Test Report issued under the responsibility of:

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. .....:	141101780SHA-001
Date of issue .....:	2014-12-12
Total number of pages.....	149
Applicant's name.....:	GlobTek, Inc.
Address .....:	186 Veterans Dr. Northvale, NJ 07647 USA
Test specification:	
Standard .....:	IEC 61558-2-16:2009 (First Edition) + A1:2013 used in conjunction with IEC 61558-1: 2005 (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

If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.
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Test item description ..... :	Switching mode power supplies for general purpose
Trade Mark ..... :	GlobTek
Manufacturer ..... :	Same as applicant
Model/Type reference ..... :	GT-41134-0606-W2-TAB, GT*41134-***-*** (The 1st "*" part can be 'M' or '-' or 'H' for market identification and not related to safety. The 2nd "*" denotes the rated output wattage designation, which can be "01" to "06", with interval of 1. The 3rd "*" denotes the standard rated output voltage designation, which can be "06", "12", "15", "18", "24", "36" or "48". The 4th "*" is optional deviation, subtracted from standard output voltage, which can be "-0.1" to "-11.9" with interval of 0.1, or blank to indicate no voltage different. The 3rd "*" and 4th "*" together denote the output voltage, with a range of 5 - 48 volts. The 5th "*" can be "F" or "FW" to denote open frame model with connector which is fixing on the PCB. "F" represent models with Class I connector and "FW" represent models with Class II connector. The 6th "*" can be blank or "T". When the 6th "*" is "T" to denote open frame model with appliance inlet. When the 6th "*" is "T", the 7th "*" can be "2" representing models with Class II inlet or "3" and "3A" representing model with two types of Class I inlets C14 and C6 respectively. When the 6th "*" is blank, the 7th "*" is blank too. The last three asterisks with hyphen "-***" are blank to denote direct plug-in model series.)
Ratings ..... :	**GT-41134-0606-W2-TAB:** ta:50°C, Class II, IP20, Input: 120V~, 60 Hz, 0.3A; Output: 6VDC, 1A. with fixed integral plug. **GT*41134-***-***:** ta:40°C. Class II, IP20 for GT*41134-***; class II construction for GT*41134-***-FW and GT*41134-***-FWT2; class I construction for GT*41134-***-F, GT*41134-***-FT3 and GT*41134-***-FT3A, Input: 100-240V~, 50-60Hz, 0.6A; Output: 5-48VDC, 6W max. with detachable integral plug or open frame construction.

Detailed model list:

Model	voltage	Max. current	Max. power
GT*41134-*06*-***	5-6V	1.2A	6W
GT*41134-*12*-***	6.1-12V	0.98A	6W
GT*41134-*15*-***	12.1-15V	0.50A	6W
GT*41134-*18*-***	15.1-18V	0.40A	6W
GT*41134-*24*-***	18.1-24V	0.33A	6W
GT*41134-*36*-***	24.1-36V	0.25A	6W
GT*41134-*48*-***	36.1-48V	0.16A	6W

Testing procedure and testing location:			
☒	**CB Testing Laboratory:**	Intertek Testing Services Shanghai.	
Testing location/ address.....:		Building No. 86, 1198 Qinzhou Road (North) 200233 Shanghai CHINA	
☐	**Associated CB Testing Laboratory:**		
Testing location/ address.....:			
Tested by (name + signature).....:		Will Wang	Will Wang
Approved by (name + signature).....:		Robin Xu	Robin Xu
☐	**Testing procedure: TMP/CTF Stage 1:**		
Testing location/ address.....:			
Tested by (name + signature).....:			
Approved by (name + signature).....:			
☐	**Testing procedure: WMT/CTF Stage 2:**		
Testing location/ address.....:			
Tested by (name + signature).....:			
Witnessed by (name + signature).....:			
Approved by (name + signature).....:			
☐	**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).....:			

List of Attachments (including a total number of pages in each attachment):

