input to intermediate conductive parts and output and intermediate parts consist of at least basic insulation (EN 61558-2-16:09)		N/A
	– If the insulation from input or output to the intermediate metal part is less than basic insulation, the part is considered to be connected to input or output.		N/A
BB.19.1.3.4	For class I SMPS, with protective screen, not connected to the mains by a plug the following conditions comply (EN 61558-2-16:09):		N/A
	– The insulation between input winding and protective screen consist of basic insulation (rated input voltage)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	– The insulation between output winding and protective screen consist of basic insulation (rated output voltage)		N/A
	– The protective screen consist of metal foil or a wire wound screen extending the full width of the windings and has no gaps or holes		N/A
	– Where the protective screen does not cover the entire width of the input winding, additional insulation to ensure double insulation in this area, is used.		N/A
	– If the screen is made by a foil, the turns are isolated, overlap at least 3 mm		N/A
	– The cross-section of the screen and the lead out wire is at least corresponding to the rated current of the overload device		N/A
	– The lead our wire is soldered or fixed to the protective screen.		N/A
	Protective screening is not allowed for SMPS with plug connection to the mains (EN 61558-2-16:09)		N/A
BB.19.1.3.5	No connection between output circuit and protective earth, except of associated transformers (allowed by equipment standard) or 19.8 is fulfilled (EN 61558-2-16:09)		N/A
BB.19.1.3.6	No connection between output circuit and body, except of associated transformers (allowed by equipment standard) (EN 61558-2-16:09)		N/A
BB.19.1.3.7	The distance between input and output terminals for the connection of external wiring is ≥ 25 mm		N/A
BB.19.1.3.8	Portable SMPS having an rated output ≤ 630 VA (EN 61558-2-16:09)		N/A
BB.19.1.3.9	No connection between output circuit, and body except of associated transformers (allowed by equipment standard) (EN 61558-2-16:09)		N/A
BB.19.1.3.10	Protective screening is not allowed for SMPS with plug connection to the mains (EN 61558-2-16:09)		N/A
BB.19.11	Handles, levers, knobs, etc.:		N/A
	– insulating material		N/A
	– supplementary insulation covering		N/A
	– separated from shafts or fixing by supplementary insulation		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
BB.19.12	Windings construction		N/A
BB.19.12.1	Undue displacement in all types of transformers not allowed:		N/A
	– of input or output windings or turns thereof		N/A
	– of internal wiring or wires for external connection		N/A
	– of parts of windings or of internal wiring in case of rupture or loosening		N/A
BB.19.12.2	Serrated tape:		N/A
	– distance through insulation according to table 13		N/A
	– one additional layer of serrated tape, and		N/A
	– one additional layer without serration		N/A
	– in case of cheek less bobbins the end turns of each layer shall be prevented from being displaced		N/A
BB.19.12.3 (A1)	Insulated windings wires providing basic, supplementary or reinforced insulation, meet the following requirements:		N/A
	<ul style="list-style-type: none"> • Multi-layer extruded or spirally wrapped insulation, passed the tests of annex K 		N/A
	<ul style="list-style-type: none"> • Basic insulation: two wrapped or one extruded wire 		N/A
	<ul style="list-style-type: none"> • Supplementary insulation: two layers, wrapped or extruded 		N/A
	<ul style="list-style-type: none"> • Reinforced insulation: three layers wrapped or extruded 		N/A
	Spirally wrapped insulation:		N/A
	<ul style="list-style-type: none"> • creepage distances between wrapped layers > cl. 26 _ P1 values 		N/A
	<ul style="list-style-type: none"> • path between wrapped layers sealed, the test voltage of K2 is multiplied with 1,35 		N/A
	<ul style="list-style-type: none"> • test 26.2.3 – Test A, passed for wrapped layers 		N/A
	<ul style="list-style-type: none"> • the finished component pass the electric strength test according to cl. 18.3 		N/A
a)	Insulated winding wire used for basic or supplementary insulation in a wound part:		N/A
	<ul style="list-style-type: none"> • comply with annex K 		N/A
	<ul style="list-style-type: none"> • two layers for supplementary insulation 		N/A
	<ul style="list-style-type: none"> • one layer for basic insulation 		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	<ul style="list-style-type: none"> one layer for mechanical separation between the insulated wires of primary and secondary. This layer fulfils the requirement of basic insulation. 		N/A
b)	Insulated winding wire used for reinforced insulation in a wound part:		N/A
	<ul style="list-style-type: none"> comply with annex K 		N/A
	<ul style="list-style-type: none"> three layers 		N/A
	<ul style="list-style-type: none"> relevant dielectric strength test of 18.3 		N/A
	Where the insulated winding wire is wound:		N/A
	<ul style="list-style-type: none"> upon metal or ferrite cores 		N/A
	<ul style="list-style-type: none"> upon enamelled wire 		N/A
	<ul style="list-style-type: none"> under enamelled wire 		N/A
	<ul style="list-style-type: none"> one layer for mechanical separation between the insulated wires and the core or the enamelled wires is required. This layer fulfils the requirement of basic insulation. 		N/A
	<ul style="list-style-type: none"> both windings shall not touch each other and also not the core. 		N/A
	100 % routine test of Annex K3 of part 1 is fulfilled		N/A
	no creepage distances and clearances for insulated winding wirers		N/A
	for TIW wires values of box 2) c) of table 13, table C.1 and table D.1 of part 1 and of clause 26.106 are not required		N/A
FIW	<u>Transformers which use FIW wire</u>		-
BB 19.12.101 (A1)	Max. class F for transformers which use FIW-wire		N/A
BB 19.12.102 (A1)	FIW wires comply with IEC 60851-5, Ed.4.1; IEC 60317-0-7 and IEC 60317-56, Ed.1.		N/A
	<ul style="list-style-type: none"> other nominal diameter as mentioned in table 19.101 can be calculated with the formula after table 19.111 		N/A
	FIW wire used for basic or supplementary insulation for transformers according 19.1.2 (separating-transformers) of IEC 61558-2-16:		-

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Clause	Requirement + Test	Result - Remark	Verdict

	<ul style="list-style-type: none"> the test voltage of table 8a – part 1, based on the working voltage of basic or supplementary insulation, comply with the min. voltage strength of table 19.111 		N/A
	<ul style="list-style-type: none"> one layer for mechanical separation is located between the insulated wires of primary and secondary. This layer fulfil the requirement of basic insulation 		N/A
	<ul style="list-style-type: none"> between FIW and enamelled wire, no requirements of creepage distances and clearances 		N/A
	<ul style="list-style-type: none"> no touch of FIW and enamelled wires (grad 1, or grad 2 ...) 		N/A
	FIW wire used for double or reinforced insulation for transformers according 19.1.3 (isolating and safety isolating transformers) of IEC 61558-2-16 (PRI and SEC basic insulated FIW-wire):		N/A
	<ul style="list-style-type: none"> the test voltage of table 8a – part 1, based on the working voltage of basic or supplementary insulation, comply with the min. voltage strength of table 19.111 		N/A
	<ul style="list-style-type: none"> for primary and secondary winding FIW-wire for basic insulation is used 		N/A
	<ul style="list-style-type: none"> one layer for mechanical separation is located between the insulated wires of primary and secondary. This layer fulfil the requirement of basic insulation 		N/A
	<ul style="list-style-type: none"> no touch between the basic insulated PRI and SEC FIW-wires 		N/A
	<ul style="list-style-type: none"> between PRI- and SEC-FIW wires, no requirements of creepage distances and clearances 		N/A
	Alternative construction used for reinforced insulation (reinforced insulated FIW wire and enamelled wire)		N/A
	<ul style="list-style-type: none"> the test voltage of table 8a – part 1, based on the working voltage reinforced insulation, comply with the min. voltage strength of table 19.111 		N/A
	<ul style="list-style-type: none"> one layer for mechanical separation is located between the reinforced insulated FIW wire and the enamelled wire. This layer fulfil the requirement of basic insulation 		N/A
	<ul style="list-style-type: none"> no touch between the FIW wire and the enamelled wire 		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	<ul style="list-style-type: none"> between the reinforced FIW wire and any other parts, no requirements of creepage distances and clearances exist 		N/A
	Alternative construction with FIW wires, basic or supplementary insulated for transformers with double or reinforced insulation according to 19.1.3 (basic/supplementary insulated FIW wire + enamelled wire + creepage distance and clearances for basic insulation)		-
	<ul style="list-style-type: none"> the test voltage of table 8a – part 1, based on the working voltage of basic or supplementary insulation, comply with the min. voltage strength of table 19.111 		N/A
	<ul style="list-style-type: none"> PRI or SEC basic insulated FIW wire and to the other winding (enamelled wire) requirements of supplementary insulation 		N/A
	<ul style="list-style-type: none"> creepage distances and clearances between the basic insulated FIW wire and the enamelled wire for basic or supplementary insulation are required. 		N/A
	Where the FIW wire is wound		N/A
	<ul style="list-style-type: none"> upon metal or ferrite cores 		N/A
	<ul style="list-style-type: none"> one layer for mechanical separation between the insulated wires and the core or the enamelled wires is required. This layer fulfils the requirement of basic insulation. 		N/A
	<ul style="list-style-type: none"> both windings shall not touch each other and also not the core. 		N/A
BB.20	COMPONENTS		N/A
BB.21	INTERNAL WIRING		N/A
BB.22	SUPPLY CONNECTION AND EXTERNAL FLEXIBLE CABLES AND CORDS		N/A
BB.23	TERMINALS FOR EXTERNAL CONDUCTORS		N/A
BB.24	PROVISION FOR PROTECTIVE EARTHING		N/A
BB.25	SCREWS AND CONNECTIONS		N/A

BB.26	CREEPAGE DISTANCES AND CLEARANCES		N/A
BB.26.1	See 26.101		N/A
BB.26.2	Creepage distances (cr) and clearances (cr)		N/A
BB.26.2.1	Windings covered with adhesive tape		N/A
	– the values of pollution degree 1 are fulfilled		N/A
	– all isolating material are classified acc. to IEC 60085 and IEC 60216		N/A
	– test A of 26.2.3 is fulfilled		N/A
BB.26.2.2	Uncemented insulating parts pollution degree P2 or P3		N/A
	– all isolating material are classified acc. to IEC 60085 and IEC 60216		N/A
	– values of pollution degree 1 are not applicable		N/A
BB.26.2.3	Cemented insulating parts		N/A
	– all isolating materials are classified acc. to IEC 60085 and IEC 60216		N/A
	– values of distance through insulation (dti) are fulfilled		N/A
	– creepage distances and clearances are not required		N/A
	– test A of this sub clause is fulfilled		N/A
	Test A		N/A
	– thermal class		N/A
	– working voltage		N/A
	– Test with three specially specimens, with un-insulated wires, without impregnation or potting		(see appended table) N/A
	Two of the three specimens are subjected to:		N/A
	– the relevant humidity treatment according to 17.2 (48 h)		N/A
	– the relevant dielectric strength test of 18.3 multiplied with factor 1,35		N/A
	– One of the three specimens is subjected to the relevant dielectric strength test of 18.3 multiplied by the factor 1,35 immediately at the end of the last cycle with high temperature		N/A
	Impulse dielectric test according to 4.1.1.2.1 of IEC 60 664-1 (1,2 / 50 μ s waveform) – see Annex R of IEC 61558-1		N/A
BB.26.2.4	Enclosed parts, by impregnation or potting		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
BB.26.2.4.1	– The requirements of reduced values as stated for pollution degree 1 (P1) are fulfilled		N/A
	– all isolating materials are classified acc. to IEC 60085 and IEC 60216		N/A
	Test B		N/A
	– thermal class		N/A
	– working voltage		N/A
	– Test with three specially specimens, potted or impregnated. The dielectric strength test is applied directly to the joint.	(see appended table)	N/A
	Two of the three specimens are subjected to:		N/A
	– the relevant humidity treatment according to 17.2 (48 h)		N/A
	– the relevant dielectric strength test of 18.3 multiplied with factor 1,25		N/A
	– One of the three specimens is subjected to the relevant dielectric strength test of 18.3 multiplied by the factor 1,25 immediately at the end of the last cycle with high temperature		N/A
	The three spacemen pass the Impulse dielectric test according to 4.1.1.2.1 of IEC 60 664-1 (1,2 / 50 μ s waveform) – see Annex R of IEC 61558-1		N/A
BB.26.2.4.2	– The requirements of distance through insulation (dti) are fulfilled. (P1 values are not required)		N/A
	– all isolating materials are classified acc. to IEC 60085 and IEC 60216		N/A
	Test C		N/A
	– thermal class		N/A
	– working voltage		N/A
	– Test with three specimens, potted or impregnated. (finished components)	(see appended table)	N/A
	– Neither cracks, nor voids in the insulating compounds		N/A
	Two of the three specimens are subjected to:		N/A
	– the relevant humidity treatment according to 17.2 (48 h)		N/A
	– the relevant dielectric strength test of 18.3 multiplied with factor 1,35		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	<ul style="list-style-type: none"> One of the three specimens is subjected to the relevant dielectric strength test of 18.3 multiplied by the factor 1,35 immediately at the end of the last cycle with high temperature 		N/A
	The three spacemen pass the Impulse dielectric test according to 4.1.1.2.1 of IEC 60 664-1 (1,2 / 50 μ s waveform) – see Annex R of IEC 61558-1		N/A
BB.26.3	Distance through insulation		N/A
	For double or reinforced insulation, the required values of Tables 13, C1, and D1 – boxes 2b, 2c and 7 are fulfilled		N/A
	The insulation fulfil the material classification according IEC 60085 or 60216 or the test of 14.3		N/A
BB.26.3.1	Reduced values of the thickness of insulation for supplementary or reinforced insulation are allowed if the following conditions are fulfilled:		N/A
	<ul style="list-style-type: none"> the isolating materials are classified acc. to IEC 60085 and IEC 60216 		N/A
	<ul style="list-style-type: none"> the test of 14.3 is fulfilled 		N/A
	<ul style="list-style-type: none"> If both requirements are fulfilled, the required values for solid insulation can be multiplied by 0,4 		N/A
	<ul style="list-style-type: none"> Minimum thickness of reinforced insulation $\geq 0,2$ mm 		N/A
	<ul style="list-style-type: none"> Minimum thickness of supplementary insulation $\geq 0,1$ mm 		N/A
BB.26.3.2	Insulation in thin sheet form		N/A
	<ul style="list-style-type: none"> If the layers are non-separable (glued together): 		N/A
	<ul style="list-style-type: none"> The requirement of 3 layers is fulfilled 		N/A
	<ul style="list-style-type: none"> The mandrel test according 26.3.3 is fulfilled with 150 N 		N/A
	<ul style="list-style-type: none"> The required values for d.t.i. of Tables 13, C.1 and D.1 – marked by index "e" is fulfilled. 		N/A
	<ul style="list-style-type: none"> If the layers are separated: 		N/A
	<ul style="list-style-type: none"> The requirement of 2 layers is fulfilled 		N/A
	<ul style="list-style-type: none"> If serrated tape is used, 1 additional layer (serrated) and one additional layer without serration is required 		N/A
	<ul style="list-style-type: none"> The mandrel test according 26.3.3 is fulfilled on each layer with 50 N 		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	– The required values for d.t.i. of Tables 13, C.1 and D.1 – marked by index "e" is fulfilled.		N/A
	– If the layers are separated (alternative:		N/A
	- The requirement of 3 layers is fulfilled		N/A
	– If serrated tape is used, 1 additional layer (serrated) and one additional layer without serration is required		N/A
	– The mandrel test according 26.3.3 is fulfilled on 2/3 of the layers with 100 N		N/A
	– The required values for d.t.i. of Tables 13, C.1 and D.1 – marked by index "e" is fulfilled.		N/A
	Test according to 14.3 and if the isolating materials are classified acc. to IEC 60085 and IEC 60216 no distances through insulation are required for insulation in thin sheet form		N/A
	The figures within square brackets in box 2 and 7 of table 13 (C.1/D.1) are used for insulation in thin sheet form as follows:		N/A
	– rated output > 100 VA values in square brackets apply		N/A
	– rated output $\geq 25 \text{ VA} \leq 100 \text{ VA}$ 2/3 of the value in square brackets apply		N/A
	– rated output $\leq 25 \text{ VA}$ 1/3 of the value in square brackets apply		N/A
BB.26.3.3	Mandrel test of insulation in thin sheet form (specimen of 70 mm width are necessary):		N/A
	– If the layers are non-separable – at least 3 layers glued together fulfil the test:		N/A
	– pull force of 150 N		N/A
	– high voltage test of 5,0 kV or the test voltage of 18.3 multiplied by 1,25 whatever is the greater. No flashover, no breakdown.		N/A
	– If the layers are separable and 2/3 of at least 3 layers fulfil the test.		N/A
	– pull force of 100 N		N/A
	– high voltage test of 5,0 kV or the test voltage of 18.3 multiplied by 1,25 whatever is the greater. No flashover, no breakdowns.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	– If the layers are separable 1 of at least 2 layers fulfil the test:		N/A
	– pull force of 50 N		N/A
	– high voltage test of 5,0 kV or the test voltage of 18.3 multiplied by 1,25 whatever is the greater. No flashover, no breakdown.		N/A
BB.26.101	Creepage distances, clearances and distances through insulation, specified values according to (EN 61558-2-16:09):		N/A
	– table 13, material group IIIa (part 1)		N/A
	– table C, material group II (part 1)		N/A
	– table D, material group I (part 1)		N/A
	– working voltage		N/A
	– rated supply frequency 50/60 Hz		N/A
	– rated internal frequency		N/A
	1. Insulation between input and output circuits (basic insulation):		N/A
	a) measured values \geq specified values (mm)		N/A
	2. Insulation between input and output circuits (double or reinforced insulation):		N/A
	a) measured values \geq specified values (mm)		N/A
	b) measured values \geq specified values (mm)		N/A
	c) measured values \geq specified values (mm)		N/A
	3. Insulation between adjacent input circuits: measured values \geq specified values (mm)		N/A
	Insulation between adjacent output circuits: measured values \geq specified values (mm)		N/A
	4. Insulation between terminals for external connection:		N/A
	a) measured values \geq specified values (mm)		N/A
	b) measured values \geq specified values (mm)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	c) measured values \geq specified values (mm)		N/A
	5. Basic or supplementary insulation:		N/A
	a) measured values \geq specified values (mm)		N/A
	b) measured values \geq specified values (mm)		N/A
	c) measured values \geq specified values (mm)		N/A
	d) measured values \geq specified values (mm)		N/A
	e) measured values \geq specified values (mm)		N/A
	6. Reinforced or double insulation: measured values \geq specified values (mm)		N/A
	7. Distance through insulation:		N/A
	a) measured values \geq specified values (mm)		N/A
	b) measured values \geq specified values (mm)		N/A
	c) measured values \geq specified values (mm)		N/A
BB.26.102	Values of IEC 61558-2-16 applicable for frequency up to 3 MHz (EN 61558-2-16:09)		N/A
	For frequency above 3 MHz clause 7 of IEC 60664-4 is applicable (high frequency testing)		N/A
BB.26.103	Clearance (EN 61558-2-16:09)		N/A
	a.) Clearance for frequency \geq 30 kHz according figure 101 two determinations are necessary:		N/A
	– determination based on peak working voltage according Table 104 :		N/A
	Peak working voltage		N/A
	Basic insulation: required / measured		N/A
	Double or reinforced insulation: required / measured value		N/A
	– and alternative if applicable for approximately homogeneous field according to Table 102		N/A
	Peak working voltage		N/A
	Basic insulation: required / measured		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Double or reinforced insulation: required / measured value		N/A
	– determination based on measured r.m.s. working voltage according Tables 13, C1 and D1 (see clause 26.101)		N/A
	The minimum clearance is the greater of the two values.		N/A
	b.) Clearance for frequency ≤ 30 kHz according figure 101 two determinations are necessary:		N/A
	– determination based on peak working voltage with recurring peak voltages according Table 103 :		N/A
	– determination based on measured r.m.s. working voltage according Tables 13, C1 and D1 (see clause 26.101)		N/A
	The minimum clearance is the greater of the two values.		N/A
BB.26.104	The working voltages of Table 102, 103 and 104 are peak voltages including μ sec peaks (EN 61558-2-16:09)		N/A
	The working voltage according to Table 13 of part 1 are r.m.s. voltages		N/A
BB.26.105	Creepage distances		N/A
	Two determinations of creepage distances are necessary (see Figure 102)		N/A
	– determination based on measured peak working voltage according Tables 105 to 110		N/A
	Peak working voltage		N/A
	Pollution degree		N/A
	Basic or supplementary insulation: required / measured		N/A
	Double or reinforced insulation: required / measured value		N/A
	– determination based on measured r.m.s. working voltage according Tables 13, C1 and D1 (see clause 26.101)		N/A
	If the values based on table 105 to 110 are lower than the relevant values in Tables 13, C.1 or D.1, the higher values shall be applicable		N/A
BB.26.106	Distance through insulation (EN 61558-2-16:09)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Instead of partial discharge with high frequency voltage the test of the distance and the calculation of the electric field is applicable under the following conditions:		N/A
	– the max. frequency is < 10 MHz		N/A
	– the field strength approximately comply with Figure 103		N/A
	– no voids or gaps are present in between the solid insulation		N/A
	For thick layers $d1 \geq 0,75$ the peak value of the field strength is ≤ 2 kV/mm		N/A
	For thin layers $d2 \leq 30 \mu\text{m}$ the peak value of the field strength is ≤ 10 kV/mm		N/A
	For $d1 > d > d2$ equation (1) is used for calculation the field strength		N/A
BB.26.107 (A1)	For transformers with FIW wires the following test is required		N/A
	<ul style="list-style-type: none"> • 10 cycles are required 		N/A
	<ul style="list-style-type: none"> • 68 h test at max heating temperature + 10°C or test at max. allowed winding temperature based on the insulation class (required in table 1) + 10°C 		N/A
	<ul style="list-style-type: none"> • 1 h at 25° C 		N/A
	<ul style="list-style-type: none"> • 2 h at 0° C 		N/A
	<ul style="list-style-type: none"> • 1 h at 25° C – (next cycle start again with 68 h max winding temp + 10) 		N/A
	<ul style="list-style-type: none"> • during the 10 cycles test 2 x working voltage is connected between PRI and SEC 		N/A
	<ul style="list-style-type: none"> • after 10 cycle test 2 transformers are subjected to the 17.2 test for 48 h and direct after the 48 h the dielectric strength test of 18.3 (100 % test voltage) is done 		N/A
	<ul style="list-style-type: none"> • after the 10 cycle test the third sample is tested at the end of the last cycle in the hot position with the dielectric strength test of 18.3 (100 % test voltage) 		N/A
	<ul style="list-style-type: none"> • the partial discharge test according to 18.101 is done after the cycling test and after the high voltage test, if the peak working voltage is >750 V 		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