Appendix No.1: Photos of product; (page 113-132,total 20 pages)
Appendix no.2: Equipment combined with two-pole plug (Class II EU plug); (page 133-134, total 2 pages)
Appendix no. 3: Dimension Checking for Two-pin plug according to EN50075 (EU plug); (page 135-136, total 2pages)
Appendix no. 4：Supplementary tests on plug portion according to BS1363: Part 3 + Amd 9543 + Amd 14225 + Amd 14540 and IEC 60884-1:2002 + A1:2006 (British plug); (page 137-139,total 3 pages)
Appendix no. 5：Dimension Checking for plug According to BS1363 (British plug); (page 140-142, total 3 pages)
Appendix 6: Dimension Checking for United States plug According to ANSI/NEMA WD6-2002 Figure 1 - 15P (USA plug); (page 143, total 1 page)
Appendix no. 7 and 8: The Australian plug was tested according to Annex J of AS/NZS 3112:2004+A1:2006 and IEC 60884-1:2002 + A1:2006 (Class II for Australia): (page 144-148, total 5 pages)
Appendix 9: Plug dimension tested according IRAM 2063: 2009 + IEC 60884-1: 2002 + A1:2006 (for Argentina): (page 149, total 1 page)

Summary of testing:

Tests performed (name of test and test clause):

Marking test	8.15
Protection against accessibility to hazardous live parts	9
Full-load output voltage test	11
No-load output voltage test	12
Heating test	14.2
Short-circuit & overload protection (Non-inherently short-circuit proof transformer)	15.3
Mechanical strength test - Impact test	16.2
Mechanical strength test - Direct plug-in transformer	16.4
IP test	17.1
Humidity	17.2
Insulation resistance test	18.2
Dielectric strength test	18.3
Touch current and protective earth conductor current	18.5
Impulse test	18.101
Torque to socket-outlet test (Direct plug-in equipment)	19.15
Overload protection devices test	20.11
Cord anchorage test	22.9.5
Creepage distances, clearances and distances through insulation measurement	26.1
Mandrel test	26.3.3
Ball pressure test	27.1
Glow wire test	27.3
Electronic circuits fault test	H.2.3
Dimensional check for integral plug	-

Testing location:

Building No. 86, 1198 Qinzhou Road (North)
200233 Shanghai CHINA

Summary of compliance with National Differences:

List of countries addressed

Group differences for CENELEC and national differences for Germany, United Kingdom, Australia and United States are considered.

☒ **The product fulfils the requirements of IEC 61558-2-16:2009 (First Edition) + A1:2013 used in conjunction with IEC 61558-1 (Second Edition) + A1:2009.**

Copy of marking plate:

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.

Label for direct plug-in model GT*41134-*:**

Label for direct plug-in model GT-41134-0606-W2-TAB:

Label for open frame type model:

Note 1: Other models have similar markings as above except different model name, ratings and some symbols.

Note 2: Symbol “IP20”, ⧈ and ⊖—⊙—⊕ are not applicable for open frame models. Output polarities also marked on PCB near output terminals for open frame models.

Test item particulars.....:	
Classification of installation and use.....:	Portable
Supply Connection.....:	Integral plug for direct plug-in models; Connector or appliance inlet for open frame models.
.....:	
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 .....:	2014-11-26
Date (s) of performance of tests.....:	2014-11-26 to 2014-12-11

General remarks:

"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.

Throughout this report a ☐ comma / ☒ point is used as the decimal separator.
Determination of the test result includes consideration of measurement uncertainty from the test equipment and methods.

Throughout this report, model GTM41134-0606-1.0, GTM41134-0648 and GT-41134-0606-W2-TAB were tested as typical models.

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:

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

Name and address of factory (ies) .....:	**1.** GlobTek (Suzhou) Co., Ltd Building 4, No. 76 JinLing East Road, Suzhou Industrial Park, Suzhou, JiangSu, 215021, China **2.** GlobTek, Inc. 186 Veterans Dr. Northvale, NJ 07647 USA

General product information:

The products covered by this report are switching power supplies for general purpose.