BB.27	RESISTANCE TO HEAT, FIRE AND TRACKING		N/A
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IEC 61558-2-16 Annex BB			
Clause	Requirement + Test	Result - Remark	Verdict
BB.E	ANNEX E , GLOW WIRE TEST		N/A
	The test is required according to IEC 60695-2-10 and IEC 60695-2-11 with the following additions:		N/A
BB.E.1	Clause 6, "Severities" of IEC 6095-2-11, apply with the temperature stated in 27.3 of IEC 61558-1		N/A
BB.E2	Clause 8, "Conditioning", of IEC 60695-2-11 apply, preconditioning is required		N/A
BB.E3	Clause 10, "Test Procedure", of IEC 60695-2-11 apply, The tip of the glow wire is applied to the flat side of the surface.		N/A
BB.F	ANNEX F, REQUIREMENTS FOR MANUALLY OPERATED SWITCHES WHICH ARE PARTS OF THE TRANSFORMER		N/A
BB.H	ANNEX H, ELECTRONIC CIRCUITS (IEC 61558-1)		N/A
BB.K 61558-2-16/A1	ANNEX K, INSULATED WINDING WIRES FOR USE AS MULTIPLE LAYER INSULATION		N/A
BB.K.1	Wire construction:		N/A
	<ul style="list-style-type: none"> insulated winding wire for basic or supplementary insulation (see 19.12.3) 		N/A
	<ul style="list-style-type: none"> insulated winding wire for reinforced insulation (see 19.12.3) 		N/A
	<ul style="list-style-type: none"> solid circular winding wires and stranded winding wires with 0,05 to 5 mm diameter 		N/A
	<ul style="list-style-type: none"> spirally wrapped insulation - overlapping 		N/A
BB.K.2	Type tests		N/A
BB.K.2.1	General Tests between ambient temperature between 15° C and 35° C and at an humidity between 45% and 75 %		N/A
BB K.2.2	Electric strength test		N/A
BB K.2.2.1	Solid circular winding wires and stranded winding wires		N/A
	Test samples prepared according to clause 4.4.1 of IEC 60851-5:2008 (twisted pair)		N/A

IEC 61558-2-16 Annex BB			
Clause	Requirement + Test	Result - Remark	Verdict
	Dielectric strength test: 6 kV for reinforced insulation		N/A
	Dielectric strength test: 3 kV for basic or supplementary insulation		N/A
BB K.2.2.2	Square or rectangular wires .		N/A
	Test samples prepared according to clause 4.7.1 of IEC 60851-5:2008		N/A
	Dielectric strength test: 5,5 kV for reinforced insulation		N/A
	Dielectric strength test: 2,75 kV for basic or supplementary insulation		N/A
BB K.2.3	Flexibility and adherence		N/A
	Claus 5.1 in Test 8 of IEC 60851-3:2009 shall be used		N/A
	Test samples prepared according to clause 5.1.1.4 of IEC 60851-3:2009		N/A
	Dielectric strength test: 5,5 kV for reinforced insulation		N/A
	Dielectric strength test: 2,75 kV for basic or supplementary insulation		N/A
	Mandrel diameter according table K.1		N/A
	The tension to the wire during winding on mandrel is 118 N/mm ² (118 MPa)		N/A
BB.K.2.4	Heat shock		N/A
	Test samples prepared according to 3.1.1 (in Test 9) of IEC 60851-6:1996		N/A
	<ul style="list-style-type: none"> high voltage test immediately after this test 		N/A
	<ul style="list-style-type: none"> Dielectric strength test: 5,5 kV for reinforced insulation 		N/A
	<ul style="list-style-type: none"> Dielectric strength test: 2,75 kV for basic or supplementary insulation 		N/A
BB.K.2.5	Retention of dielectric strength after bending (test as specified under test 13 of 4.6.1 c) of IEC 60 851-5)		N/A
	<ul style="list-style-type: none"> high voltage test immediately after this test 		N/A
	<ul style="list-style-type: none"> Dielectric strength test: 5,5 kV for reinforced insulation 		
	<ul style="list-style-type: none"> Dielectric strength test: 2,75 kV for basic or supplementary insulation 		
BB.K.3	Testing during manufacturing		N/A

IEC 61558-2-16 Annex BB			
Clause	Requirement + Test	Result - Remark	Verdict
BB.K.3.1	General Tests as subjected in K.3.2 and K.3.3		N/A
BB K.3.2	Routine test		N/A
	<ul style="list-style-type: none"> Dielectric strength test: 4,2 kV for reinforced insulation 		N/A
	<ul style="list-style-type: none"> Dielectric strength test: 2,1 kV for basic or supplementary insulation 		N/A
BB K.3.3	Sampling test		N/A
BB K.3.3.1	Solid circular winding wires and stranded winding wires		N/A
	Test with a twisted pair, prepared according clause 4.4.1 of IEC 60851-5:2008		N/A
	<ul style="list-style-type: none"> Dielectric strength test: 6 kV for reinforced insulation 		N/A
	<ul style="list-style-type: none"> Dielectric strength test: 3 kV for basic or supplementary insulation 		N/A
BB K.3.3.2	Square rectangular wire		N/A
	Samples prepared according to clause 4.7.1 of IEC 60851-5:2008		N/A
	<ul style="list-style-type: none"> Dielectric strength test: 5,5 kV for reinforced insulation 		N/A
	<ul style="list-style-type: none"> Dielectric strength test: 3 kV for basic or supplementary insulation 		N/A
BB.U	ANNEX U – INFORMATIVE – OPTIONAL TW – MARKING FOR TRANSFORMERS		N/A
V	ANNEX V, SYMBOLS TO BE USED FOR THERMAL CUT-OUTS		N/A

BB.26.2 TEST A	TABLE: CREEPAGE DISTANCES AND CLEARANCES AND DISTANCES THROUGH INSULATION					N/A
Test with three special prepared specimens with uninsulated wires, without potting or impregnation						
cycles with 2 x working voltage between pri / sec	68 h at the temperature acc. Cl. 14 (min. 85 °C)	1 hour 25 °C	2 hour 0 °C	1 hour 25 °C		
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						

BB.26.2 TEST B	TABLE: CREEPAGE DISTANCES AND CLEARANCES AND DISTANCES THROUGH INSULATION					N/A
Test with three specially prepared specimens with potted – P1 values are required						
cycles with 2 x working voltage between pri / sec	68 h at the temperature acc. Cl. 14 (min. 85 °C)	1 hour 25 °C	2 hour 0 °C	1 hour 25 °C		
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						

BB.26.2 TEST C	TABLE: CREEPAGE DISTANCES AND CLEARANCES AND DISTANCES THROUGH INSULATION					N/A
	Test with three specially prepared specimens with potting (only dti is required)					
cycles with 2 x working voltage between pri / sec	68 h at the temperature acc. Cl. 14 (min. 85 °C)	1 hour 25 °C	2 hour 0 °C	1 hour 25 °C		
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						

BB.26.107 61558-2- 16/A1	TABLE: CREEPAGE DISTANCES AND CLEARANCES AND DISTANCES THROUGH INSULATION					N/A
	Test for transformers, use FIW-wire					
cycles with 2 x working voltage between pri / sec	68 h at the temperature acc. Cl. 14 (min. 85 °C)	1 hour 25 °C	2 hour 0 °C	1 hour 25 °C		
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						

IEC 61558-2-16 Annex BB			
Clause	Requirement + Test	Result - Remark	Verdict
BB 18	TABLE: Dielectric Strength		N/A
Test voltage applied between:		Test potential applied (V)	Breakdown / flashover (Yes/No)
Supplementary information:			

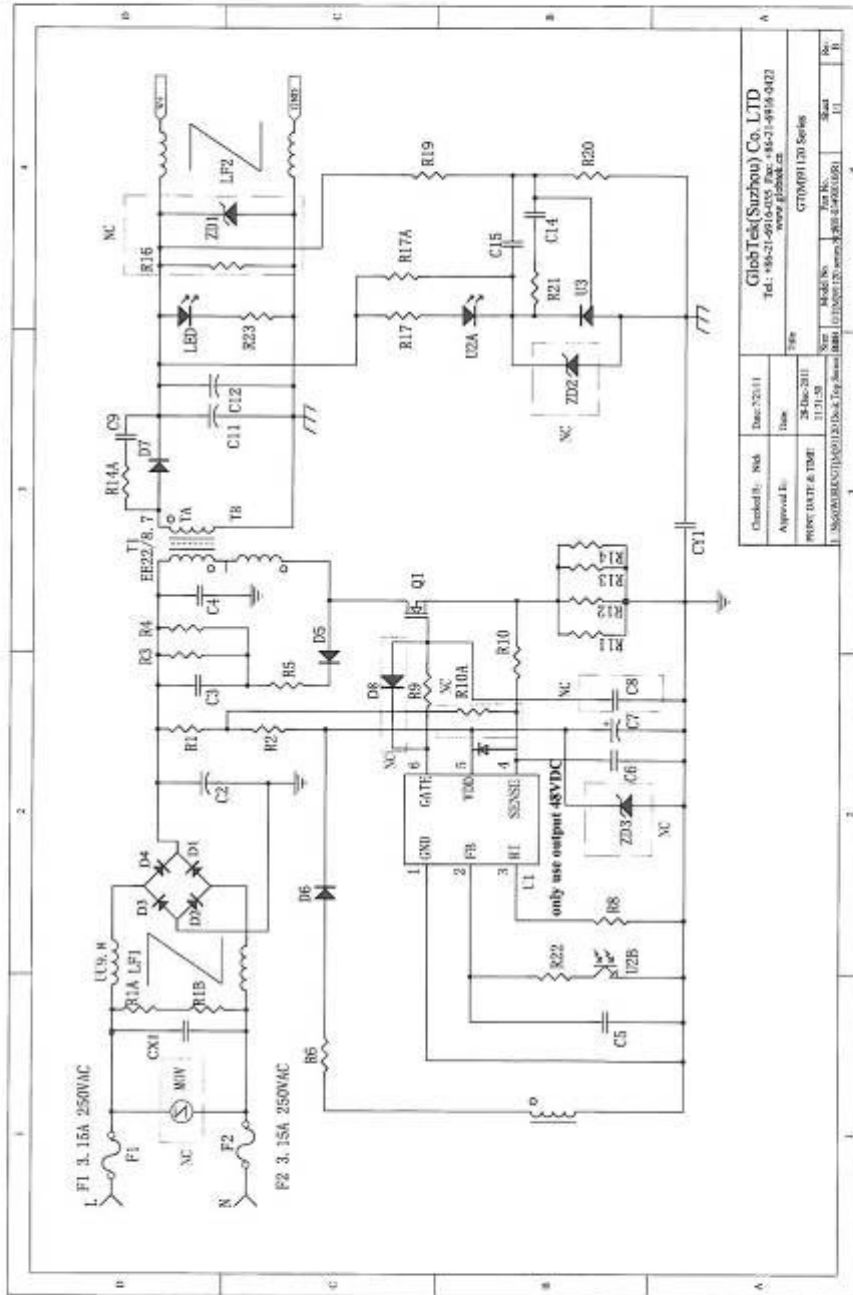
BB 18.3 TABLE: insulation resistance measurements			N/A
Insulation resistance R between:	R (MΩ)	Required R (MΩ)	
Between mains poles (primary fuse disconnected)			
Between parts separated by basic or supplementary insulation			
Between parts separated by double or reinforced insulation			
Supplementary information:			

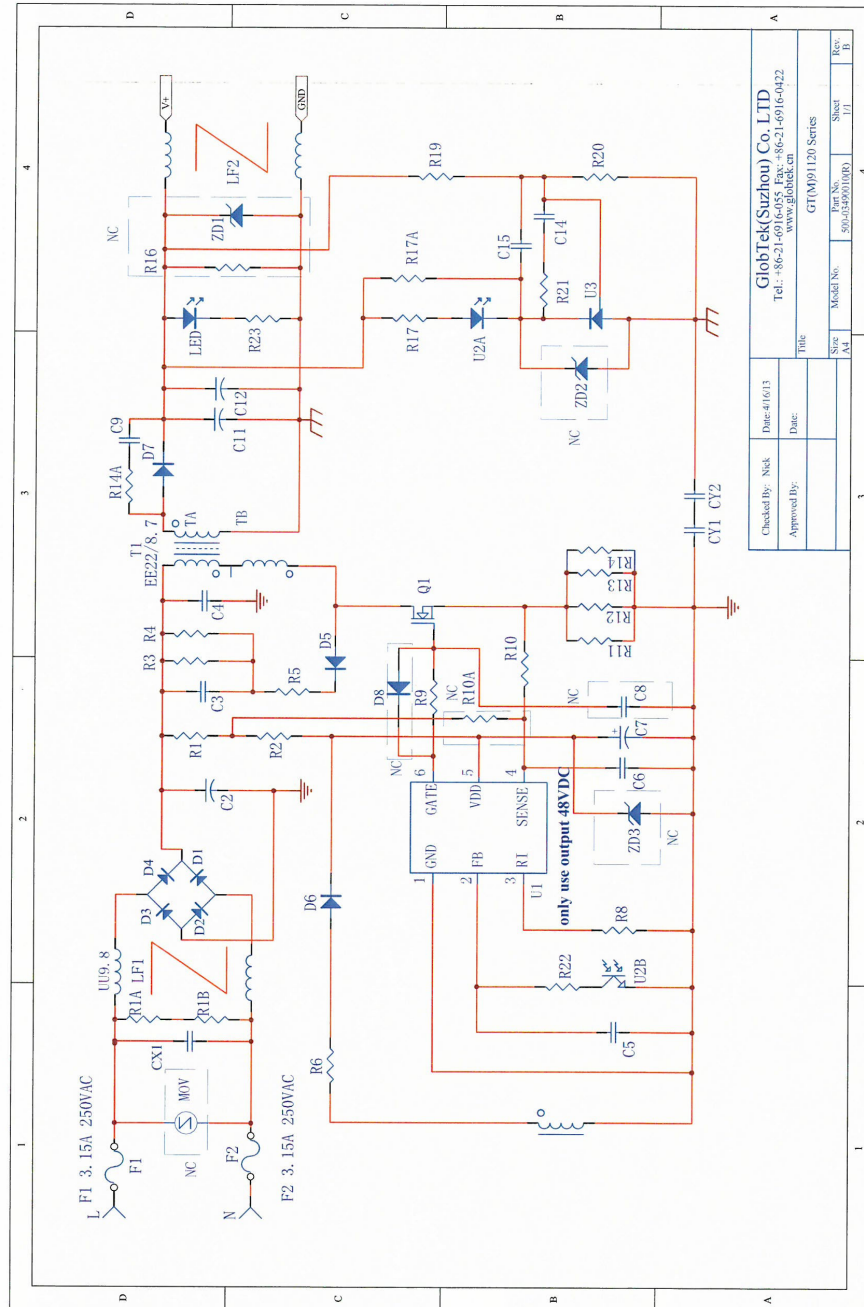
BB 26 TABLE: Clearance And Creepage Distance Measurements						N/A
clearance cl and creepage distance dcr at/of:	Up (V)	U r.m.s. (V)	Required cl (mm)	cl (mm)	required dcr (mm)	dcr (mm)
Supplementary information:						

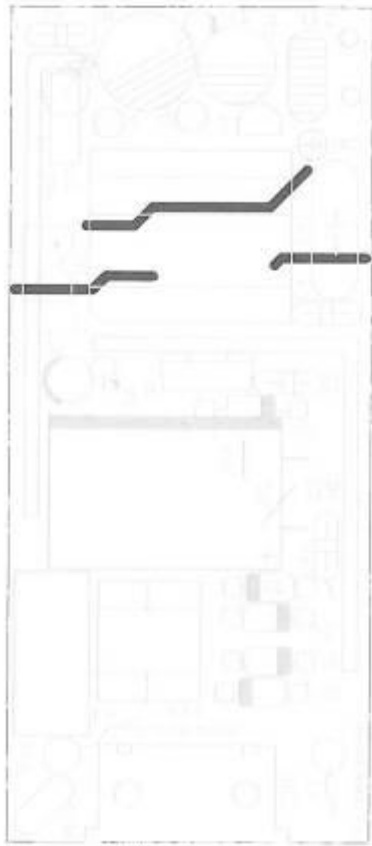
BB 26 TABLE: Distance Through Insulation Measurements				N/A
Distance through insulation di at/of:	U r.m.s. (V)	Test voltage (V)	Required dti (mm)	dti (mm)
Supplementary information:				

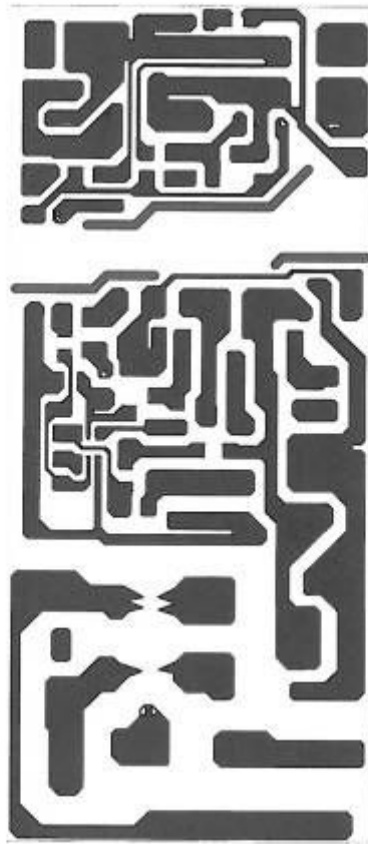
Enclosure No. 1

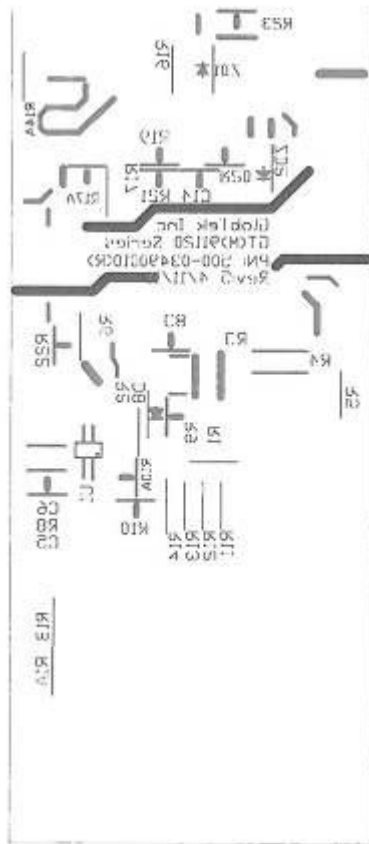
(Technical documentation)

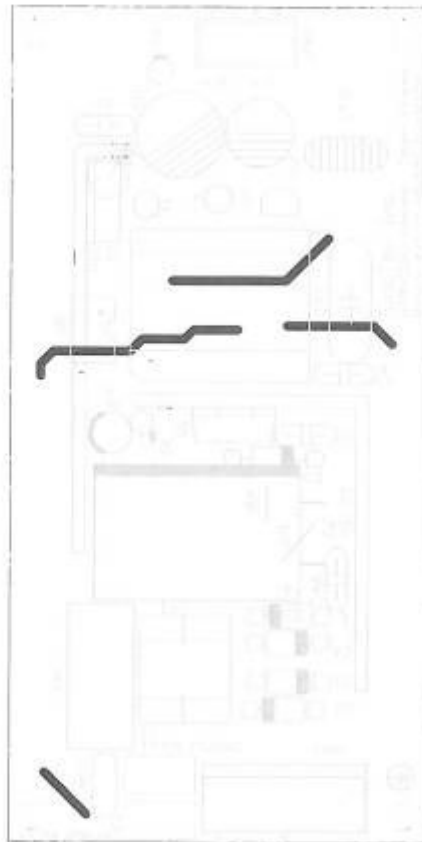


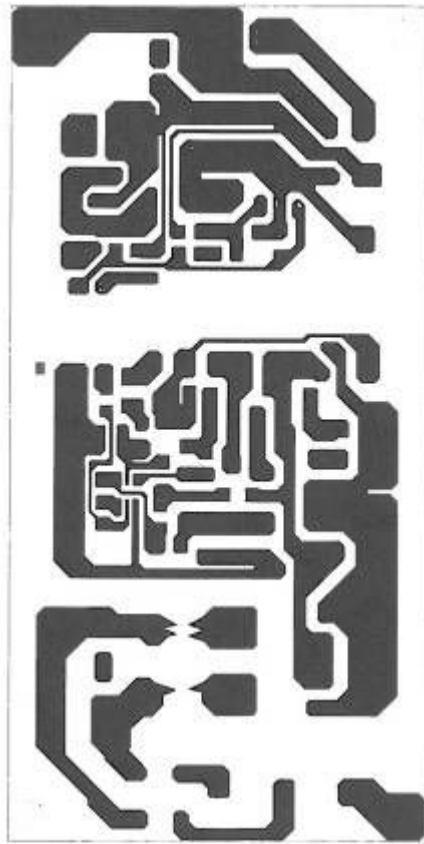


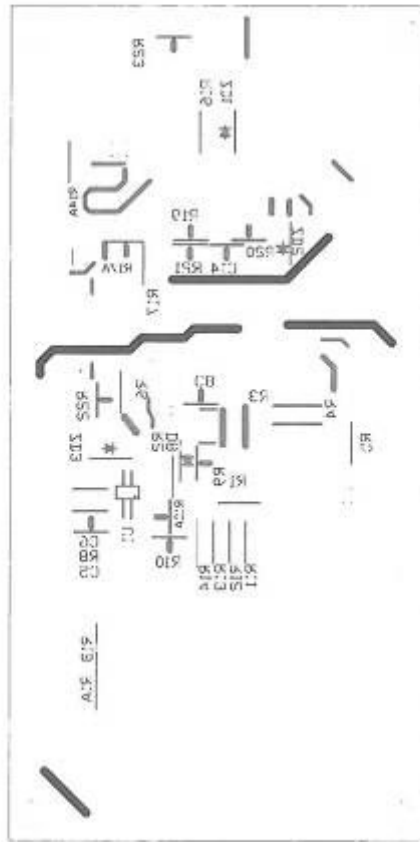


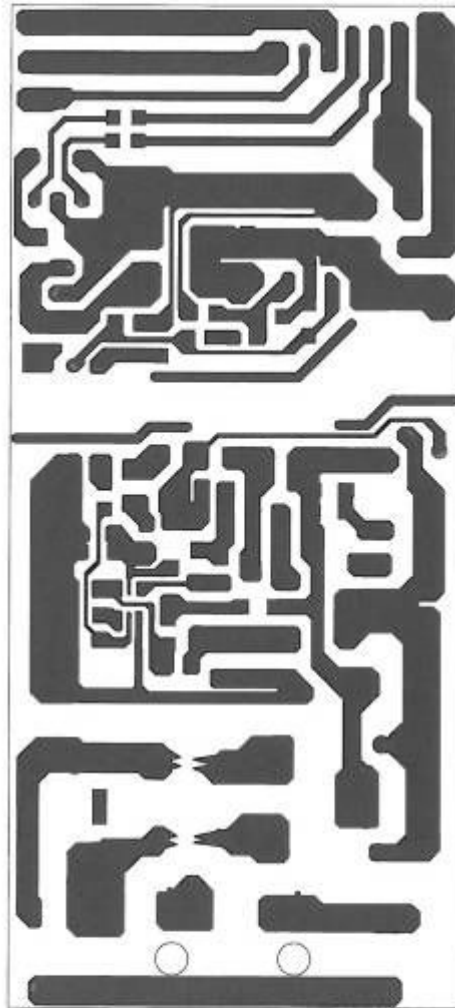


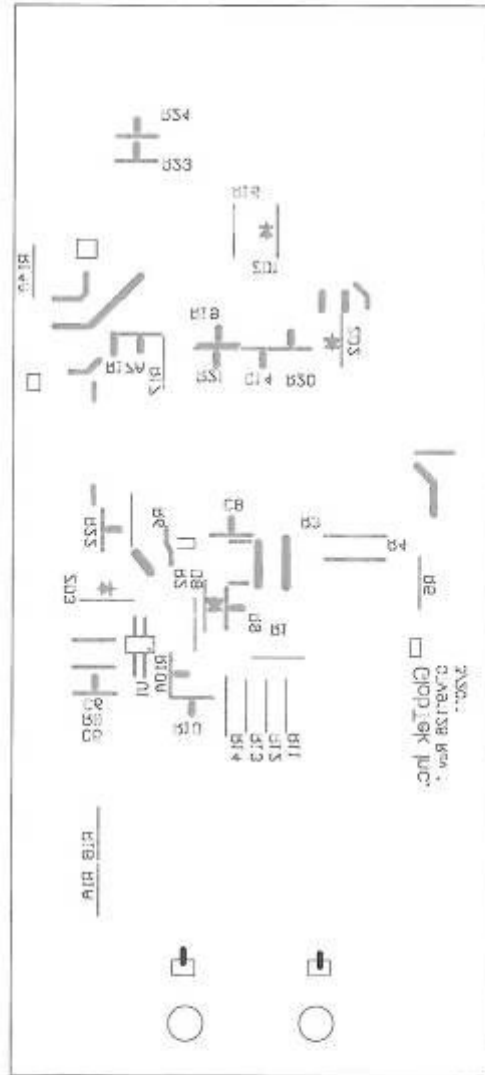


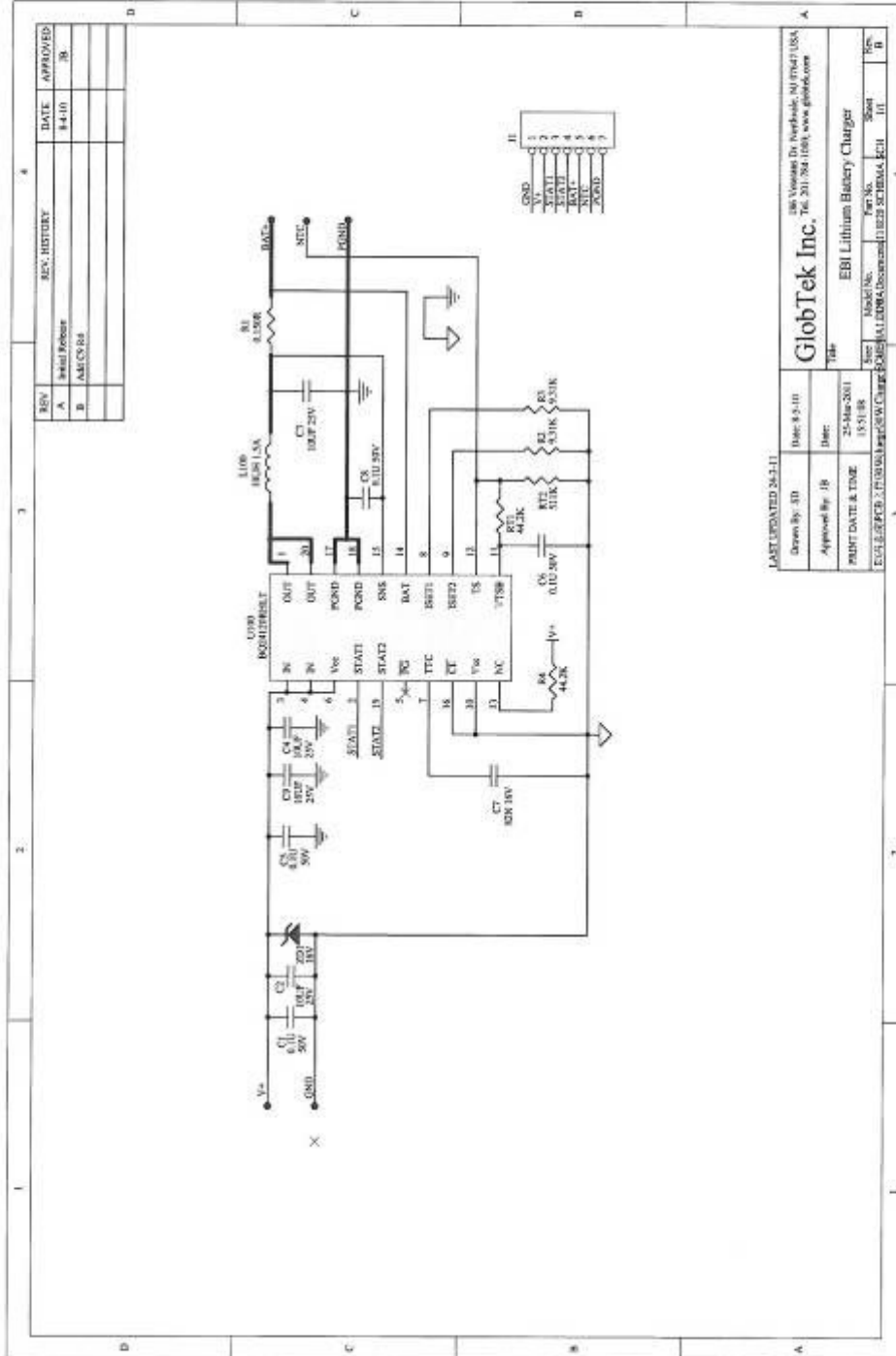


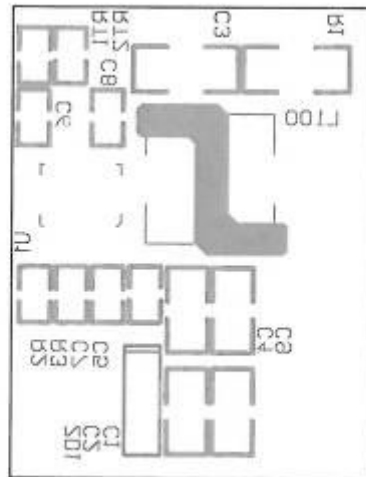


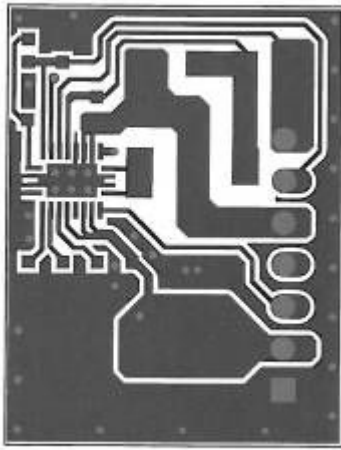


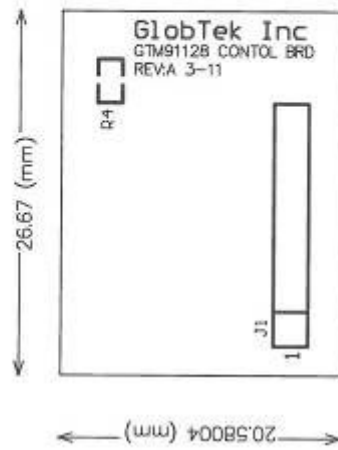




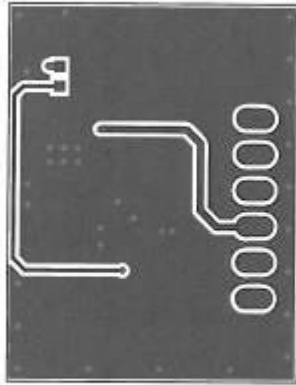


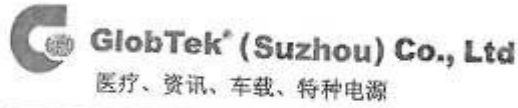






Part No.: PN: GTM91128
 Material: FR4 1.6mm T
 Copper: 2oz. 2 SIDES
 Text Color: White
 PCB MASK COLOR: GREEN
 Tolerance: +/- 0.1(mm)
 REV: A
 Last Updated 3/17/11
 PCB VENDOR: ADD UL APPROVED MANUFACTURER LOGO,
 PCB MATERIAL & FLAMABILITY





零件承认书 Material Approval

制造商: Manufacturer	山东宝岩电气有限公司
供应商: Supplier	山东宝岩电气有限公司
供应商料号: Supplier P/N	320-02859002
名称: Part Name	变压器
品名/规格: SPEC	变压器(Transformer) 5V 900uH GTM91120-30W
GlobTek 料号: GlobTek P/N	320-02859002
版本: Edition No	A.0

PS承认章: Approval Stamp	RD承认章: Approval Stamp	QC承认章: Approval Stamp
	felix 2011/5/14 — 1A 2011.5.14	by 14.5.15

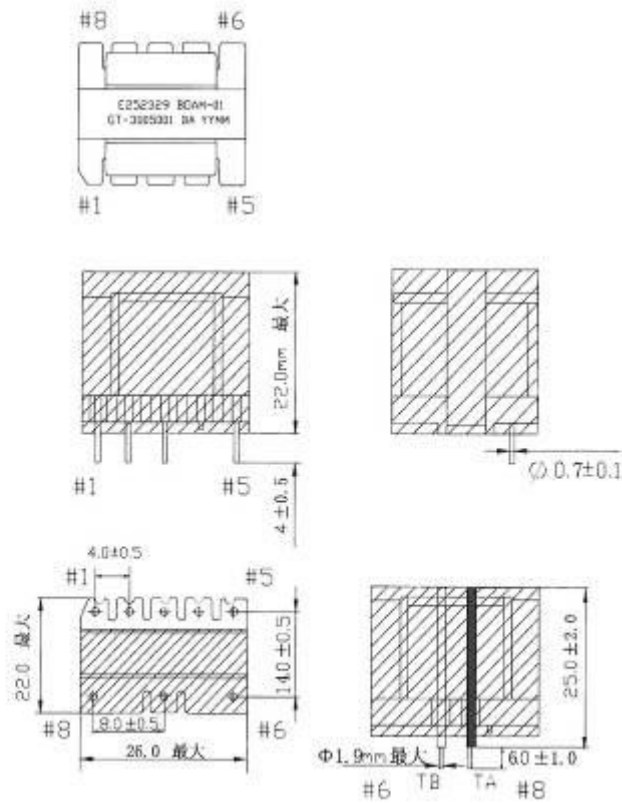
FormNo:GTFMR03003 A.0



SPECIFICATION

CUSTOMER	GLOBTEK(SUZHOU)	PART NAME	TRANSFORMER
MODEL NO.	EE2218W	PART NO.	320-02859002

1 DIMENSION(mm)



SPEC NO.	KF-12032801-A	DATE	2012.03.28	SHEET NO.	1	
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL
1	2012.03.28	TA 和 TB 位置互换	孙小丽	孙小丽	黄丽红	潘秀丽

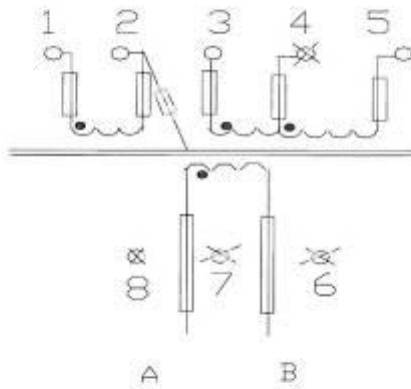
SHANDONG BOAM ELECTRIC CO.,LTD



SPECIFICATION

CUSTOMER	GLOBTEK(SUZHOU)	PART NAME	TRANSFORMER
MODEL NO.	EE2218W	PART NO.	320-02859002

2 EQUIVALENT CIRCUIT (BOTTOM VIEW)



- * THE "λ" MARKS ARE START POINT
- *REMOVE PIN #6, 7, 8
- *CUTTING PIN #4
- * ALL TEFLON TUBE (A: BLACK; B:WHITE)

SPEC NO.	KF-12032801-A	DATE	2012.03.28	SHEET NO.	2		
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL	
				孙小丽	黄丽红	潘秀丽	

SHANDONG BOAM ELECTRIC CO



SPECIFICATION

CUSTOMER	GLOBTEK(SUZHOU)	PART NAME	TRANSFORMER
MODEL NO.	EE2218W	PART NO.	320-02859002

3 ELECTRICAL CHARACTERISTICS

NO.	ITEM	TERMINAL	SPECIFICATION	REMARKS
1	INDUCTANCE	3—5	900 μ H \pm 10%	HIOKI 3531 Z HITESTER (1KHz,0.25V)
2	DIELECTRIC WITHSTAND VOLTAGE	PCOIL—SCOIL	AC 4.0KV 1MINUTE	HPT-50100Z PUNCTURE TESTER: 5mA
		COIL—CORE	AC1.5KV 1MINUTE	

SPEC NO.	KF-12032801-A	DATE	2012.03.28	SHEET NO.	3	
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL
				孙小丽	黄丽红	潘秀丽

SHANDONG BOAM ELECTRIC CO.,LTD



SPECIFICATION

TRANSFORMER	GLOBTEK(SUZHOU)	PART NAME	TRANSFORMER
MODEL NO.	EE2218W	PART NO.	320-02859002

4. WINDING SPECIFICATION

NO	PIN NO. (S-F) S:START, F:FINISH	WIRE	TURNS	WINDING METHOD
W1	(3)-(4)	2UEW Φ 0.35	40	SOLENOID WINDING
INSULATION: POLYESTER TAPE t= 0.025mm, w=9.0mm,1Ts				
W2	(1)-(2)	2UEW Φ 0.19*3	13	SOLENOID WINDING
INSULATION: BROWN TAPE t= 0.025mm, w=9.0mm,2Ts				
W3	(A)-(B)	TEX-E 0.45*4	5	SOLENOID WINDING
INSULATION: POLYESTER TAPE t= 0.025mm, w=9.0mm, 2 Ts				
W4	-(2)	0.05/5.0 mm,COPER+TAPE	0.9	CENTER
INSULATION: POLYESTER TAPE t= 0.025mm, w=9.0mm, 2Ts TAPE: 0.025 × 10.0				
W5	(4)-(5)	2UEW Φ 0.35	20	SOLENOID WINDING
INSULATION: POLYESTER TAPE t= 0.025mm, w=9.0mm, 2Ts				
CORE FIXING :POLYESTER TAPE t= 0.025mm, w=8.5mm, 3Ts				
CORE TAPE:2LAYER POLYESTER TAPE t= 0.025mm, w=28.0mm,LENGTH:45mm				
INSULATION: BROWN TAPE t= 0.05mm, w=17.0mm,2LAYER				

SPEC NO.		DATE	2010.07.20	SHEET NO.	4	
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL
				孙小丽	黄丽红	潘秀丽

SHANDONG BOAM ELECTRIC CO.,LTD



SPECIFICATION

CUSTOMER 客户名称	GLOBTEK(SUZHOU)	PART NAME	TRANSFORMER
MODEL NO. 型号	EE2218W	PART NO.	320-02859002

6. LIST OF MATERIALS

NO.	COMPONENT	MATERIALS	MANUFACTURES	REMARKS
1	CORE	EE2218W PC40	NAN JING JINNING CO.,LTD OR EQUIR	
2	BOBBIN	EE2218W,8PIN PBT-4130	CHANG CHUN PLASTICS CO.,LTD	E59481
3	WIRE	2UEW Φ 0.35	JIANGSU DARTONG M&E CO.,LTD	E237377
		2UEW Φ 0.19	SHANDONG SAINT ELECTRIC CO.,LTD	E194410
		TEX-E Φ 0.45	FURUKAWA ELECTRIC CO.,LTD	E230451
4	INSULATION TAPE	POLYESTER TAPE 0.025×9.0mm 0.025×10.0mm 2LAYER0.025×28.0mm 0.05×17mm	JINGJIANG YAHUA PRESSURESENSITIVE GLUE CO.,LTD	E165111
5	CORE FIXING TAPE	POLYESTER TAPE 0.025×8.5mm		
6	COPPER TAPE	0.05×5.0mm	POONGSAN METAL CO.,LTD or equiv	
7	VARNISH	DVB-2085(*)	NOROO PAINT&COATINGS CO.,LTD	E93947
8	TUBE	PTFE TFL	Great Holding Industrial co.,ltd	E156256

SPEC NO.	KF-12032801-A	DATE	2012.03.28	SHEET NO.	5	
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL
				孙小丽	黄丽红	潘秀丽

SHANDONG BOAM ELECTRIC CO.,LTD

SPECIFICATION

GLOBTEK(SUZHOU)	PART NAME	TRANSFORMER
MODEL NO. EE2218W	PART NO.	320-02859002

QMFZ8.E59481
Plastics Certified for Canada - Component

Additional information regarding this certification can be found in UL's IQ Family of Databases (iq.ul.com).
For additional information concerning the individual material, click on the material designation.

[Page Bottom](#)

Plastics Certified for Canada - Component

See General Information for Plastics Certified for Canada - Component

CHANG CHUN PLASTICS CO LTD E59481
7TH FL.
301 SONGKIANG RD
TAIPEI, 104 TAIWAN

MI Dsg	Color	Min. Thk mm	Flame Class	H			RTI			C
				W	A	V	Elec	Mech	T	
4130(100%Virgin) (a)(b)										
	ALL	0.40	V-0	4	0	-	75	75	75	2
		0.74	V-0	4	0	0	120	120	140	
		1.5	V-0	3	0	0	120	120	140	
		3.0	V-0	2	0	0	120	120	140	

2) WIRE

Magnet Wire - Component

See General Information for Magnet Wire - Component

JIANGSU DARTONG H & E CO LTD E237377
1 DARTONG RD
HUAIJIAN ECONOMY DEVELOPMENT ZONE
HUAIJIAN, JIANGSU 223236 CHINA

MI Dsg	Mark Dsg	Coat Type		ANSI Type	Temp Class
		BC	DC		
BLBW	(1)	Polyurethane	—	MW 79-C	155
				MW 78-C	130
AEIW	(1)	Polyester-imide	—	MW30#	180
				Ø	200
BLEW	UEW/100	Polyurethane	—	MW82	180
AEI/AIW	(1)	Polyester-imide	Polyamide-imide	MW35#, MW73#	200

Magnet Wire - Component

See General Information for Magnet Wire - Component

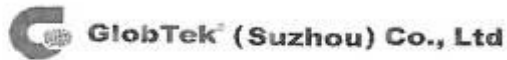
SHANDONG SAINT ELECTRIC CO LTD E194410
YUNZHAN RD
HIGH-TECH DEVELOPING ZONE
MINTAI, SHANDONG 271200 CHINA

MI Dsg	Coat Typ		ANSI Type	TI
	BC	DC		
EIW/AI	Polyester-imide	Polyamide-imide	MW35	200
UEW, QA	Polyurethane	—	MW79	155
EIW	Polyester-imide	—	MW30	180
UEW/100, QA/100, UEW/100 Litz, QA/100 Litz	Polyurethane	—	MW82	180
UEW/155, QA/155, UEW/155 Litz, QA/155 Litz	Polyurethane	—	MW79#	155
UEW/130, QA/130, UEW/130 Litz, QA/130 Litz	Polyurethane	—	MW75#	130

SPEC NO.	KF-12032801-A	DATE	2012.03.28	SHEET NO.	6	
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL
				孙小丽	黄丽红	潘秀丽

SHANDONG BOAM ELECTRIC CO.,LTD

TRF No. IEC61558_2_16B



医疗、资讯、车载、特种电源

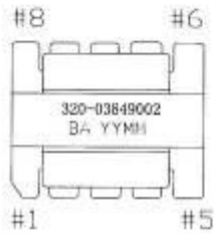
零件承认书 Material Approval		
制造商: Manufacturer		
供应商: Supplier	山东宝岩电气有限公司 SHAN DONG BOAM CO.,LTD	
供应商料号: Supplier P/N	320-03849002	
名称: Part Name	BY-EE2230W01-0F1	
品名/规格: SPEC		
GlobTek料号: GlobTek P/N	320-03849002	
Edition No: 版本	A.0	
作成: Made by	确认: Check	承认: Approval
黄丽红	潘秀丽	孙恩国
PS承认章: Approval Stamp	RD承认章: Approval Stamp	QC承认章: Approval Stamp
	Talon. 2010.6.21 	



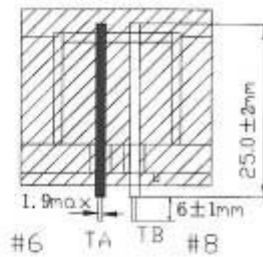
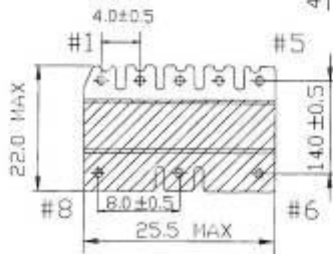
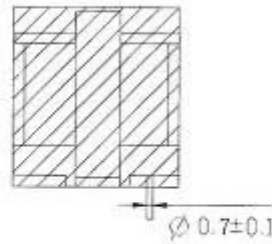
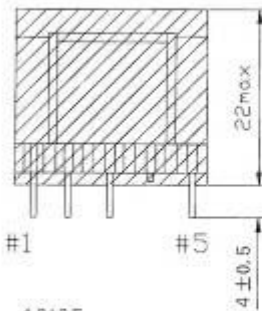
SPECIFICATION