Transformers used in models of GT*41134-***-*** are with similar construction. The turns of secondary winding may be added or reduced according different output voltage. The whole coil of transformer for GT-41134-0606-W2-TAB is wrapped by copper film.
All models of GT*41134-***-*** have similar PCB, but PCB for models with "F", "FW" and "T" is longer than models without these letters due to input and output connectors or connection wires employed. Some non-critical components may be adjusted according different output voltage. The parameters of these components depend on output voltage.
Models with "F", "FW" and "T" are built-in power supply boards with open frame construction which contained connectors or appliance inlet. These models shall be installed and evaluated in end product.

Models of GT*41134-*** can use alternative detachable plug. Plug standard EN50075 for Europe, BS1363-3 for British, AS 3112 for Australia, ANSI/NEMA WD6-2002 for USA and IRAM 2063 for Argentina were considered in this report.

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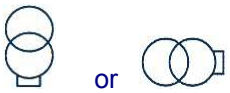
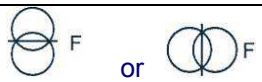
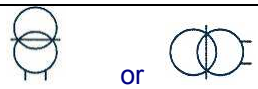
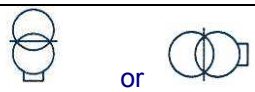
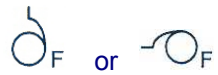
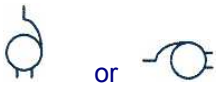
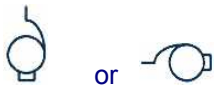
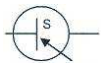
IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
8	**MARKING AND OTHER INFORMATION**		P
8.1	Transformer marked with:		P
	a) rated supply voltage or voltage range (V) .....:	See page 6 and 7	P
	b) rated output voltage (V) .....:	See page 6 and 7	P
	c) rated output (VA, kVA or W) .....:		N/A
	d) rated output current (A) .....:	See page 6 and 7	P
	e) rated frequency (Hz) .....:	See page 6 and 7	P
	f) rated power factor (if not 1) .....:		N/A
	g) symbol AC for alternating current, or DC for direct current-output	See page 6 and 7	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: 	P
	i) manufacturer's name or trademark or name of the responsible vendor	See page 6 and 7	P
	j) model or type reference	See page 6 and 7	P
	k) vector group according to IEC 60076 for three-phase transformer		N/A
	l) symbol for Class II	 See page 6 for direct plug-in model only.	P
	m) symbol for Class III		N/A
	n) index IPXX if other than IP00	See page 6	P
	o) rated max. ambient temperature ta (if not 25 °C) .....:	See page 6 and 7	P
	p) rated minimum ambient temperature ta 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 tw-marked transformers marked with the rated max. operating temperature, increased by multiples of 5 (e.g. tw 120; tw 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

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	– electrical function of the transformer		N/A
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		N/A
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:	Non-replaceable protective device only	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 .....:		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"	For open frame models with class I construction.	P
	Terminal for protective earth marked with earthing symbol	 For open frame models with class I construction.	P
	Identification of input terminals: "PRI"		N/A
	Identification of output terminals: "SEC"		N/A
	Symbol for any point/terminal in connection with frame or core		N/A
8.7	Indication for correct connection	See page 6	P
8.8	Instruction sheet for type X, Y, Z attachments	Type Z attachments for output cord for direct plug-in models.	P
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.	See page 6	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:		P
	Volts	V	P

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	Amperes	A (mA)	P
	Volt amperes (or volt-amperes reactive for reactors)	VA or (VAR)	N/A
	Watts	W	N/A
	Hertz	Hz	P
	Input	PRI	N/A
	Output	SEC	N/A
	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	⧈ For direct plug-in model only.	P
	Class III construction	III	N/A
	Fuse-link	F	N/A
	Rated max. ambient temperature	t_a	P
	Frame or core terminal	⏚	N/A
	Protective earth	⏚ For open frame models with class I construction.	P
	IP number	IP20 for directly plug-in model	P
	Earth (ground for functional earth)	⏚	N/A
	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**	F or F	N/A
	SMPS incorporating a **Non-short-circuit-proof separating transformer**	or	N/A