CUSTOMER	环球电气 GLOBTEK(SUZHOU)	PART NAME	TRANSFORMER
MODEL NO.	发行单 EEZ218W	PART NO.	320-03849002

1 DIMENSION(mm)



* MARKING (BLACK)



SPEC NO.	KF-1006090I-A	DATE	2010.06.09	SHEET NO.	1	
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL
	2010.06.17	管脚长 5.0 改 4.0	黄丽红	黄丽红	潘秀丽	孙恩国

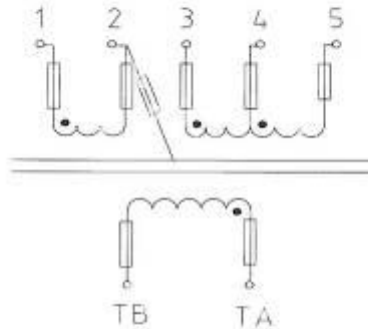
SHANDONG BOAM ELECTRIC CO.,LTD



SPECIFICATION

CUSTOMER	受控文件 GLOBTEK(SUZHOU)	PART NAME	TRANSFORMER
MODEL NO.	发行章 EE2218W	PART NO.	320-03849002

2 EQUIVALENT CIRCUIT (BOTTOM VIEW)



- * THE "⊙" MARKS ARE START POINT
- * REMOVE PIN 6,7,8
- * CUTTING PIN 4
- * ALL TEFLON TUBE (TA; BLACK; TB;WHITE)

3 ELECTRICAL CHARACTERISTICS

NO.	ITEM	TERMINAL	SPECIFICATION	REMARKS
1	INDUCTANCE	3-5	900 μ H \pm 10%	HIOKI 3531 Z HITESTER (1KHz,0.25V)
2	LEAKAGE	3-5 (SEC ALL SHORT)	180 μ H MAX	
3	DIELECTRIC WITHSTAND VOLTAGE	PCOIL—SCOIL	AC 4.0KV 1MINUTE	HPT-50100Z PUNCTURE TESTER: 5mA
		COIL—CORE	AC1.5KV 1MINUTE	

SPEC NO.	KF-10060901-A	DATE	2010.06.09	SHEET NO.	2	
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL
				黄丽红	潘秀丽	孙恩国

SHANDONG BOAM ELECTRIC CO



SPECIFICATION

CUSTOMER		GLOBTEK (SUZHOU)		PART NAME		TRANSFORMER	
MODEL NO.		EE2218W		PART NO.		320-03849002	
4. WINDING SPECIFICATION							
NO	PIN NO. (S-F) S:START, F:FINISH	WIRE	TURNS	WINDING METHOD			
W1	(3)-(4)	2UEW Φ 0.35	40	SOLENOID WINDING			
FIRST LAYER INSULATION $t=0.025\text{mm}$, $w=9\text{mm}$, 1 Ts							
INSULATION: POLYESTER TAPE $t=0.025\text{mm}$, $w=9\text{mm}$, 1 Ts							
W2	(1)-(2)	2UEW Φ 0.19*3	12	SOLENOID WINDING			
INSULATION: POLYESTER TAPE $t=0.025\text{mm}$, $w=9\text{mm}$, 2 Ts							
W3	(TA)-(TB)	TEX Φ 0.45*3	7	SOLENOID WINDING			
INSULATION: POLYESTER TAPE $t=0.025\text{mm}$, $w=9\text{mm}$, 2 Ts							
W4	-(2)	0.05/7.0 mm,COPER+TAPE	0.9	CENTER			
INSULATION: POLYESTER TAPE $t=0.025\text{mm}$, $w=9\text{mm}$, 2Ts							
W5	(4)-(5)	2UEW Φ 0.35	20	SOLENOID WINDING			
INSULATION: POLYESTER TAPE $t=0.025\text{mm}$, $w=9\text{mm}$, 2Ts							
CORE FIXING :POLYESTER TAPE $t=0.025\text{mm}$, $w=8.5\text{mm}$,3 Ts							
CORE TAPE:2LAYER POLYESTER TAPE $t=0.025\text{mm}$, $w=28.0\text{mm}$,LENGTH:45mm							
FLANK OF BOBBIN ROUND TAPE $t=0.05\text{mm}$, $w=20\text{mm}$,2TS							
SPEC NO.		KF-10060901-A		DATE		2010.06.09	
SHEET NO.		3					
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL	
				黄丽红	潘秀丽	孙恩国	

SHANDONG BOAM ELECTRIC CO.,LTD



SPECIFICATION

CUSTOMER	GLOBTEK(SUZHOU)	PART NAME	TRANSFORMER			
MODEL NO.	EE2218W	PART NO.	320-03849002			
2010.6.22 受控文件 发行章 6. LIST OF MATERIALS						
NO.	COMPONENT	MATERIALS	MANUFACTURES	REMARKS		
1	CORE	EE2218W	EQUIR			
2	BOBBIN	PHENOLIC EE2218W,8PIN(5+3)	BAKELITE GESELLDCHAFT MBH OR EQUIR	E61040 (M)		
3	WIRE	2UEW Φ 0.19	DONG YANG ELECTRONICS CO.,LTD OR EQUIR	E102761(S)		
		2UEW Φ 0.35 TEX Φ 0.45	SUZHOU ASIA PACIFIC ELECTRONICS	E214423		
4	INSULATION TAPE	POLYESTER TAPE 0.025×9mm 2LAYER0.025×28.0mm 0.05×20mm	JINGJIANG PRESSURESENSITIVE GLUE FTY OR EQUIR	E165111 (N)		
5	CORE FIXING TAPE	POLYESTER TAPE 0.025×8.5mm				
6	COPPER TAPE	0.05×7.0mm	POONGSAN METAL CO.,LTD or equiv			
7	VARNISH	319-5F	JIANG YIN DENG FENG OR EQUIR			
8	TUBE	TEFLON	SHENZHEN CHANGBAO SPECIAL PLASTIC CO.,LTD OR EQUIR	E180908		
SPEC NO.	KF-10060901-A	DATE	2010.06.09	SHEET NO.	4	
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL
				黄丽红	潘秀丽	孙恩国

SHANDONG BOAM ELECTRIC CO.,LTD



SPECIFICATION

CUSTOMER	2010.6.22 GLOBTEK(SUZHOU)	PART NAME	TRANSFORMER
MODEL NO.	受控文件 发行章 E2218W	PART NO.	320-03849002

* UL YELLOW CARD

1) .BOBBIN

BAKELITE GESELLSCHAFT MBH E61040 (M)
GENNAER STRASSE 2-4 D-5860. ISELOHN-LETMATHE
FED REP GERMANY

Mtl Dsg	Col	Min Trk	UL94 Flame	Elec	Mach with	RTI w/o	H D				
							H W	H A	V T	4 9	C T
Phenolic molding compound(PF), designated "Rutaform" or Bakelite, furnished in the form of pellets or power.							I	I	R	5	I
PF2736	BK	0.81	94V-0	150	150	150	-	-	-	-	
		1.57	94V-0	150	150	150	0	2	0	-	
		3.07	94V-0	150	150	150	0	2	0	5	
		3.07	94V-0	150	150	150	0	2	0	5	

2) WIRE

DONG YANG ELECTRONICS IND. CO., LTD. E102761 (S)
660-1 BANWOL-RI TALAN-EUB Hwasung-GUN
KYUNGGI-DO KOREA

Mtl Dsg	Coat	Type	ANSI type	TI
ALDIW	BC	Polyester-imide	Polyimide-imide	MW25 200
IW		Polyester-imide		MW30 180
KY-IBW		Polyester-imide	Polyamide	MW70 180
NY-PEW		Polyester	Polyimide	MW24 155
NY-PEW(F)		Polyester	Polyimide	MW24 155
NY-UEW		Polyurethane	Polyamide	MW28 180
UEW		Polyurethane		MW15 130

Marking: Company name or "E102761" and material designation of marked designation on package of reel and Recognized Component Mark.

SHANGHAI ASIA PACIFIC ELECTRIC CO LTD E214423
2525 DAYIE RD WUCIAO FENGXIAN 201402 SHANGHAI, CHINA

Mtl Dsg	Coat Type		ANSI Type	Temp Class
	BC	OC		
EIW	Polyester-imide	—	MW30	180
			(#)	200
UEW	Polyurethane	—	MW82	180
			MW79	155#
			MW75	130#
PEW	Polyester	—	MW5	155
PEW/N	Polyester	Nylon	(#)	200
			MW76#	180
			MW24#	155

Non-ANSI type.
Additional consideration is needed before used in system thermal wiring.
Marking: Company name and material designation on package or reel, and Recognized Component Mark.

SPEC NO.	KF-10060901-A	DATE	2010.06.09	SHEET NO.	5	
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL
				黄丽红	潘秀丽	孙恩国

SHANDONG BOAM ELECTRIC CO.,LTD



SPECIFICATION

CUSTOMER	GJOBTEK(SUZHOU)	PART NAME	TRANSFORMER
MODEL NO.	发行章 EE2218W	PART NO.	320-03849002

3) INSULATION TAPE

OANZ2 January 31, 2000
 Insulating Tape - Component
JINGJIANG PRESSURE SENSITIVE GLUE FTY E165111
 86 HENG GANG NORTH RD JINGJIANG, JIANGSU
 214500 CHINA

Nonwoven cloth/polyethylene terephthalate film tape, Cat. No. WF with suffixes, rated 130 C*(a).
 Polyethylene terephthalate film tape, Cat. No. CT with suffixes, rated 130 C*(c).
 Polyethylene terephthalate film tape, Cat. No. PZ with additional suffixes, rated 130 C*(b).
 *Complies with flame retardant requirements when so marked.
 (a) Comparative Tracking Index (CTI)% performance indicates material Group II, PLC=1, CTI equal to or greater than 400 but less than 600 v.
 (b) Comparative Tracking Index (CTI)% performance indicates material Group IIIa, PLC=2, CTI equal to or greater than 250 but less than 400 v.
 (c) Comparative Tracking Index (CTI)% performance indicates material Group I, PLC=0, CTI equal to or greater than 600 v.
 *The CTI test was conducted per IEC 112 and the assigned level is based on the testing of both film and adhesive sides.
 Marking: Company name or E165111 and catalog designation printed on the carton, wrapper or core.
 4/12/2000 Underwriters Laboratories Inc. Card 1 of 2

4) BARRIER TAPE

OANZ2 JULY 19, 1990
 Component - Insulating Tape E92677 (S)

TAE HWA INDUSTRIAL CO
 634 DEUNGCHON-DONG KANGSEO-KU, SEOUL
 157-030 KOREA

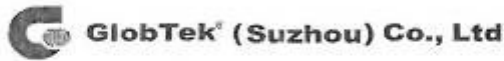
Flame retardant fiberglass cloth tape, Cat. No. TH-GC012
 Flame retardant acetate cloth tape, Cat. No. ST01
 Flame retardant polyester film tape, Cat. No. H-5673
 Marking: Company name or E92677 and Flame Retardant printed on carton wrapper and/or core.

See General Information Preceding These Recognitions.
 *For use only in equipment where the acceptability of the combination is determined by Underwriters Laboratories Inc.
 Reports: November 1, 1984; November 1, 1984; November 1, 1984.

Replaces E92677 dated February 2, 1989.
 358096005 Underwriters Laboratories Inc. D11/0111671 43

SPEC NO.	KF-10060901-A	DATE	2010.06.09	SHEET NO.	6		
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL	
				黄丽红	潘秀丽	孙恩团	

SHANDONG BOAM ELECTRIC CO.,LTD



医疗、资讯、车载、特种电源

零件承认书 Material Approval

制造商: Manufacturer	
供应商: Supplier	山东宝岩电气有限公司 SHAN DONG BOAM CO.,LTD
供应商料号: Supplier P/N	320-02869002
名称: Part Name	BY-EE2230W01-0F2
品名/规格: SPEC	
GlobTek料号: GlobTek P/N	
Edition No: 版本	R0

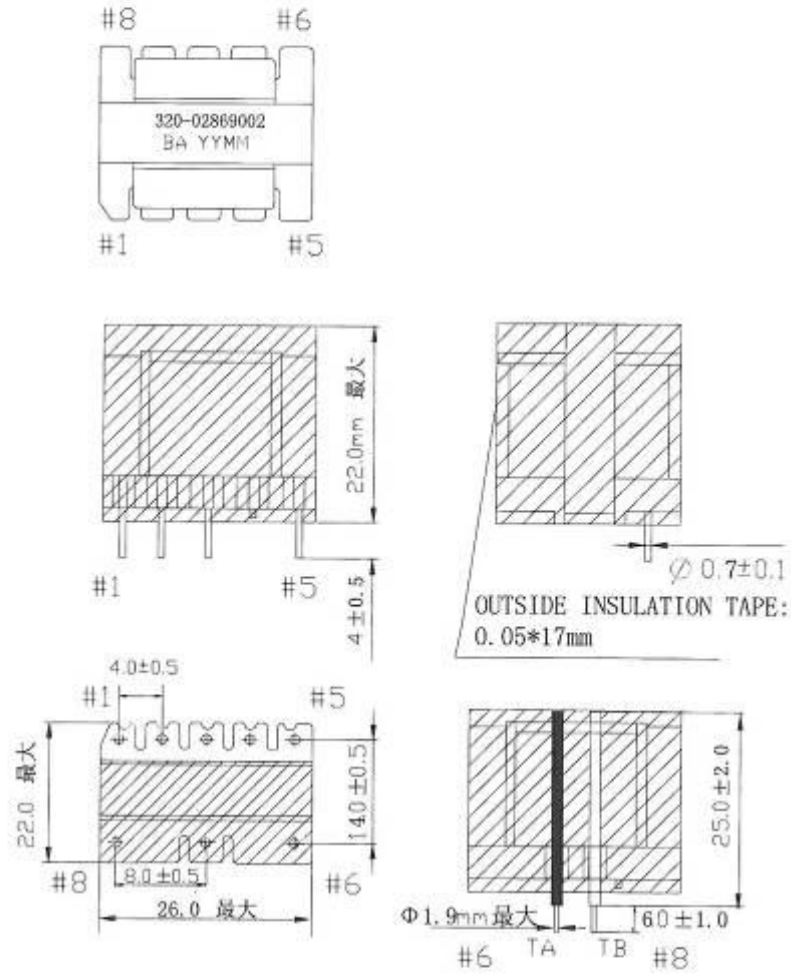
作成: Made by	确认: Check	承认: Approval
PS承认章: Approval Stamp	RD承认章: Approval Stamp <i>Tulun. 2011.1.12</i> 	QC承认章: Approval Stamp



SPECIFICATION

CUSTOMER: GLOBTEK(SUZHOU)	PART NAME: TRANSFORMER
MODEL NO.: EF2218W	PART NO.: 320-02869002

1 DIMENSION(mm)



SPEC NO.	KF-11010101-A	DATE	2011.01.01	SHEET NO.	1	
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL
				孙小丽	潘秀丽	孙恩国

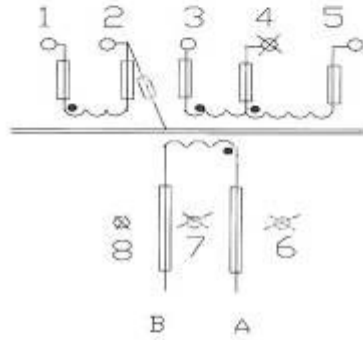
SHANDONG BOAM ELECTRIC CO.,LTD



SPECIFICATION

CUSTOMER	GLOBTEK(SUZHOU)	PART NAME	TRANSFORMER
MODEL NO.	EE2218W	PART NO.	320-02869002

2 EQUIVALENT CIRCUIT (BOTTOM VIEW)



- * THE "λ" MARKS ARE START POINT
- *REMOVE PIN #6, 7, 8
- *CUTTING PIN #4
- * ALL TEFLON TUBE (A: BLACK; B:WHITE)

SPEC NO.	KF-11010101-A	DATE	2011.01.01	SHEET NO.	2		
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL	
				孙小丽	潘秀丽	孙恩国	

SHANDONG BOAM ELECTRIC CO



SPECIFICATION

CUSTOMER: 受控文件 GLOBTEK(SUZHOU)	PART NAME	TRANSFORMER
MODEL NO. 发行章 EE2218W	PART NO.	320-02869002

3 ELECTRICAL CHARACTERISTICS

NO.	ITEM	TERMINAL	SPECIFICATION	REMARKS
1	INDUCTANCE	3—5	900 μ H ± 10%	HIOKI 3531 Z HITESTER (1KHz,0.25V)
2	DIELECTRIC WITHSTAND VOLTAGE	PCOIL—SCOIL	AC 4.0KV 1MINUTE	HPT-50100Z PUNCTURE TESTER; 5mA
		COIL—CORE	AC1.5KV 1MINUTE	

SPEC NO.	KF-11010101-A	DATE	2011.01.01	SHEET NO.	3	
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL
				孙小丽	潘秀丽	孙恩国

SHANDONG BOAM ELECTRIC CO.,LTD



SPECIFICATION

CUSTOMER	GLOBTEK(SUZHOU)	PART NAME	TRANSFORMER			
MODEL NO.2011.1.12	EE2218W	PART NO.	320-02869002			
受控文件 6. LIST OF MATERIALS						
NO.	COMPONENT	MATERIALS	MANUFACTURES	REMARKS		
1	CORE	EE2218W PC40	NAN JING JINNING CO.,LTD OR EQUIR			
2	BOBBIN	PHENOLIC EE2218W,8PIN	WUXI JINGYU ELECTRONIC APPLIANCE CO., LTD	E315032		
3	WIRE	2UEW Φ 0.35	DONG YANG ELECTRONICS CO.,LTD OR EQUIR	E102761(S)		
		2UEW Φ 0.19	SUZHOU ASIA PACIFIC ELECTRONICS	E214423		
		TEX-E Φ 0.60	WUXI JINGYU ELECTRONIC APPLIANCE	E315032		
4	INSULATION TAPE	POLYESTER TAPE 0.025×9.0mm 0.025×12.0mm 2LAYER0.025×28.0mm 0.05×17mm	JINGJIANG PRESSURESENSITIVE GLUE FTY OR EQUIR	E165111 (N)		
5	CORE FIXING TAPE	POLYESTER TAPE 0.025×8.5mm				
6	COPPER TAPE	0.05×7.0mm	TAEHWA INDUSTRIAL CO., LTD OR EQUIR	—		
7	VARNISH	319-5F	JIANG YIN DENG FENG OR EQUIR			
8	TUBE	TEFLON	SHENZHEN CHANGBAO SPECIAL PLASTIC CO.,LTD OR EQUIR	E180908		
SPEC NO.	KF-11010101-A	DATE	2011.01.01	SHEET NO.	5	
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL
				孙小丽	潘秀丽	孙恩国

SHANDONG BOAM ELECTRIC CO.,LTD



SPECIFICATION

CUSTOMER	GLOBTEK(SUZHOU)	PART NAME	TRANSFORMER
MODEL NO.	EE2218W	PART NO.	320-02869002

* UL YELLOW CARD

1) BOBBIN

Component-Plastics

CHANG CHUN PLASTICS CO LTD

		E59481 (S)									
		(C-cont. from B card)									
T-388J	BK	0.62	94V-0	150	150	150	1	0	2	6	3
		0.80	94V-0	150	150	150	1	0	2	6	3
		1.00	94V-0	150	150	150	1	0	2	6	3
T389J	BK, DN	0.79	94HB	150	150	150	1	0	4	7	4
		1.87	94HB	150	150	150	1	0	4	7	4
		3.17	94HB	150	150	150	0	0	4	7	4
T372J	BK, BN	1.00	94V-1	150	150	150	2	0	3	6	4
	NC	1.00	94V-0	150	150	150	2	0	3	6	4
	(a)	2.00	94V-0	150	150	150	1	0	3	6	4
T375J	BK, DN	0.79	94V-0	150	150	150	1	0	4	8	4
		1.88	94V-0	150	150	150	0	0	4	8	4
		3.17	94V-0	150	150	150	0	0	4	8	4
T377J	BK	0.79	94HB	150	150	150	2	0	4	7	4
		1.55	94HB	150	150	150	1	0	4	7	4
		3.17	94HB	150	150	150	0	0	4	7	4

Report: January 6, 1978.

Replaces E59481C dated February 7, 1989.
562854001 N7047 Underwriters Laboratories Inc.®

(Cont. on C1 card)
D1110019282

2) WIRE

DONG YANG ELECTRONICS IND. CO., LTD.
660-1 HANWOL-RŌ TAIAN-EUB HWASUNG-GUN
KYUNGGI-DO KOREA

E102761 (S)

Mat Dsg	IC	Coat Typ	OC	ANSI Type	TI
ALEIW	Polyester-imide			MW35	200
IW	Polyester-imide			MW30	190
NY-EIW	Polyester-imide			MW70	190
NY-PEW	Polyester			MW24	155
NY-PEWF1	Polyester			MW24	155
NY-UW	Polyurethane			MW25	130
UW	Polyurethane			MW15	130

Marking: Company name or "E102761" and material designation of marked designation on package of reel and Recognized Component Mark.

SHANGHAI ASIA PACIFIC ELECTRIC CO LTD E214423
2525 DAYIE RD WUCIAO FENGXIAN 201402 SHANGHAI, CHINA

Mat Dsg	Coat Type		ANSI Type	Temp Class
	IC	OC		
EIW	Polyester-imide	—	MW30	180
			(*)	200
UW	Polyurethane	—	MW82	180
			MW79	155#
			MW75	130#
PEW	Polyester	—	MW5	155
PEW/N	Polyester	Nylon	(*)	200
			MW76#	180
			MW24#	155

(*) Non ANSI Type.

Additional consideration is needed before used in system thermal aging.
Marking: Company name and material designation on package or reel, and Recognized Component Mark.

SPEC NO.	KF-11010101-A	DATE	2011.01.01	SHEET NO.	6		
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL	
				孙小丽	潘秀丽	孙恩国	

SHANDONG BOAM ELECTRIC CO.,LTD



SPECIFICATION

CUSTOMER 受控文件 及印章	GLOBTEK(SUZHOU)	PART NAME	TRANSFORMER
MODEL NO.	EE2218W	PART NO.	320-02869002

3) INSULATION TAPE

OANZ2 January 31, 2000
 Insulating Tape - Component
JINGJIANG PRESSURE SENSITIVE GLUE FTY E165111
 86 HENG GANG NORTH RD JINGJIANG, JIANGSU
 214500 CHINA

Nonwoven cloth/polyethylene terephthalate film tape. Cat. No. WF with suffixes, rated 130 C*(a).
 Polyethylene terephthalate film tape. Cat. No. CT with suffixes, rated 130 C*(c).
 Polyethylene terephthalate film tape. Cat. No. PZ with additional suffixes, rated 130 C*(b).
 *Complies with flame retardant requirements when so marked.
 (a) Comparative Tracking Index (CTI)% performance indicates material Group II, PLC=1, CTI equal to or greater than 400 but less than 600 v.
 (b) Comparative Tracking Index (CTI)% performance indicates material Group IIIa, PLC=2, CTI equal to or greater than 250 but less than 400 v.
 (c) Comparative Tracking Index (CTI)% performance indicates material Group I, PLC=0, CTI equal to or greater than 600 v.
 %The CTI test was conducted per IEC 112 and the assigned level is based on the testing of both film and adhesive sides.
 Marking: Company name or E165111 and catalog designation printed on the carton wrapper or core.

4/12/2000 Underwriters Laboratories Inc. Card 1 of 2

4) BARRIER TAPE

OANZ2 JULY 19, 1990
 Component - Insulating Tape E92677 (S)

TAE HWA INDUSTRIAL CO
 634 DEUNGCHON-DONG KANGSEO-KU, SEOUL
 157-030 KOREA

Flame retardant fiberglass cloth tape, Cat No. TH-GC012
 Flame retardant acetate cloth tape, Cat No. 6701
 Flame retardant polyester film tape, Cat No. H-5673
 Marking: Company name or E92677 and Flame Retardant printed on carton wrapper and/or core.

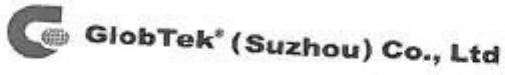
See General Information Preceding These Recognitions.
 For use only in equipment where the acceptability of the combination is determined by Underwriters Laboratories Inc.

Reports: November 1, 1984; November 1, 1984; November 1, 1984.

Replaces E92677 dated February 2, 1989.
 358096005 Underwriters Laboratories Inc. 011/0111671 43

SPEC NO.	KF-11010101-A	DATE	2011.01.01	SHEET NO.	7		
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL	
				孙小丽	潘秀丽	孙恩国	

SHANDONG BOAM ELECTRIC CO.,LTD



医疗、资讯、车载、特种电源

零件承认书 Material Approval		
制造商: Manufacturer		
供应商: Supplier	山东宝岩电气有限公司 SHAN DONG BOAM CO.,LTD	
供应商料号: Supplier P/N	320-02879002	
名称: Part Name	BY-EE2230W01-0F3	
品名/规格: SPEC		
GlobTek料号: GlobTek P/N		
Edition No: 版本	B0	
作成: Made by	确认: Check	承认: Approval
PS承认章: Approval Stamp	RD承认章: Approval Stamp <i>Talon. 2011.1.21</i> <i>[Signature]</i>	QC承认章: Approval Stamp

SPECIFICATION

GLOBTEK(SUZHOU)	PART NAME	TRANSFORMER
MODEL NO. EE2218W	PART NO.	320-02879002

1 DIMENSION(mm)

Technical drawings showing dimensions and part numbers (#1, #5, #6, #8) for the transformer. Key dimensions include: 22.0mm (height), 4.0±0.5 (width), 140±0.5 (width), 25.5 (width), 250±2.0 (height), 60±1.0 (width), and Ø1.9mm (hole diameter).

SPEC NO.	KF-10111601-A	DATE	2010.11.25	SHEET NO.	1	
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL
				黄丽红	潘秀丽	孙恩国

SHANDONG BOAM ELECTRIC CO.,LTD

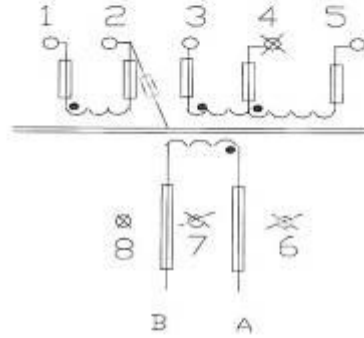
TRF No. IEC61558_2_16B



SPECIFICATION

CUSTOMER	SUOBTEK(SUZHOU)	PART NAME	TRANSFORMER
MODEL NO.	EE2218W	PART NO.	320-02879002

2 EQUIVALENT CIRCUIT (BOTTOM VIEW)



- * THE "λ" MARKS ARE START POINT
- * REMOVE PIN #6, 7, 8
- * CUTTING PIN #4
- * ALL TEFLON TUBE (A: BLACK; B: WHITE)

SPEC NO.	KF-10111601-A	DATE	2010.11.25	SHEET NO.	2	
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL
				黄丽红	潘秀丽	孙恩国

SHANDONG BOAM ELECTRIC CO



SPECIFICATION

CUSTOMER	24 GLOBTEK(SUZHOU)	PART NAME	TRANSFORMER			
MODEL	EE2218W	PART NO.	320-02879002			
发行章 3 ELECTRICAL CHARACTERISTICS						
NO.	ITEM	TERMINAL	SPECIFICATION	REMARKS		
1	INDUCTANCE	3—5	900 μ H ± 10%	HIOKI 3531 Z HITESTER (1KHz,0.25V)		
2	DIELECTRIC WITHSTAND VOLTAGE	PCOIL—SCOIL	AC 4.0KV 1MINUTE	HPT-50100Z PUNCTURE TESTER: 5mA		
		COIL—CORE	AC1.5KV 1MINUTE			
SPEC NO.	KF-10111601-A	DATE	2010.11.25	SHEET NO.	3	
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL
				黄丽红	潘秀丽	孙恩图

SHANDONG BOAM ELECTRIC CO.,LTD



SPECIFICATION

CUSTOMER: 24 GLOBTEK(SUZHOU)		PART NAME		TRANSFORMER		
MODEL NO. 零件文件 EE2218W		PART NO.		320-02879002		
4. WINDING SPECIFICATION						
NO	PIN NO. (S-F) S:START, F:FINISH	WIRE	TURNS	WINDING METHOD		
W1	(3)-(4)	2UEW Φ 0.35	40	SOLENOID WINDING		
INSULATION: POLYESTER TAPE t= 0.025mm, w=9.0mm, 1Ts						
W2	(1)-(2)	2UEW Φ 0.19*3	12	SOLENOID WINDING		
INSULATION: BROWN TAPE t= 0.025mm, w=9.0mm, 2Ts						
W3	(A)-(B)	TEX-E 0.40*2	12	SOLENOID WINDING		
INSULATION: POLYESTER TAPE t= 0.025mm, w=9.0mm, 2 Ts						
W4	—(2)	0.05/7.0 mm,COPER+TAPE	0.9	CENTER		
INSULATION: POLYESTER TAPE t= 0.025mm, w=9.0mm, 2Ts TAPE: 0.025×12.0						
W5	(4)-(5)	2UEW Φ 0.35	20	SOLENOID WINDING		
INSULATION: POLYESTER TAPE t= 0.025mm, w=9.0mm, 2Ts						
CORE FIXING :POLYESTER TAPE t= 0.025mm, w=8.5mm, 3Ts						
CORE TAPE:2LAYER POLYESTER TAPE t= 0.025mm, w=28.0mm,LENGTH:45mm						
INSULATION: TAPE t= 0.05mm, w=17.0mm,2LAYER						
SPEC NO.		DATE	2010.07.20	SHEET NO.	4	
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL
				黄丽红	潘秀丽	孙恩国

SHANDONG BOAM ELECTRIC CO.,LTD



SPECIFICATION

CUSTOMER NO. 客户文件	GLOBTEK(SUZHOU)	PART NAME	TRANSFORMER
MODEL NO. 发行章	EE2218W	PART NO.	320-02879002

6. LIST OF MATERIALS

NO.	COMPONENT	MATERIALS	MANUFACTURES	REMARKS
1	CORE	EE2218W PC40	NAN JING JINNING CO.,LTD OR EQUIR	
2	BOBBIN	PHENOLIC EE2218W,8PIN	CHUANG CHUN PLASTICS CO., LTD	E59481(S)
3	WIRE	2UEW Φ 0.35	DONG YANG ELECTRONICS CO.,LTD OR EQUIR	E102761(S)
		2UEW Φ 0.19	SUZHOU ASIA PACIFIC ELECTRONICS	E214423
		TEX-E Φ 0.40	WUXI JINGYU ELECTRONIC APPLIANCE	E315032
4	INSULATION TAPE	POLYESTER TAPE 0.025×9.0mm 0.025×12.0mm 2LAYER0.025×28.0mm 0.05×17mm	JINGJIANG PRESSURESENSITIVE GLUE FTY OR EQUIR	E165111(N)
5	CORE FIXING TAPE	POLYESTER TAPE 0.025×8.5mm		
6	COPPER TAPE	0.05×7.0mm	TAEHWA INDUSTRIALCO. LTD	-
7	VARNISH	319-5F	JIANG YIN DENG FENG OR EQUIR	
8	TUBE	TEFLON	SHENZHEN CHANGBAO SPECIAL PLASTIC CO.,LTD OR EQUIR	E180908

SPEC NO.	KF-10111601-A	DATE	2010.11.25	SHEET NO.	7	
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL
				黄丽红	潘秀丽	孙恩国

SHANDONG BOAM ELECTRIC CO.,LTD



SPECIFICATION

CUSTOMER	LOBTEK(SUZHOU)	PART NAME	TRANSFORMER
MODEL NO.	EE2218W	PART NO.	320-02879002

2011.11.24
受控文件
发行章

***UL YELLOW CARD**

1) **BOBBIN**

Component-Plastics

CHANG CHUN PLASTICS CO LTD **E59481 (S)**

		(C-cont. from B card)									
T-355J	BK	0.62	94V-0	150	150	150	1	0	2	6	3
		0.80	94V-0	150	150	150	1	0	2	6	3
		1.00	94V-0	150	150	150	1	0	2	6	3
T359J	BK, BN	0.75	94HB	150	150	150	1	0	4	7	4
		1.57	94HD	150	150	150	1	0	4	7	4
		3.17	94HB	150	150	150	0	0	4	7	4
T373J	BK, BN	1.00	94V-1	150	150	150	2	0	3	6	4
	NC	1.00	94V-0	150	150	150	2	0	3	6	4
	(B)	2.00	94V-0	150	150	150	1	0	3	6	4
T376J	BK, BN	0.75	94V-0	150	150	150	1	0	4	5	4
		1.55	94V-0	150	150	150	0	0	4	5	4
		3.17	94V-0	150	150	150	0	0	4	5	4
T377J	BK	0.75	94HD	150	150	150	3	0	4	7	4
		1.55	94HD	150	150	150	1	0	4	7	4
		3.17	94HD	150	150	150	0	0	4	7	4

Report: January 6, 1976.

Replaces E59481C dated February 7, 1989. (Cont. on C1 card)
262854001 N7047 Underwriters Laboratories Inc.® D11/0018985

2) **WIRE**

DONG YANG ELECTRONICS IND. CO., LTD. **E102761 (S)**
 600-1 BANWOL-RU TAIAN-EUB Hwasung-Gun
 KYUNGGI-DO KOREA

Mat. Dsg.	IC	Coat. Typ	OC	ANSI Type	TI
ALB/W	Polyester-imide		Polyamide-imide	MW35	200
FW	Polyester-imide			MW30	180
KV-B/W	Polyester-amide		Polyamide	MW70	180
	-imide				
NY-PEW	Polyester		Polyamide	MW24	155
NY-PEW(F)	Polyester		Polyamide	MW24	155
NY-UEW	Polyurethane		Polyamide	MW25	130
UEW	Polyurethane			MW15	130

Marking: Company name or "E102761" and material designation of marked designation on package of reel and Recognized Component Mark.

SHANGHAI ASIA PACIFIC ELECTRIC CO LTD **E214423**
 2525 DAYIE RD WUCIAO FENGXIAN 201402 SHANGHAI, CHINA

Mat Dsg	Coat. Type		ANSI Type	Temp Class
	BC	OC		
EW	Polyester-imide	—	MW30	180
			(B)	200
UEW	Polyurethane	—	MW82	180
			MW79	155#
			MW75	130#
PEW	Polyester	—	MW5	155
PEW/N	Polyester	Nylon	(B)	200
			MW76#	180
			MW24#	155

Non-ANSI type.
 # Additional consideration is needed before used in system thermal aging.
 Marking: Company name and material designation on package or reel, and Recognized Component Mark.

SPEC NO.	KF-10111601-A	DATE	2010.11.25	SHEET NO.	8	
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL
				黄丽红	潘秀丽	孙恩国

SHANDONG BOAM ELECTRIC CO.,LTD



SPECIFICATION

CUSTOMER	GLOBTEK(SUZHOU)	PART NAME	TRANSFORMER
MODEL NO.	EE2218W	PART NO.	320-02879002

3) INSULATION TAPE

QANZ2 January 31, 2000
 Insulating Tape - Component
 JINGJIANG PRESSURE SENSITIVE GLUE FTY
 86 HENG GANG NORTH RD JINGJIANG, JIANGSU
 214500 CHINA E165111

Nonwoven cloth/polyethylene terephthalate film tape. Cat. No. WF with suffixes, rated 130 C*(a).
 Polyethylene terephthalate film tape, Cat. No. CT with suffixes, rated 130 C*(c).
 Polyethylene terephthalate film tape, Cat. No. PZ with additional suffixes, rated 130 C*(b).
 *Complies with flame retardant requirements when so marked.
 (a) Comparative Tracking Index (CTI)% performance indicates material Group II, PLC=1, CTI equal to or greater than 400 but less than 600 v.
 (b) Comparative Tracking Index (CTI)% performance indicates material Group IIIa, PLC=2, CTI equal to or greater than 250 but less than 400 v.
 (c) Comparative Tracking Index (CTI)% performance indicates material Group I, PLC=0, CTI equal to or greater than 600 v.
 %The CTI test was conducted per IEC 112 and the assigned level is based on the testing of both film and adhesive sides.
 Marking: Company name or E165111 and catalog designation printed on the carton, wrapper or core.
 4/12/2000 Underwriters Laboratories Inc. Card 1 of 2

4) BARRIER TAPE

QANZ2 JULY 19, 1990
 Component - Insulating Tape E92677 (S)

TAE HWA INDUSTRIAL CO
 634 DEUNGCHON-DONG KANGSEO-KU, SEOUL
 157-030 KOREA

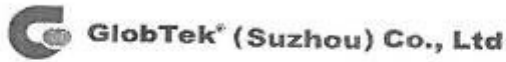
Flame retardant fiberglass cloth tape, Cat. No. TH-GC012
 Flame retardant acetate cloth tape, Cat. No. 6701
 Flame retardant polyester film tape, Cat. No. H-5673
 Marking: Company name or E92677 and Flame Retardant printed on carton wrapper and/or core.

See General Information Preceding These Recognitions.
 For use only in equipment where the acceptability of the combination is determined by Underwriters Laboratories Inc.
 Reports: November 1, 1984; November 1, 1984, November 1, 1984.

Replaces E92677 dated February 2, 1989.
 356066005 Underwriters Laboratories Inc. 011/0111671 43

SPEC NO.	KF-10111601-A	DATE	2010.11.25	SHEET NO.	9	
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL
				黄丽红	潘秀丽	孙恩国

SHANDONG BOAM ELECTRIC CO.,LTD



医疗、资讯、车载、特种电源

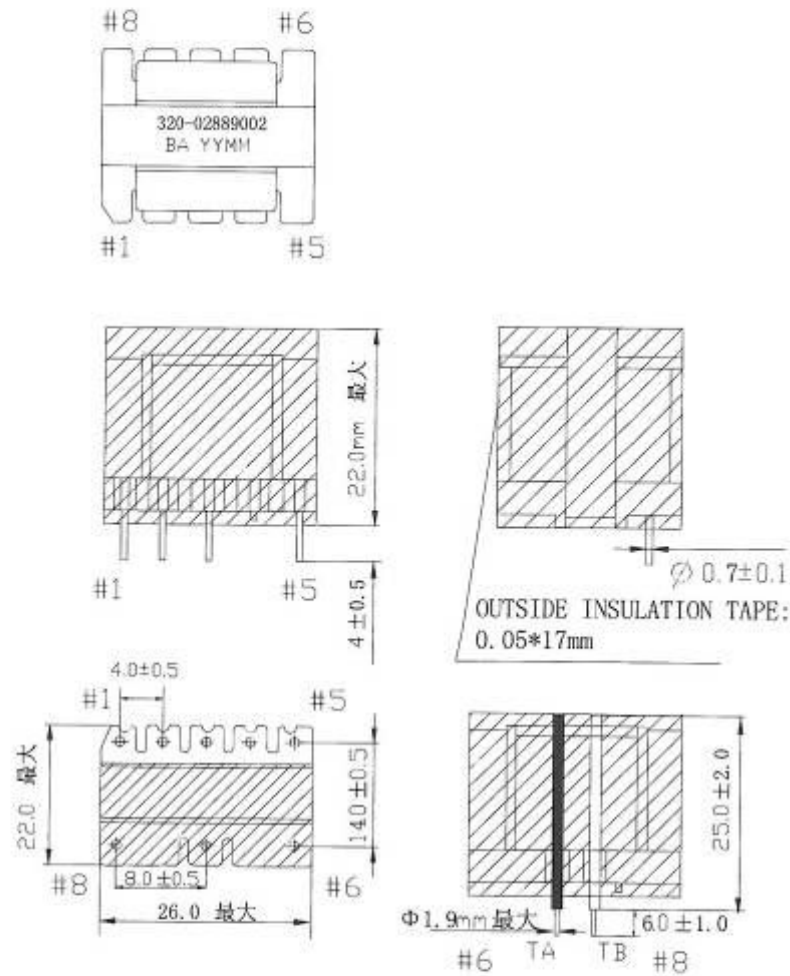
零件承认书 Material Approval		
制造商: Manufacturer		
供应商: Supplier	山东宝岩电气有限公司 SHAN DONG BOAM CO.,LTD	
供应商料号: Supplier P/N	320-02889002	
名称: Part Name	BY-EE2230W01-0F4	
品名/规格: SPEC		
GlobTek料号: GlobTek P/N		
Edition No: 版本	2-0	
作成: Made by	确认: Check	承认: Approval
PS承认章: Approval Stamp	RD承认章: Approval Stamp <i>Talon.2011.1.13</i> 	QC承认章: Approval Stamp



SPECIFICATION

CUSTOMER	GLOBTEK(SUZHOU)	PART NAME	TRANSFORMER
MODEL NO.	EE2218W	PART NO.	320-02889002

1 DIMENSION(mm)



SPEC NO.	KF-11010101-A	DATE	2011.01.01	SHEET NO.	1	
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL
				孙小丽	潘秀丽	孙恩团

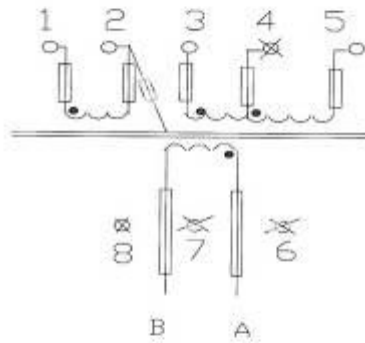
SHANDONG BOAM ELECTRIC CO.,LTD



SPECIFICATION

CUSTOMER	发行 GLOBTEK(SUZHOU)	PART NAME	TRANSFORMER
MODEL NO.	EE2218W	PART NO.	320-02889002

2 EQUIVALENT CIRCUIT (BOTTOM VIEW)



- * THE "λ" MARKS ARE START POINT
- * REMOVE PIN #6, 7, 8
- * CUTTING PIN #4
- * ALL TEFLON TUBE (A: BLACK; B: WHITE)

SPEC NO.	KF-11010101-A	DATE	2011.01.01	SHEET NO.	2	
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL
				孙小丽	潘秀丽	孙恩国

SHANDONG BOAM ELECTRIC CO



SPECIFICATION

CUSTOMER 发行章 GLOBTEK(SUZHOU)	PART NAME	TRANSFORMER
MODEL NO. EE2218W	PART NO.	320-02889002

3 ELECTRICAL CHARACTERISTICS

NO.	ITEM	TERMINAL	SPECIFICATION	REMARKS
1	INDUCTANCE	3—5	900 μ H \pm 10%	HIOKI 3531 Z HITESTER (1KHz,0.25V)
2	DIELECTRIC WITHSTAND VOLTAGE	PCOIL—SCOIL	AC 4.0KV 1MINUTE	HPT-50100Z PUNCTURE TESTER: 5mA
		COIL—CORE	AC1.5KV 1MINUTE	

SPEC NO.	KF-11010101-A	DATE	2011.01.01	SHEET NO.	3	
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL
				孙小丽	潘秀丽	孙恩国

SHANDONG BOAM ELECTRIC CO.,LTD



SPECIFICATION

CUSTOMER		GLOBTEK(SUZHOU)		PART NAME		TRANSFORMER	
MODEL NO.		EF2218W		PART NO.		320-02889002	
4. WINDING SPECIFICATION							
NO	PIN NO. (S-F) S:START, F:FINISH	WIRE	TURNS	WINDING METHOD			
W1	(3)-(4)	2UEW Φ 0.35	40	SOLENOID WINDING			
INSULATION: POLYESTER TAPE t= 0.025mm, w=9.0mm, 1Ts							
W2	(1)-(2)	2UEW Φ 0.19*3	13	SOLENOID WINDING			
INSULATION: BROWN TAPE t= 0.025mm, w=9.0mm, 2Ts							
W3	(A)-(B)	TEX-E 0.60	17	SOLENOID WINDING			
INSULATION: POLYESTER TAPE t= 0.025mm, w=9.0mm, 2 Ts							
W4	-(2)	0.05/7.0 mm,COPER+TAPE	0.9	CENTER			
INSULATION: POLYESTER TAPE t= 0.025mm, w=9.0mm, 2Ts TAPE: 0.025×12.0							
W5	(4)-(5)	2UEW Φ 0.35	20	SOLENOID WINDING			
INSULATION: POLYESTER TAPE t= 0.025mm, w=9.0mm, 2Ts							
CORE FIXING :POLYESTER TAPE t= 0.025mm, w=8.5mm, 3Ts							
CORE TAPE:2LAYER POLYESTER TAPE t= 0.025mm, w=28.0mm,LENGTH:45mm							
INSULATION: BROWN TAPE t= 0.05mm, w=17.0mm,2LAYER							
SPEC NO.		KF-11010101-A		DATE		2011.01.01	
SHEET NO.		4					
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL	
				孙小丽	潘秀丽	孙恩国	

SHANDONG BOAM ELECTRIC CO.,LTD



SPECIFICATION

CUSTOMER	GLOBTEK(SUZHOU)	PART NAME	TRANSFORMER			
MODEL NO.2011.1.14	EE2218W	PART NO.	320-02889002			
受控文件 版本号						
6. LIST OF MATERIALS						
NO.	COMPONENT	MATERIALS	MANUFACTURES	REMARKS		
1	CORE	EE2218W PC40	NAN JING JINNING CO.,LTD OR EQUIR			
2	BOBBIN	PHENOLIC EE2218W,8PIN	CHANGCHUN PLASTICS CO.,LTD	E59481		
3	WIRE	2UEW Φ 0.35	DONG YANG ELECTRONICS CO.,LTD OR EQUIR	E102761(S)		
		2UEW Φ 0.19	SUZHOU ASIA PACIFIC ELECTRONICS	E214423		
		TEX-E Φ 0.60	WUXI JINGYU ELECTRONIC APPLIANCE	E315032		
4	INSULATION TAPE	POLYESTER TAPE 0.025×9.0mm 0.025×12.0mm 2LAYER0.025×28.0mm 0.05×17mm	JINGJIANG PRESSURESENSITIVE GLUE FTY OR EQUIR	E165111 (N)		
5	CORE FIXING TAPE	POLYESTER TAPE 0.025×8.5mm				
6	COPPER TAPE	0.05×7.0mm	WUXI JINGYU ELECTRONIC APPLIANCE CO., LTD	E315032		
7	VARNISH	319-5F	JIANG YIN DENG FENG OR EQUIR			
8	TUBE	TEFLON	SHENZHEN CHANGBAO SPECIAL PLASTIC CO.,LTD OR EQUIR	E180908		
SPEC NO.	KF-11010101-A	DATE	2011.01.01	SHEET NO.	5	
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL
				孙小丽	潘秀丽	孙恩国

SHANDONG BOAM ELECTRIC CO.,LTD



SPECIFICATION

CUSTOMER	GLOBTEK(SUZHOU)	PART NAME	TRANSFORMER
MODEL NO.	EE2218W	PART NO.	320-02889002

* UL YELLOW CARD

1) BOBBIN

Component-Plastics

CHANG CHUN PLASTICS CO LTD

Y-388J	BK	0.62	94V-0	150	150	150	1	E59481 (S)			
		0.80	94V-0	150	150	150	1	(C-cont. from B card)			
T388J	BK, DN	1.00	94V-0	150	150	150	1	0	2	5	3
		0.79	94HB	150	150	150	1	0	2	5	3
		1.87	94HB	150	150	150	1	0	4	7	4
T373J	BK, DN	3.17	94HB	150	150	150	0	0	4	7	4
	NC	1.00	94V-1	150	150	150	2	0	3	6	4
		1.00	94V-0	150	150	150	2	0	3	6	4
T376J	BK, DN	2.00	94V-0	150	150	150	1	0	2	5	4
		0.79	94V-0	150	150	150	1	0	2	5	4
		1.88	94V-0	150	150	150	0	0	4	5	4
T377J	BK	3.17	94V-0	150	150	150	0	0	4	5	4
		0.78	94HB	150	150	150	0	0	4	7	4
		1.50	94HB	150	150	150	1	0	4	7	4
		3.17	94HB	150	150	150	0	0	4	7	4

Report: January 8, 1976.