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	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
	SMPS incorporating a **Short-circuit-proof isolating transformer** (inherently or non-inherently)		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**		N/A
	SMPS incorporating a **Non-short-circuit proof auto-transformer**		N/A
	SMPS incorporating a **Short-circuit proof auto-transformer** (inherently or non-inherently)		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 switch	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		P
	Marking for terminals: no confusion between input and output		P
	Marking for interchangeable protective devices positioned adjacent to the base		N/A

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	Marking for interchangeable protective devices clearly discernible after removal of cover and protective device		N/A
8.14	Special information for installation (in the catalogue, data sheet, or instruction sheet) if necessary:		P
	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
	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)		P
	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:		P
	– it is separated from the supply by double or reinforced insulation		P

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	– 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.	Max. 49.01VDC (GTM41134-0648)	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:		P
	The touch current shall not exceed:		P
	– for a.c. 0,7 mA (peak)	0.031mA peak max. (GTM41134-0648)	P
	– for d.c. 2,0 mA (see Annex J)		N/A
	In addition, when a capacitor is connected to live parts:		—
9.1.1.2.1	discharge: < 45 µC (between 60 V and 15 kV)	0.0564 µC	P
9.1.1.2.2	energy: ≤ 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 accentual contact with hazardous live parts.	For direct plug-in models only. Open frame type power supplies shall be considered in end product condition.	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.	For direct plug-in models only. Open frame type power supplies shall be considered in end product condition.	P
	Hazardous live parts are not accessible after removal of detachable parts.	For direct plug-in models only. Open frame type power supplies shall be considered in end product condition.	P
	Hazardous live parts are not accessible after removal of detachable parts except for:	No lamp or fuse holder	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 acci-dental contact with hazardous live parts:	Such substance not used	N/A
	Shafts, handles, operating levers, knops are not hazardous live parts.	No such part	N/A
	Compliance is checked by inspection and by relevant tests according to IEC 60 529		P

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	Class II transformers and Class II parts of Class I construction are tested with the test pin (fig. 3)	For direct plug-in models only. Open frame type power supplies shall be considered in end product condition.	P
	Hazardous live parts shall not be touchable by test finger (fig. 2)		P
	for Class II transformers: metal parts separated by basic insulation from hazardous live parts not touchable by test finger		P
	hazardous live parts shall not be touchable with the test pin		P
9.1.3	Accessibility of non-hazardous live parts		P
	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 ≤ 35 V peak a.c. or ≤ 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 ≤ 250 V a.c., only one pole may be accessible		N/A
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.		P
	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.		N/A
	The following tests are required :		N/A
	If the nominal capacitance is ≤ 0,1 µF – no test is conducted.	No capacitor	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		N/A
	If the measured voltage is > 60 V ripple free d.c., the discharge must be ≤ 45 µC.		N/A
10	**CHANGE OF INPUT VOLTAGE SETTING**		P
	Voltage setting not possible to change without a tool	Cannot be changed	N/A
	Different rated supply voltages:		N/A
	– indication of voltage for which the transformer is set, is discernible on the transformer.		N/A

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
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):		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):		P
	a) inherently short-circuit proof transformers with one rated output voltage for output voltage: a.c. ≤10% ; d.c. ≤15%	(see appended table)	N/A
	b) inherently short-circuit proof transformers with one more than 1 rated output voltage for highest output voltage: a.c. ≤10%; d.c. ≤15%		N/A
	c) idem for other output voltages: a.c. ≤15%; d.c. ≤20%		N/A
	d) other transformers for output voltages: a.c. ≤5%; d.c. ≤10%	Non-inherently short-circuit proof transformers	P
12	**NO-LOAD OUTPUT VOLTAGE (see supplementary requirements in Part 2)**		P
	Remark: with rectifier measuring on both sides of the rectifier	The rectifier is not accessible to the user	N/A
12.101	The no load output voltage shall not exceed (IEC 61558-2-16:09):		P
	– For SMPS incorporating separating or autotransformers: 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
12.202	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 %	(see appended table)	P
13	**SHORT-CIRCUIT VOLTAGE**		N/A