Replaces E59481C dated February 7, 1989.
Underwriters Laboratories Inc.®

(Cont. on C1 card)
D11/0018986

2) WIRE

DONG YANG ELECTRONICS IND. CO., LTD.
600-1 HANWOL-RU TALAN-EUB HWASUNG-GUN
KYUNGGI-DO KOREA

E102761 (S)

Mil Dsg	IC	Coat Typ	OC	ANSI Type	TI
ALRW	Polyester-imide			MW35	200
IW	Polyester-imide			MW30	180
NY-IRW	Polyester-imide			MW70	180
NY-PEW	Polyester			MW24	155
NY-PEW(P)	Polyester			MW24	155
NY-UEW	Polyurethane			MW28	130
UEW	Polyurethane			MW15	130

Marking: Company name or "E102761" and material designation of marked designation on package of reel and Recognized Component Mark.

SHANGHAI ASIA PACIFIC ELECTRIC CO LTD E214423
2525 DAYIE RD WUCIAO FENGXIAN 201402 SHANGHAI, CHINA

Mil Dsg	Coat Type	OC	ANSI Type	Temp Class
EIW	Polyester-imide		MW30	180
			(@)	200
UEW	Polyurethane		MW82	180
			MW79	155#
			MW75	130#
PEW	Polyester		MW5	155
PEW/N	Polyester	Nylon	(@)	200
			MW76#	180
			MW24#	155

Non ANSI type.

#-Additional consideration is needed before used in system thermal aging.
Marking: Company name and material designation on package or reel, and Recognized Component Mark.

SPEC NO.	KF-11010101-A	DATE	2011.01.01	SHEET NO.	6	
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL
				孙小丽	潘秀丽	孙恩国

SHANDONG BOAM ELECTRIC CO.,LTD



SPECIFICATION

CUSTOMER 受控文件 及印章	GLOBTEK(SUZHOU)	PART NAME	TRANSFORMER
MODEL NO.	EE2218W	PART NO.	320-02889002

3) INSULATION TAPE

OANZ2 January 31, 2000
 Insulating Tape - Component
JINGJIANG PRESSURE SENSITIVE GLUE FTY E165111
 86 HENG GANG NORTH RD JINGJIANG, JIANGSU
 214500 CHINA

Nonwoven cloth/polyethylene terephthalate film tape, Cat. No. WF with suffixes, rated 130 C*(a).
 Polyethylene terephthalate film tape, Cat. No. CT with suffixes, rated 130 C*(c).
 Polyethylene terephthalate film tape, Cat. No. PZ with additional suffixes, rated 130 C*(b).
 *Complies with flame retardant requirements when so marked.
 (a) Comparative Tracking Index (CTI)% performance indicates material Group II, PLC=1, CTI equal to or greater than 400 but less than 600 v.
 (b) Comparative Tracking Index (CTI)% performance indicates material Group IIIa, PLC=2, CTI equal to or greater than 250 but less than 400 v.
 (c) Comparative Tracking Index (CTI)% performance indicates material Group I, PLC=0, CTI equal to or greater than 600 v.
 %The CTI test was conducted per IEC 112 and the assigned level is based on the testing of both film and adhesive sides.
 Marking: Company name or E165111 and catalog designation printed on the carton, wrapper or core.
 4/12/2000 Underwriters Laboratories Inc. Card 1 of 2

4) BARRIER TAPE

OANZ2 JULY 19, 1990
 Component - Insulating Tape E92677 (S)
TAE HWA INDUSTRIAL CO
 634 DEUNGCHON-DONG KANGSEO-KU, SEOUL
 157-030 KOREA

Flame retardant fiberglass cloth tape, Cat No. TH-80012
 Flame retardant acetate cloth tape, Cat No. 5701
 Flame retardant polyester film tape, Cat No. H-5673
 Marking: Company name or E92677 and Flame Retardant printed on carton wrapper and/or core.

See General Information Preceding These Recognitions.
 For use only in equipment where the acceptability of the combination is determined by Underwriters Laboratories Inc.

Reports: November 1, 1984; November 1, 1984; November 1, 1984.

Replaces E92677 dated February 2, 1989.
 358096005 Underwriters Laboratories Inc. 011/0111671 43

SPEC NO.	KF-11010101-A	DATE	2011.01.01	SHEET NO.	7		
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL	
				孙小丽	潘秀丽	孙恩国	

SHANDONG BOAM ELECTRIC CO.,LTD



医疗、资讯、车载、特种电源

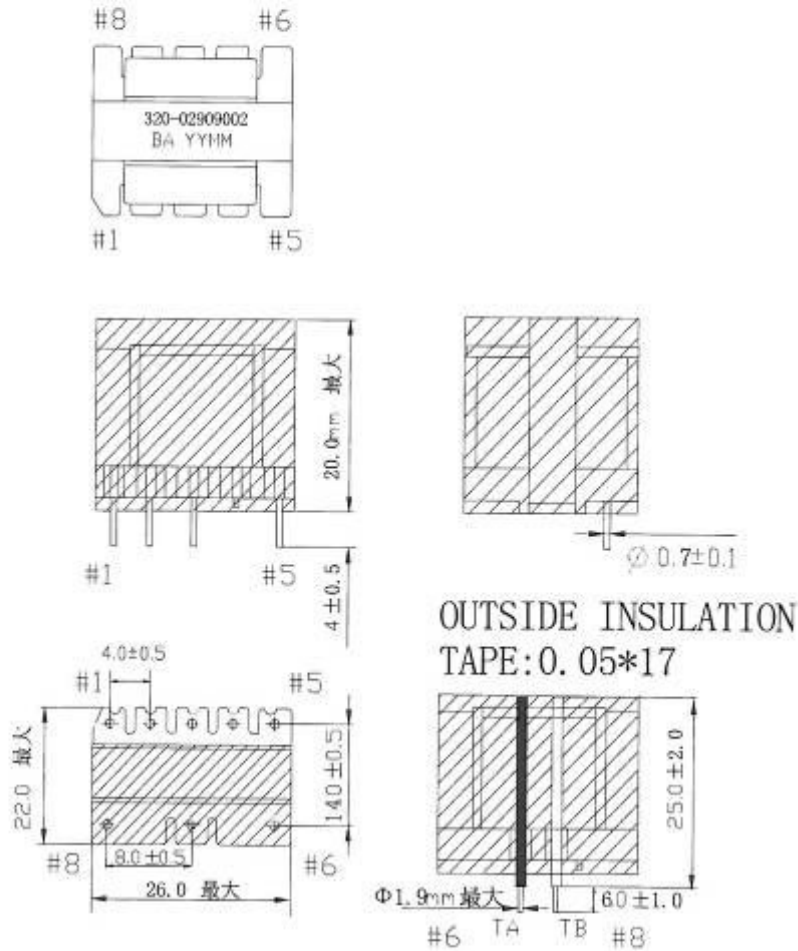
零件承认书 Material Approval		
制造商: Manufacturer		
供应商: Supplier	山东宝岩电气有限公司 SHAN DONG BOAM CO.,LTD	
供应商料号: Supplier P/N	320-02909002	
名称: Part Name	BY-EE2230W01-0F6	
品名/规格: SPEC		
GlobTek料号: GlobTek P/N	320-02909002	
Edition No: 版本	B0	
作成: Made by	确认: Check	承认: Approval
PS承认章: Approval Stamp	RD承认章: Approval Stamp <i>Talon. 2011. 2. 16</i>  2/16 11	QC承认章: Approval Stamp 



SPECIFICATION

CUSTOMER	GLOBTEK(SUZHOU)	PART NAME	TRANSFORMER
MODEL NO.	EE2218W	PART NO.	320-02909002

1 DIMENSION(mm)



SPEC NO.	KF-11012101-A	DATE	2011.01.21	SHEET NO.	1		
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL	
				孙小丽	潘秀丽	孙恩国	

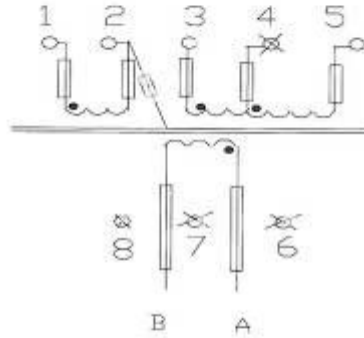
SHANDONG BOAM ELECTRIC CO.,LTD



SPECIFICATION

CUSTOMER	GLOBTEK(SUZHOU)	PART NAME	TRANSFORMER
MODEL NO.	EE218W	PART NO.	320-02909002

2 EQUIVALENT CIRCUIT (BOTTOM VIEW)



- * THE "λ" MARKS ARE START POINT
- *REMOVE PIN #6, 7, 8
- *CUTTING PIN #4
- * ALL TEFLON TUBE (A: BLACK; B:WHITE)

SPEC NO.	KF-11012101-A	DATE	2011.01.21	SHEET NO.	2	
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL
				孙小丽	潘秀丽	孙恩国

SHANDONG BOAM ELECTRIC CO



SPECIFICATION

CUSTOMER 受控文 GLOBTEK(SUZHOU)	PART NAME	TRANSFORMER
MODEL NO. 发行章 E2218W	PART NO.	320-02909002

3 ELECTRICAL CHARACTERISTICS

NO.	ITEM	TERMINAL	SPECIFICATION	REMARKS
1	INDUCTANCE	3—5	900 μ H \pm 10%	HIOKI 3531 Z HITESTER (1KHz,0.25V)
2	DIELECTRIC WITHSTAND VOLTAGE	PCOIL—SCOIL	AC 4.0KV 1MINUTE	HPT-50100Z PUNCTURE TESTER: 5mA
		COIL—CORE	AC1.5KV 1MINUTE	

SPEC NO.	KF-11012101-A	DATE	2011.01.21	SHEET NO.	3	
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL
				孙小丽	潘秀丽	孙恩国

SHANDONG BOAM ELECTRIC CO.,LTD

SPECIFICATION

CUSTOMER	GIGABYTE(SUZHOU)	PART NAME	TRANSFORMER			
MODEL NO. 2011.2.16	EE2218W	PART NO.	320-02909002			
受控文件 6. LIST OF MATERIALS						
NO.	COMPONENT	MATERIALS	MANUFACTURES	REMARKS		
1	CORE	EE2218W PC40	NAN JING JINNING CO.,LTD OR EQUIR			
2	BOBBIN	PHENOLIC EE2218W,8PIN	BAKELITE GESELLDCHAFT MBH OR EQUIR	E61040 (M)		
3	WIRE	2UEW Φ 0.35	DONG YANG ELECTRONICS CO.,LTD OR EQUIR	E102761(S)		
		2UEW Φ 0.19	SUZHOU ASIA PACIFIC ELECTRONICS	E214423		
		TEX-E Φ 0.60	FURUKAWA ELECTRIC CO.,LTD	E157568(S)		
4	INSULATION TAPE	POLYESTER TAPE 0.025×9.0mm 0.025×12.0mm 2LAYER0.025×28.0mm 0.05×17mm	JINGJIANG PRESSURESENSITIVE GLUE FTY OR EQUIR	E165111 (N)		
5	CORE FIXING TAPE	POLYESTER TAPE 0.025×8.5mm				
6	COPPER TAPE	0.05×7.0mm	POONGSAN METAL CO.,LTD or equiv			
7	VARNISH	319-5F	JIANG YIN DENG FENG OR EQUIR			
8	TUBE	TEFLON	SHENZHEN CHANGBAO SPECIAL PLASTIC CO.,LTD OR EQUIR	E180908		
SPEC NO.	KF-11012101-A	DATE	2011.01.21	SHEET NO.	5	
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL
				孙小雨	潘秀丽	孙恩国

SHANDONG BOAM ELECTRIC CO.,LTD



SPECIFICATION

CUSTOMER	GLOBTEK(SUZHOU)	PART NAME	TRANSFORMER
MODEL NO.	EE2218W	PART NO.	320-02909002

*** UL YELLOW CARD**

1) . BOBBIN

BAKELITE GESELLSCHAFT MBH
GENNAER STRASSE 2-4 D-5860. ISEKLOHN-LETMATHE E61040 (M)
FED REP GERMANY

Mil Dsg	Col	mm	Class	Imp	Imp	RTI	H	H	V	4	C
Phenolic molding compound(PF), designated 'Rutaform' or Bakelite.						w/o	W	A	T	9	T
PF2736	BK	0.81	94V-0	150	150	150	-				
		1.57	94V-0	150	150	150	0	2	0	-	-
		3.07	94V-0	150	150	150	0	2	0	5	3
		3.07	94V-0	150	150	150	0	2	0	5	3

2) WIRE

DONG YANG ELECTRONICS IND. CO., LTD.
60-1 BANWOL-RI TAIAN-EUB HWASUNG-GUN E102761 (S)
KYUNGGI-DO KOREA

Mil Dsg	HC	Coat Typ	OC	ANSI	TI
ALBW	Polyester-imide	Polyamide-imide		MW35	200
EW	Polyester-imide	Polyamide		MW30	180
NY-EW	Polyester-imide			MW70	180
NY-PEW	Polyester	Polyamide		MW24	155
NY-PEW(P)	Polyester	Polyamide		MW24	155
NY-LBW	Polyurethane	Polyamide		MW28	130
UEW	Polyurethane			MW15	130

Marking: Company name or "E102761" and material designation of marked designation on package of reel and Recognized Component Mark.

SHANGHAI ASIA PACIFIC ELECTRIC CO LTD E214423
2525 DAVIE RD WUCIAO FENGXIAN 201402 SHANGHAI, CHINA

Mil Dsg	Coat Type	OC	ANSI Type	Temp Class
EW	Polyester-imide		MW30	180
UEW	Polyurethane		MW82	180
			MW79	155#
			MW75	130#
PEW	Polyester		MW5	155
PEW/N	Polyester	Nylon		200
			MW76#	180
			MW24#	155

Non-ANSI type.
Additional consideration is needed before used in system thermal aging.
Marking: Company name and material designation on package of reel, and Recognized Component Mark.

SPEC NO.	KF-11012101-A	DATE	2011.01.21	SHEET NO.	6	
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL
				孙小丽	潘秀丽	孙恩国

SHANDONG BOAM ELECTRIC CO.,LTD



SPECIFICATION

CUSTOMER	GLOBTEK(SUZHOU)	PART NAME	TRANSFORMER
MODEL NO.	EE2218W	PART NO.	320-02909002

3) INSULATION TAPE

OANZZ January 31, 2000
 Insulating Tape - Component
 JINGJIANG PRESSURE SENSITIVE GLUE FTY
 88 HENG GANG NORTH RD JINGJIANG, JIANGSU
 214500 CHINA E165111

Nonwoven cloth/polyethylene terephthalate film tape, Cat. No. WF with suffixes, rated 130 C*(a).
 Polyethylene terephthalate film tape, Cat. No. CT with suffixes, rated 130 C*(c).
 Polyethylene terephthalate film tape, Cat. No. PZ with additional suffixes, rated 130 C*(b).
 *Complies with flame retardant requirements when so marked.
 (a)Comparative Tracking Index (CTI)% performance indicates material Group II, PLC=1, CTI equal to or greater than 400 but less than 600 v.
 (b)Comparative Tracking Index (CTI)% performance indicates material Group IIIa, PLC=2, CTI equal to or greater than 250 but less than 400 v.
 (c)Comparative Tracking Index (CTI)% performance indicates material Group I, PLC=0, CTI equal to or greater than 600 v.
 *The CTI test was conducted per IEC 112 and the assigned level is based on the testing of both film and adhesive sides.
 Marking: Company name or E165111 and catalog designation printed on the carton, wrapper or core.
 4/12/2000 Underwriters Laboratories Inc. Card 1 of 2

4) BARRIER TAPE

OANZZ JULY 19, 1990
 Component - Insulating Tape E92677 (S)

TAE HWA INDUSTRIAL CO
 634 DEUNGCHON-DONG KANGSEO-KU, SEOUL
 157-030 KOREA

Flame retardant fiberglass cloth tape, Cat No. TH-GC012
 Flame retardant acetate cloth tape, Cat No. 6701
 Flame retardant polyester film tape, Cat No. H-5673
 Marking: Company name or E92677 and Flame Retardant printed on carton wrapper and/or core.

See General Information Preceding These Recognitions.
 For use only in equipment where the acceptability of the combination is determined by Underwriters Laboratories Inc.
 Reports: November 1, 1984; November 1, 1984; November 1, 1984.

Replaces E92677 dated February 2, 1989.
 25086005 Underwriters Laboratories Inc. 011/0111671 43

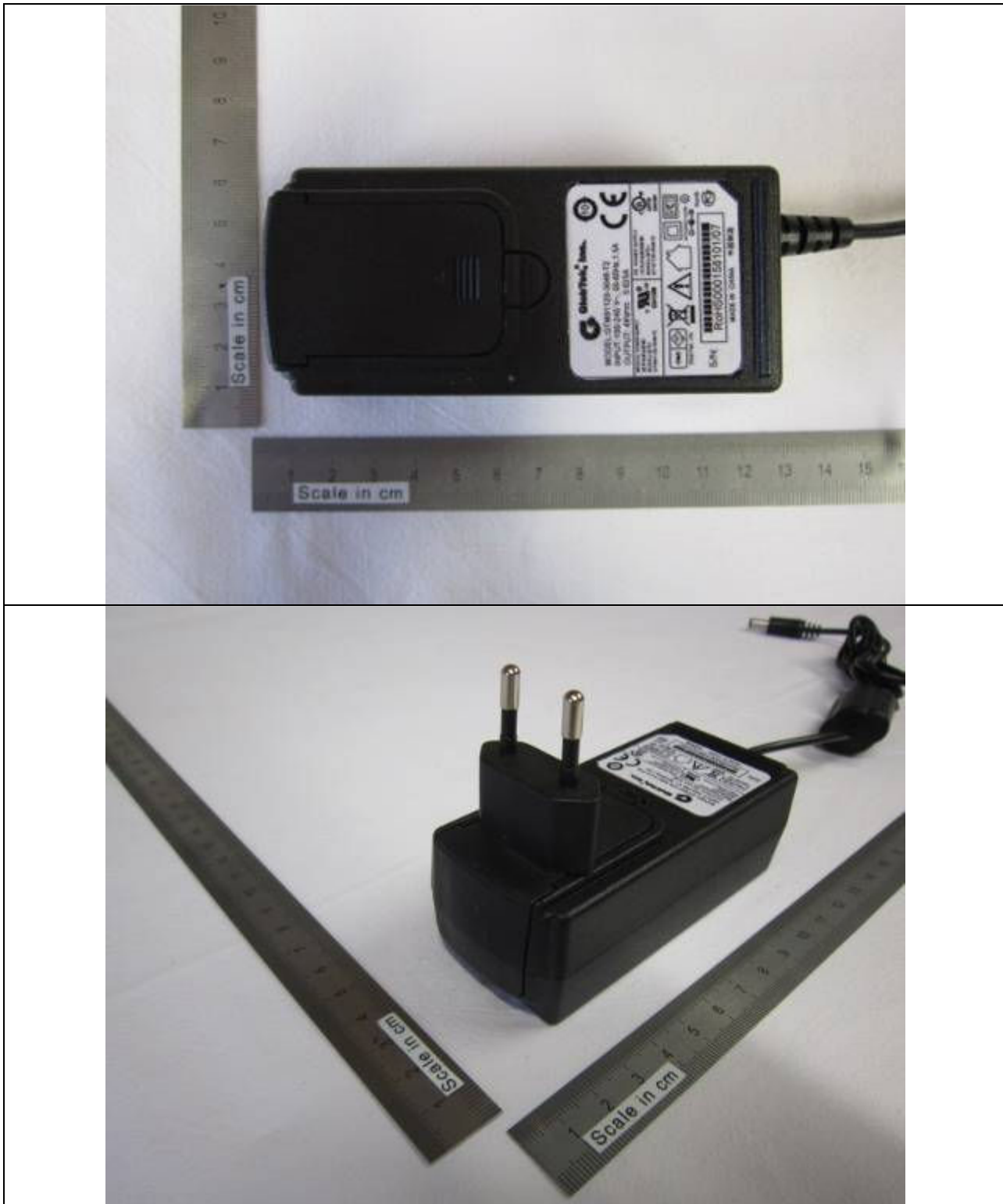
SPEC NO.	KF-11012101-A	DATE	2011.01.21	SHEET NO.	7	
NO.	DATE	REVISION	CHECKED	DESIGN	CHECK	APPROVAL
				孙小丽	潘秀丽	孙恩团

SHANDONG BOAM ELECTRIC CO.,LTD

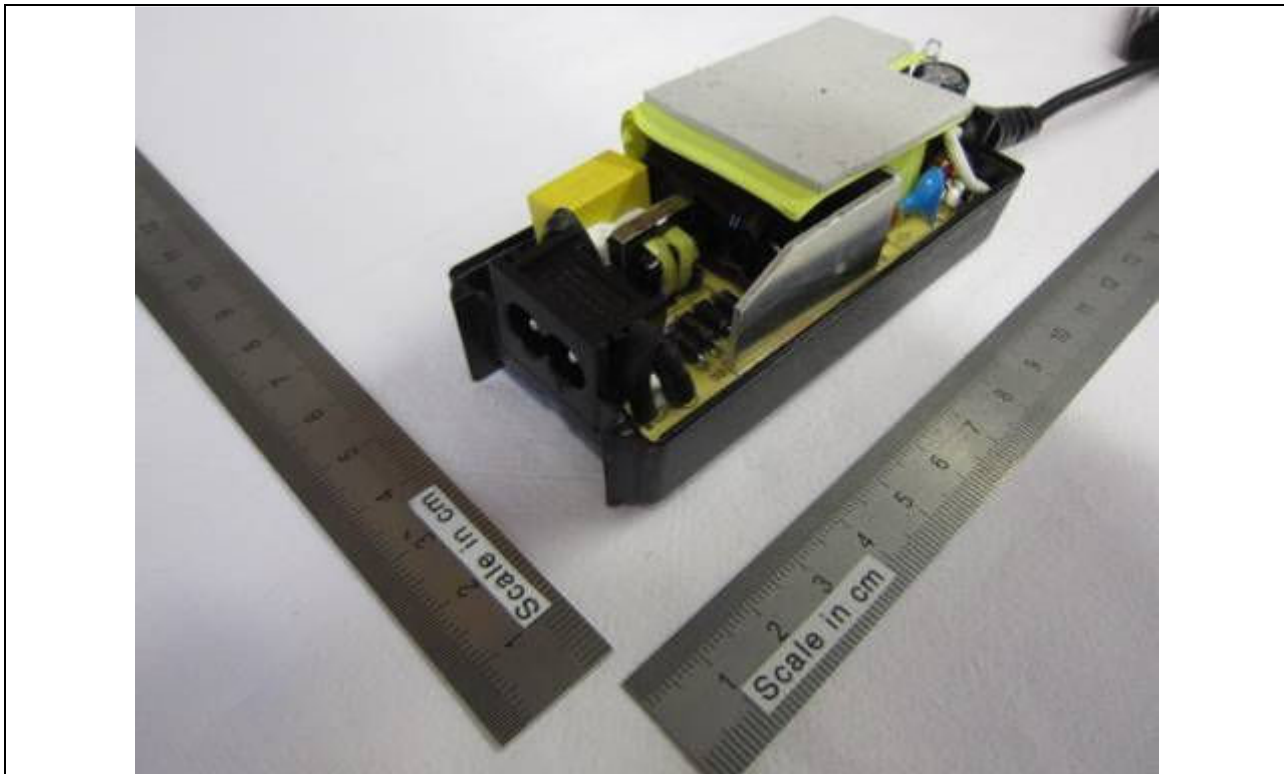
Enclosure No. 2 (Photos)

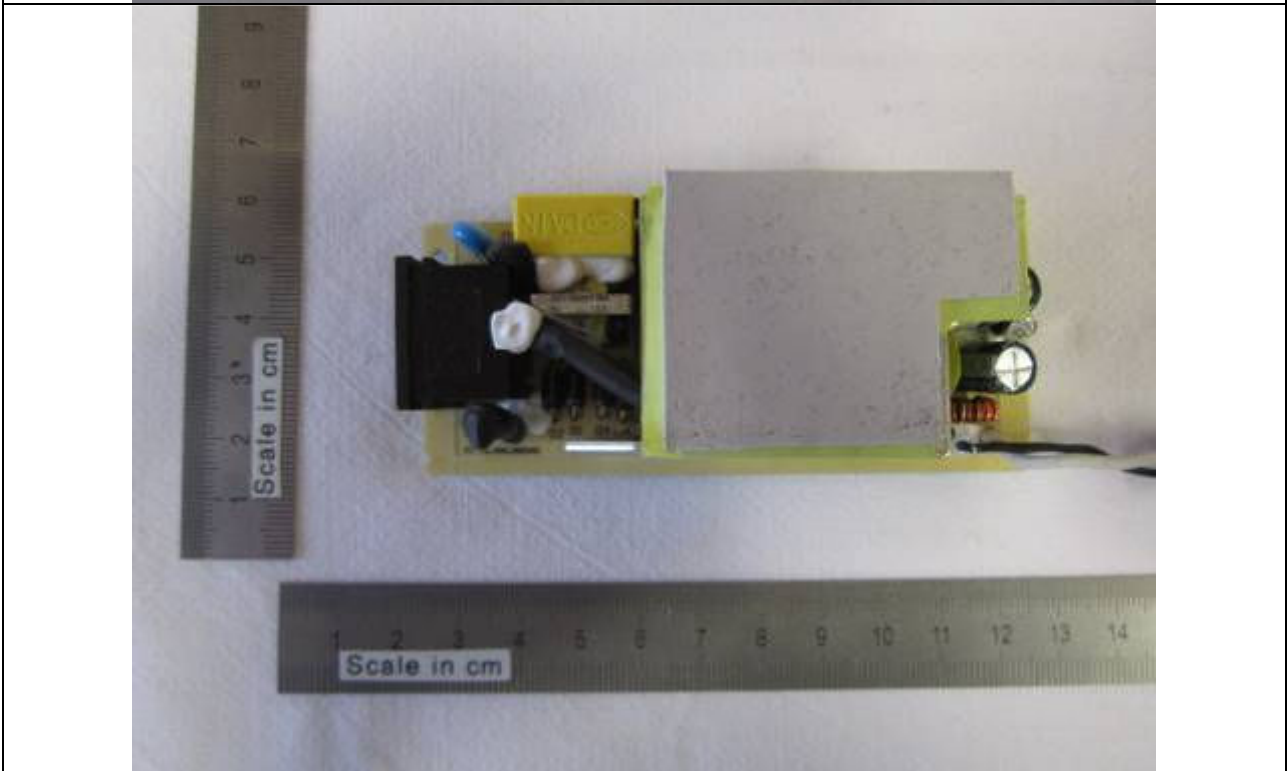
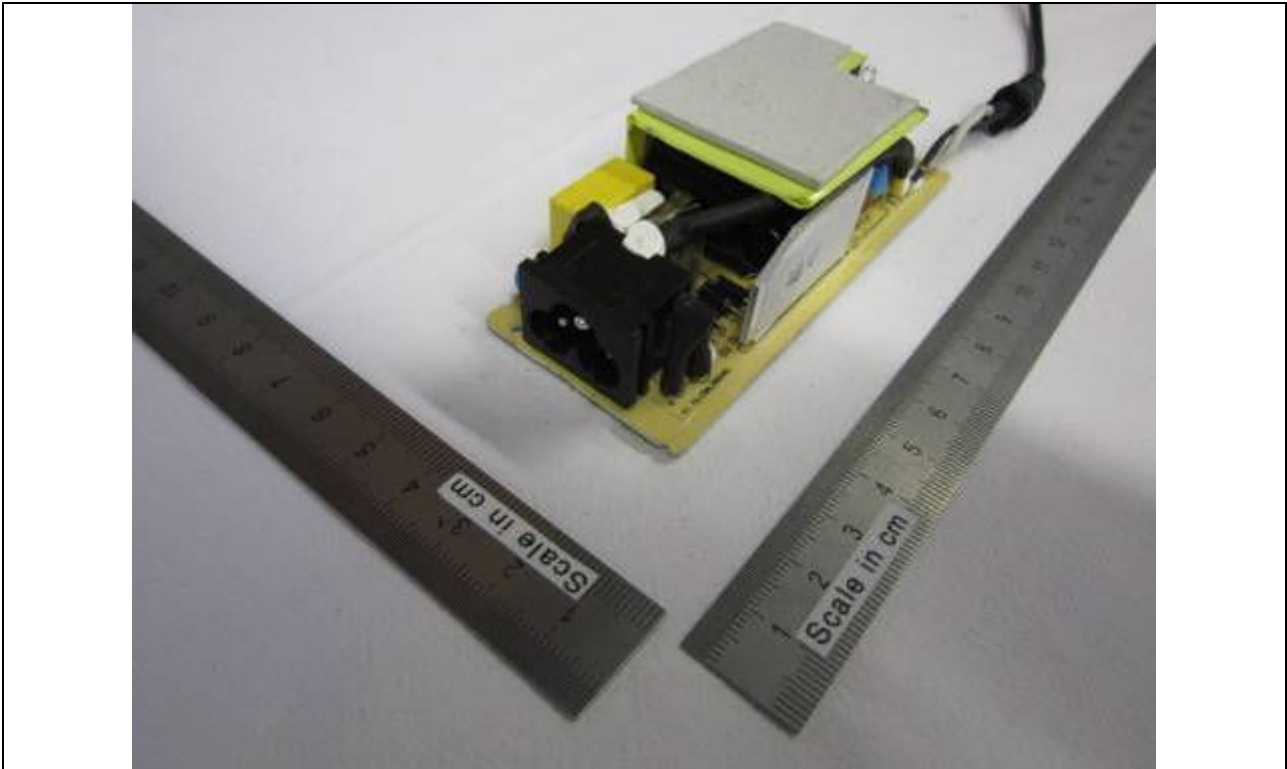
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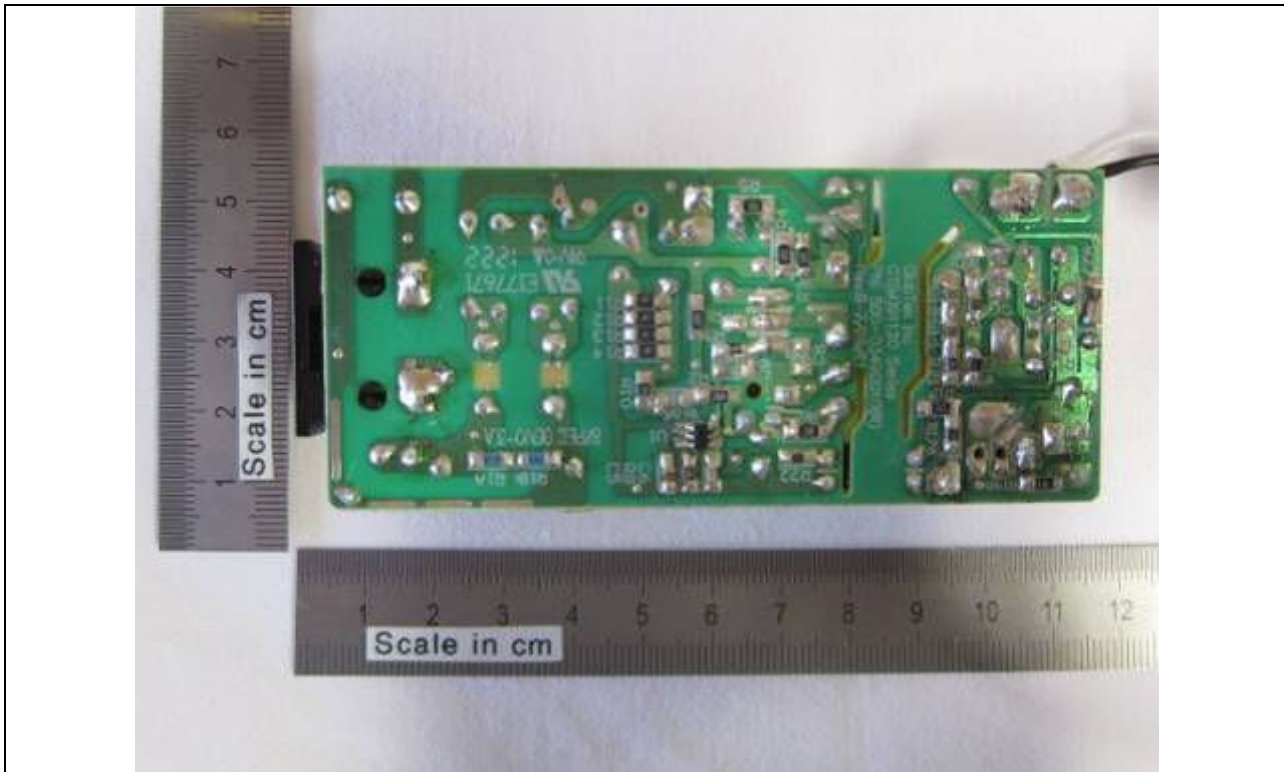






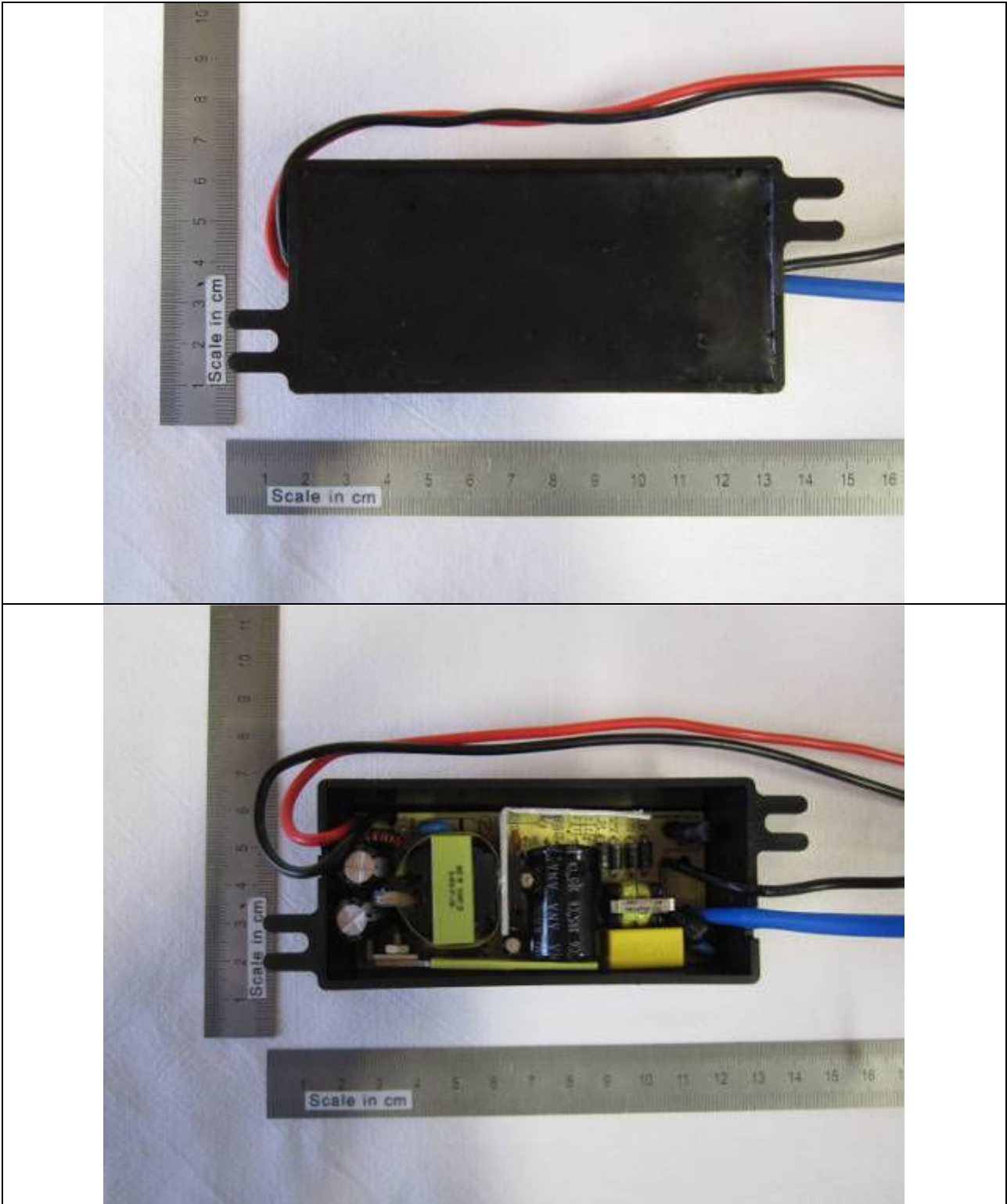


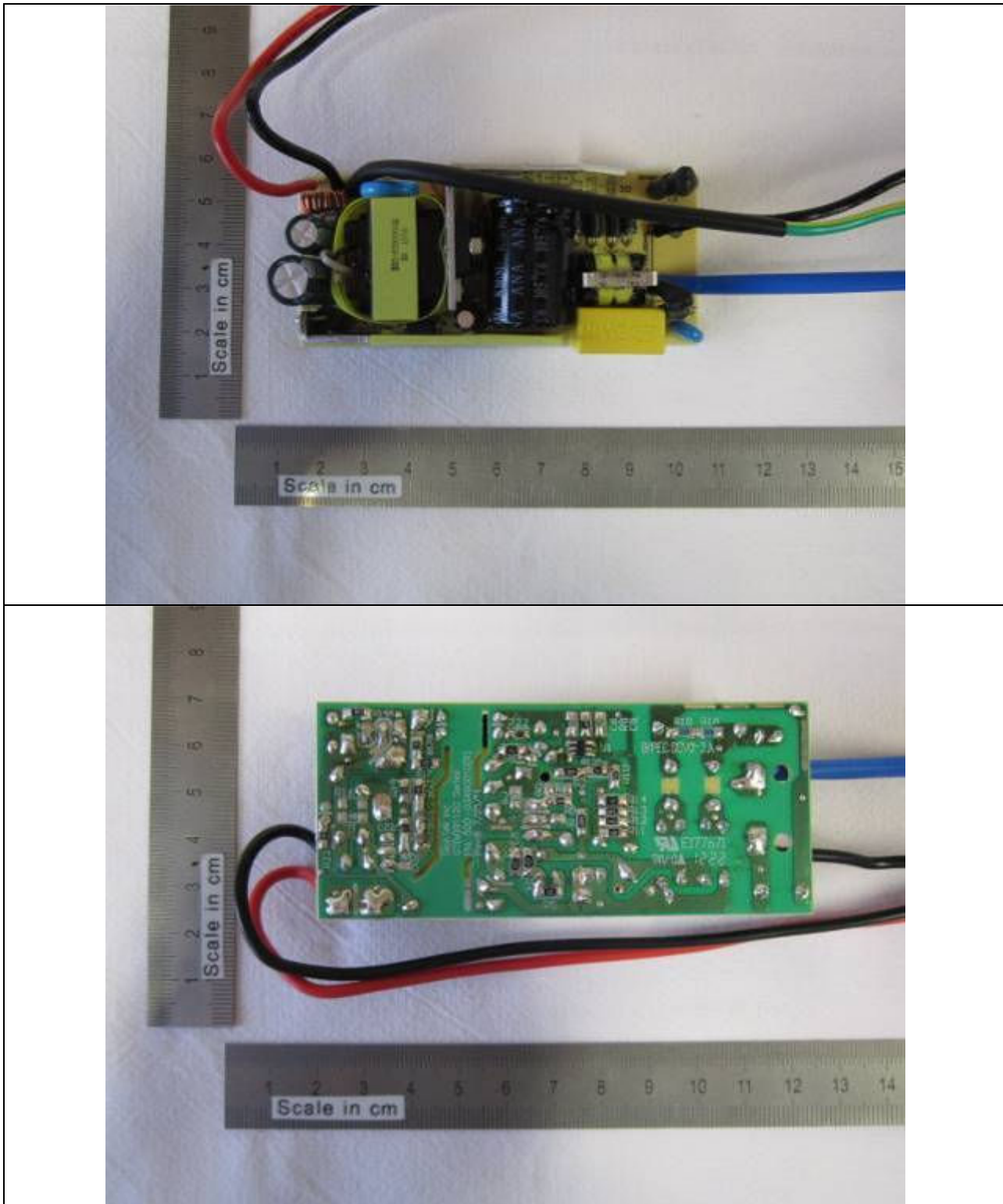




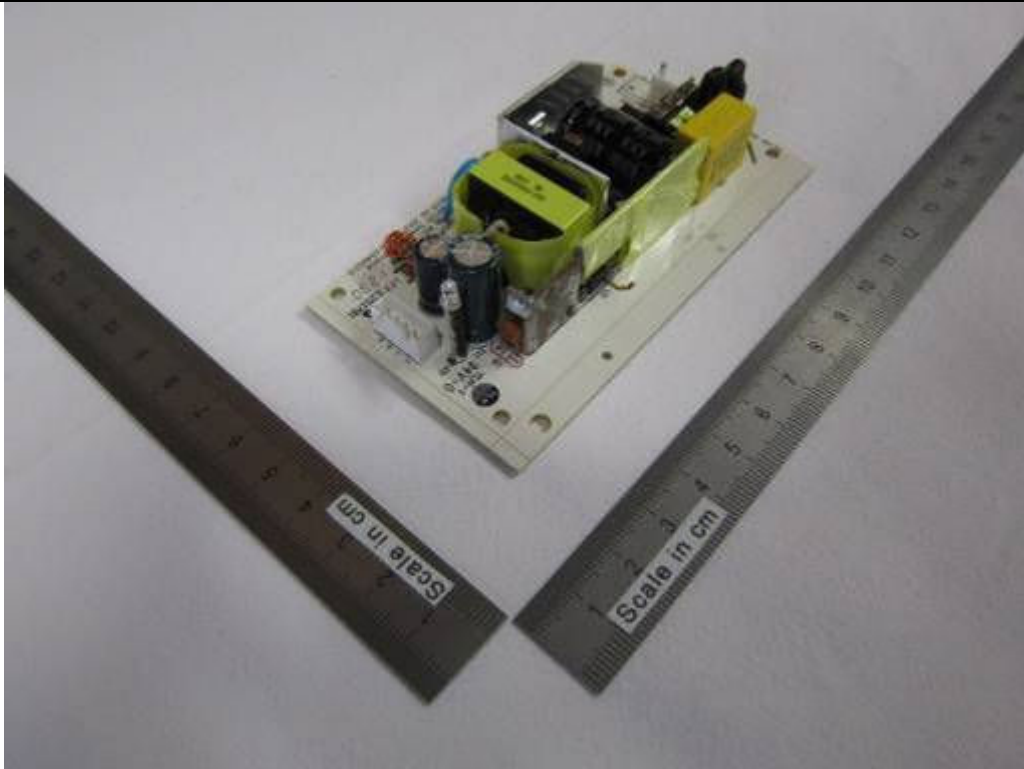
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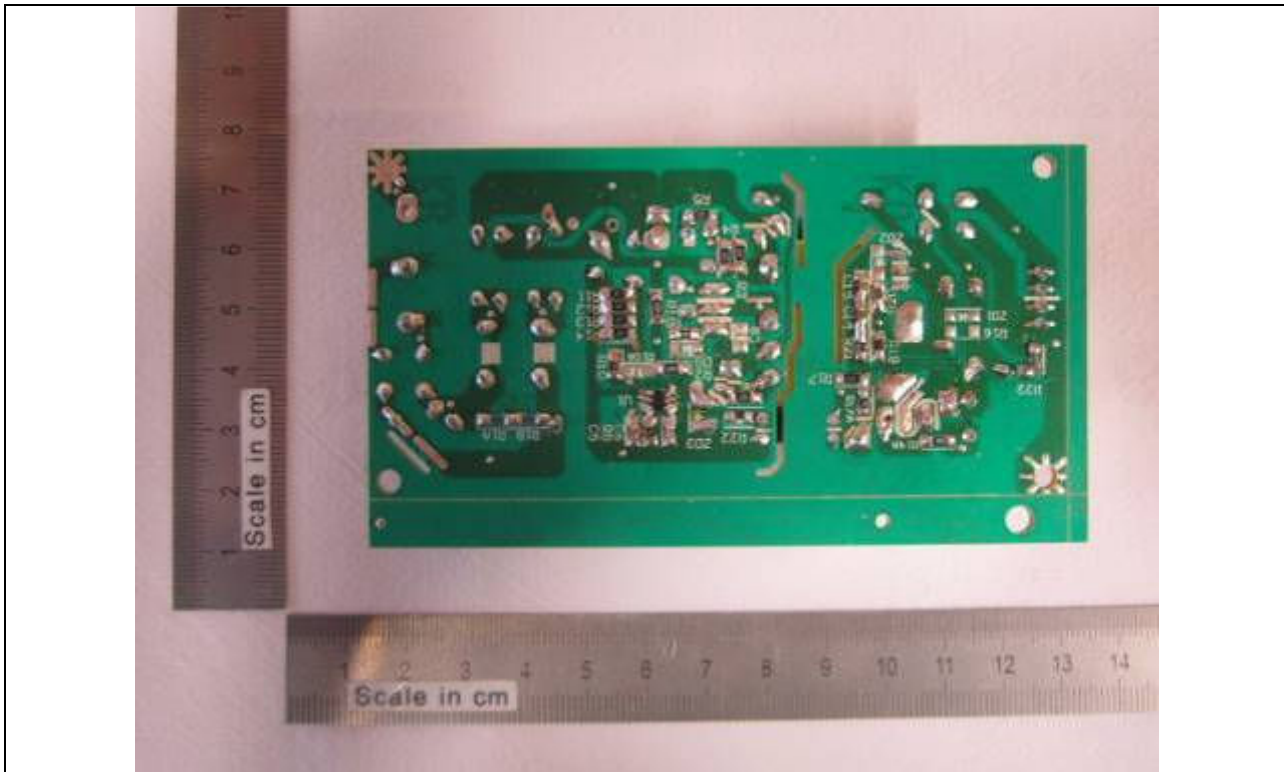






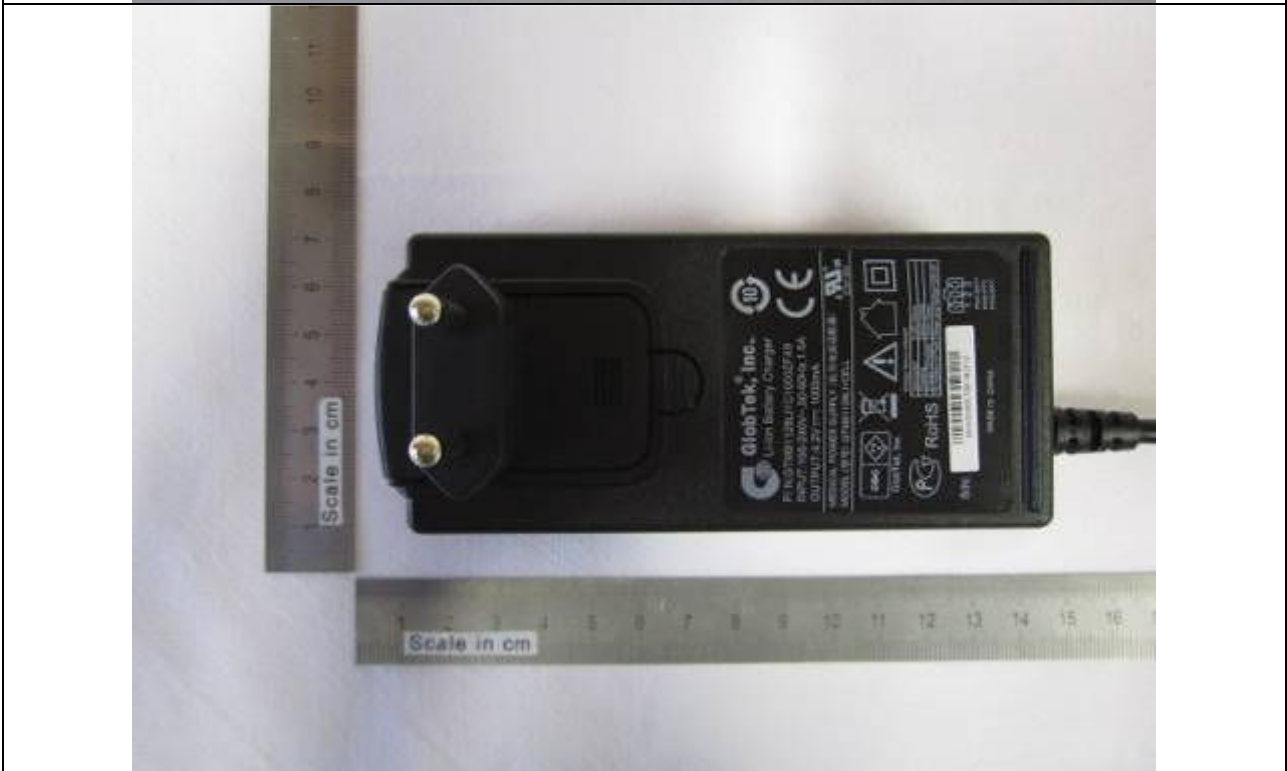
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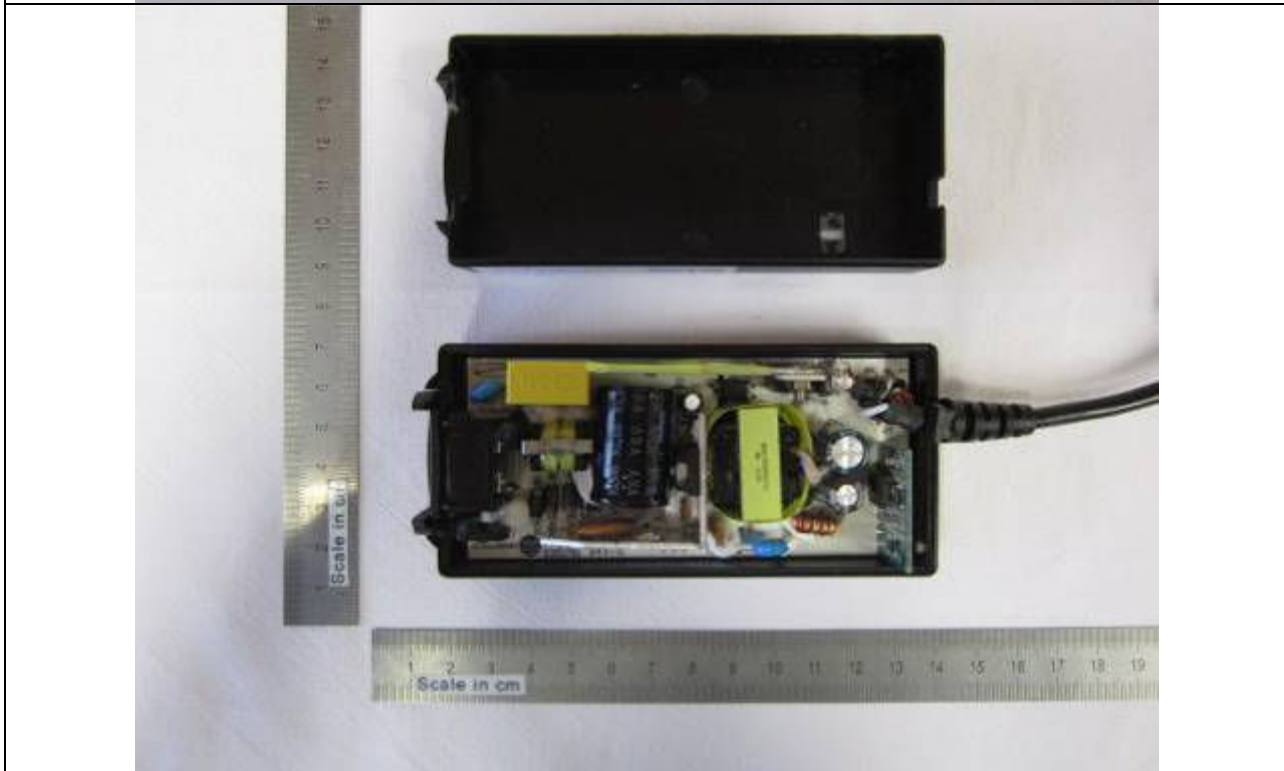
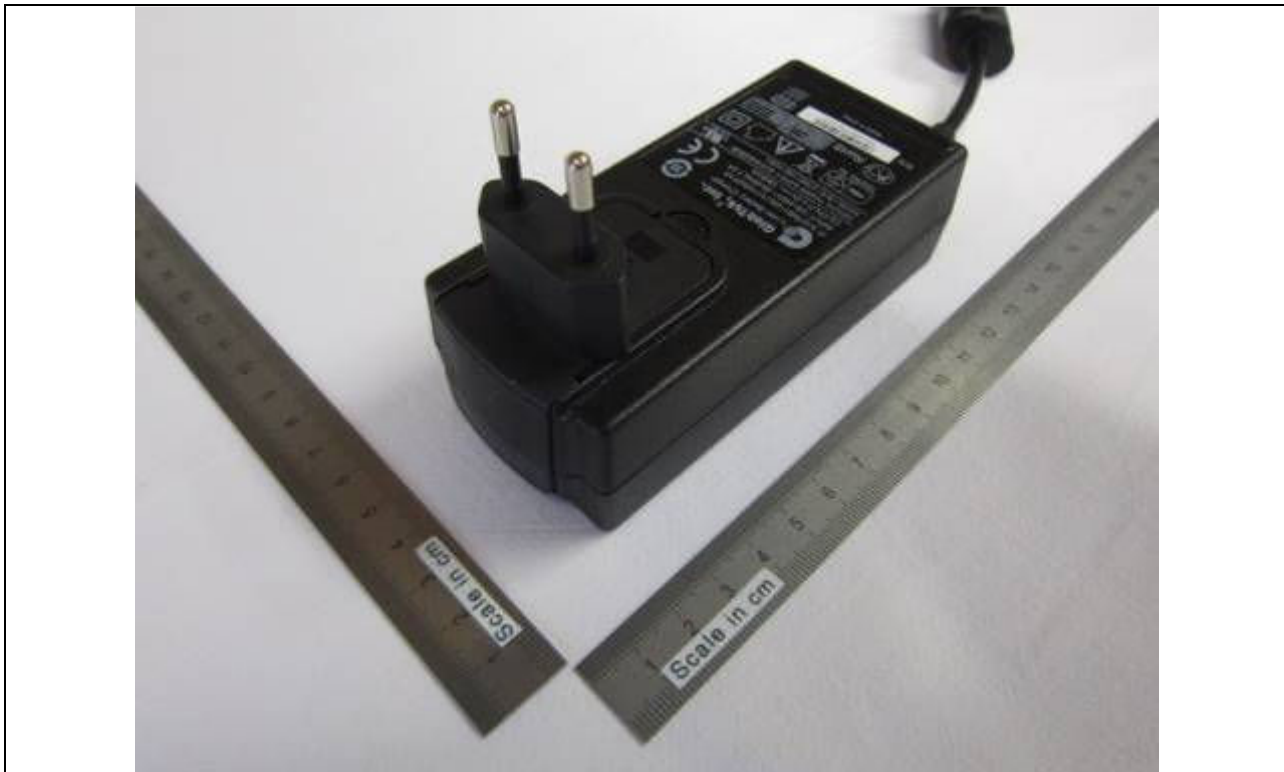


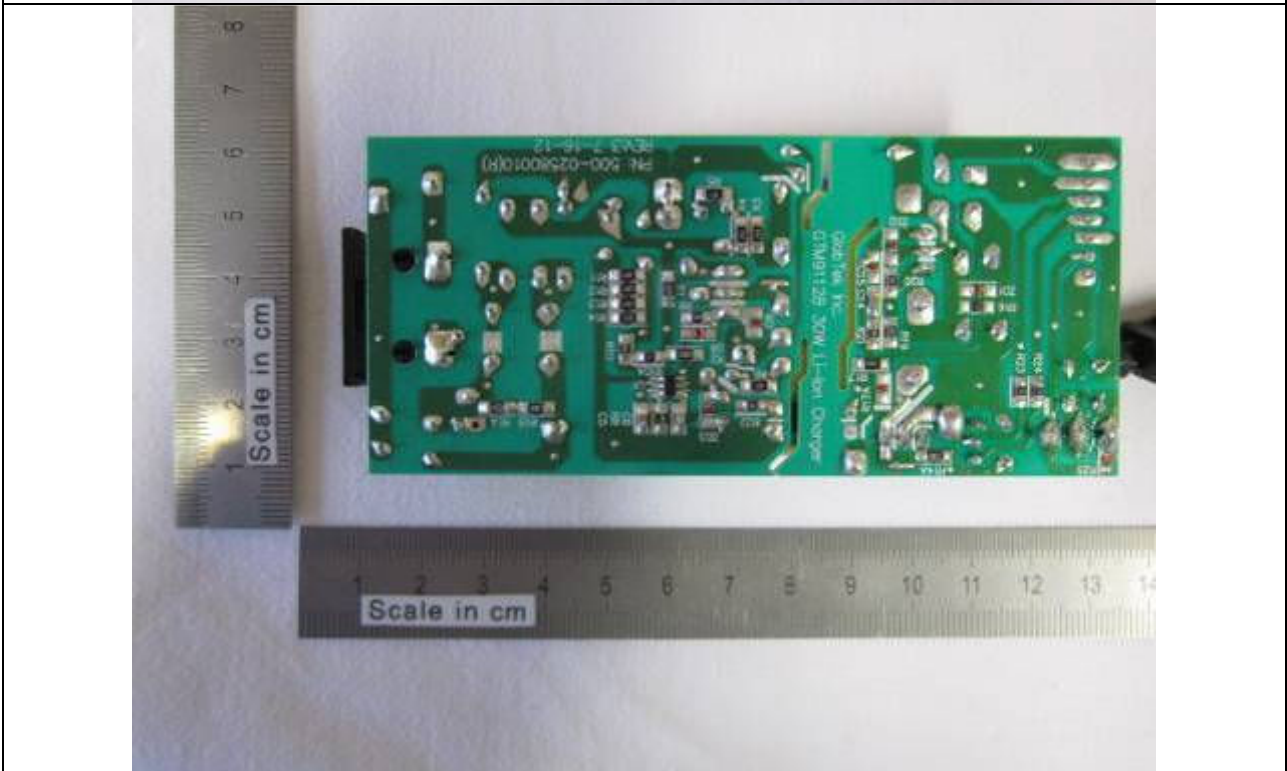
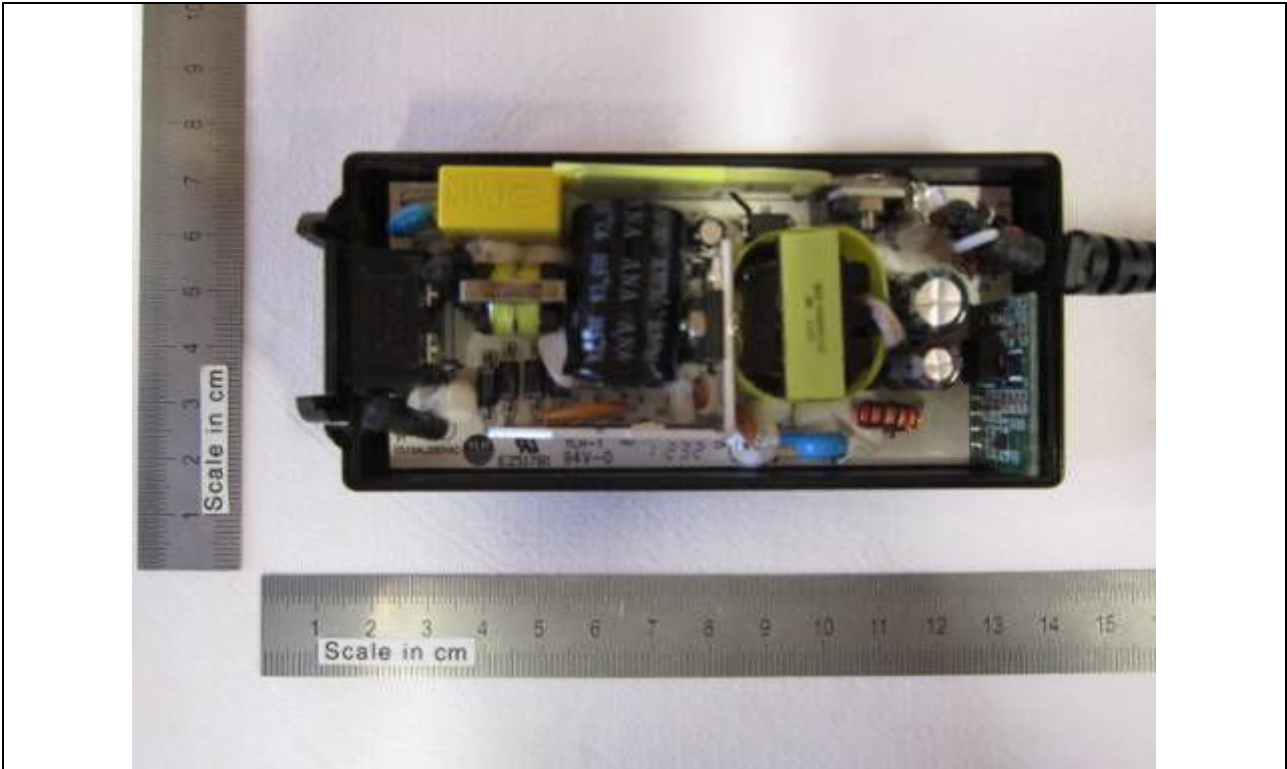


GTM91128LI1CELL, GTM91128LI2CELL, GTM91128LI3CELL









Enclosure No. 3

(National deviations)

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
Annex ZZ	Variations to IEC 61558-1 Ed 2.1 for application in Australia and New Zealand		
5.5	<i>Replace the text with the following variation: For a.c., test voltages are of substantially sinusoidal wave form, and, if not otherwise specified, have a frequency of 50 Hz.</i>		P
8.1	After Item a) <i>insert</i> the following variation: – The marking of rated voltage or rated voltage range of single-phase transformers shall cover 240V for Australia and 230 V for New Zealand and, for polyphase transformers, 415 V for Australia and 400 V for New Zealand	Input voltage range: 100-240 V	P
	Table 1 <i>Insert</i> the following entry: Insulated pins of transformers with pins for insertion into socket-outlets 70		P
16.4	After item a) <i>insert</i> the following variation: <i>Items b) and c), Table 5, and the last four paragraphs of the test specification are not applicable.</i>		P
19.15	<i>Replace the test specification with the following variation: Compliance is checked by inserting the transformer, as in normal use into a socket-outlet capable of accepting a 10 A plug complying with Figure 2.1(a) of AS/NZS 3112. The socket-outlet has a horizontal pivot at a distance of 8 mm behind the engagement face of the socket-outlet and in the plane of the lower intersection of the centre lines of the contact apertures.</i>		P
19.16	Void.		P
19.201	After 19.23 <i>insert</i> the following variation:		P
	Transformers having integral pins for insertion into socket outlets shall comply with the appropriate requirements of AS/NZS 3112.		P
	<i>Compliance is checked as specified in Appendix J of AS/NZS 3112</i>		P
	NOTE 1 Clause J.2.2.3 (Internal connections for plug portions) of AS/NZS 3112 is covered by clause 19.6 and clause 21 of this standard NOTE 2 Clause J.2.2.6.2 (High voltage test) of AS/NZS 3112, except for the test of the insulation of the insulated pins, is covered by clause 18 of this standard. NOTE 3 Clause J.2.2.6.4 (Temperature rise test) of AS/NZS 3112 is covered by clause 14 of this standard NOTE 4 Clause J.2.2.6.7 (Equipment with integral pins intended to be supported by the contacts of a socket-outlet) of AS/NZS 3112 is covered by clause 19.15 of this standard		P
20	<i>Replace the first and third paragraphs with the following variations:</i>		P

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	Components shall comply with the safety requirements specified in the relevant IEC or Australian/New Zealand Standards as far as they reasonably apply.		P
	Compliance with the IEC or Australian/New Zealand Standards for the relevant component does not necessarily ensure compliance with the requirements of this Standard.		N/A
20.5	<i>Insert</i> in the second paragraph in the requirement, before IEC 60906-3 the following variation: Annex E in AS/NZS 3112 or		N/A
22.4	<i>Replace</i> the text with the following variation: Void.		N/A
22.6	<i>Replace</i> in the requirement, "16" with the following variation: "10".		P
22.8	<i>Replace</i> the second paragraph in the requirement, with the following variation: Power supply cords of portable transformers shall be fitted with an appropriately rated plug complying with AS/NZS 3112 or AS/NZS 3123 or IEC 60309		P