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	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 ta±5 °C		—
	Type X, Y, Z attachments: 1 pull (5 N) to the connection windings	Type Z attachments for output cord for direct plug-in models.	P
	Upri (V): 1,1 times rated supply voltage loaded with rated impedance – for independent transformers	110V / 264V for GT*41134-***-***; 132V for GT-41134-0606-W2-TAB.	—
	Upri (V): 1,1 times rated supply voltage: with I sec (A), measured with rated impedance and 1,0 times of the rated supply voltage for others than independent transformers		—
	Type X, Y, Z attachments: 1 pull (5 N) to the connection windings	Type Z	P
	Max. temperature windings .....:	(see appended table)	P
	– Class A: ≤ 100 °C		N/A
	– Class E: ≤ 115 °C		N/A
	– Class B: ≤ 120 °C		P
	– Class F: ≤ 140 °C		N/A
	– Class H: ≤ 165 °C		N/A
	– other classes		N/A
	Temperature of external enclosures of stationary transformers:		N/A
	– metal: ≤ 70 °C		N/A
	– other material: ≤ 80 °C		N/A
	Temperature of external enclosure of stationary transformer ≤ 85 °C (not touchable with the IEC test finger)		N/A
	Temperature of external enclosures, handles, etc. of portable transformers:	For direct plug-in models only. Open frame type power supplies shall be considered in end product condition. (see appended table)	P
	– continuously held parts of metal: ≤ 55 °C		N/A
	– continuously held parts of other material: ≤ 75 °C		N/A

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	– not continuously held parts of metal: ≤ 60 °C		N/A
	– not continuously held parts of other material: ≤ 80 °C		P
	Temperature of terminals for external conductors ≤ 70 °C	(see appended table)	P
	Temperature of terminals of switches ≤ 70 °C		N/A
	Temperature of internal and external wiring:	(see appended table)	P
	– rubber: ≤ 65 °C		N/A
	– PVC: ≤ 70 °C		P
	Temperature of parts where safety can be affected:		N/A
	– rubber: ≤ 75 °C		N/A
	– phenol-formaldehyde: ≤ 105 °C		N/A
	– urea-formaldehyde: ≤ 85 °C		N/A
	– impregnated paper and fabric: ≤ 85 °C		N/A
	– impregnated wood: ≤ 85 °C		N/A
	– PVC, polystyrene and similar thermoplastic material: ≤ 65 °C		N/A
	– varnished cambric: ≤ 75 °C		N/A
	Temperature rise of supports ≤ 85 °C		P
	Temperature of printed boards:	(see appended table)	P
	– bonded with phenol-formaldehyde: ≤ 105 °C		N/A
	– melamine-formaldehyde: ≤ 105 °C		N/A
	– phenol-furfural: ≤ 105 °C		N/A
	– polyester: ≤ 105 °C		N/A
	– bonded with epoxy: ≤ 140 °C		N/A
	Electric strength between input and output windings (18.3, 1 min); test voltage (V) .....:	3640V 1min	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 > 1kHz		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		P
14.2.1	Class of isolating system (classified materials according to IEC 60 085 and IEC 60 216)	Class B	P
14.2.2	No classified material, or system but the measured temperature does not exceed the value of Class A		N/A

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
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 ≤ 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; Upri(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 ta and without changing position.	(see appended table)	P
	Supply voltage between 0,9 times and 1,1 times of the rated supply voltage		—
	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
	Wining 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

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	– 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)	Protected, no high temperature	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)		N/A
	– 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	For direct plug-in models only. Open frame type power supplies shall be considered in end product condition.	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		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
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. *If protected by a miniature fuses in accordance to IEC 60127, 1,5 times of the rated fuse, until steady state condition (in addition)*		P

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
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	Protected by electronic circuit in addition to fuse	P
	If an internal week 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		N/A
15.4	For non-short-circuit proof transformers: temperature rises ≤ 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		—
	– Upri (V): 1,1 times rated supply voltage .....:		—
	– Isec (A): 1,5 times rated output current .....:		—
	– time until steady-state conditions t1 (h) .....:		—
	– time until failure t2 (h): ≤ t1; ≤ 5 h .....:		N/A
15.5.2	During the test:		N/A
	– no flames, molten material, etc.		N/A
	– temperature of enclosure ≤ 175 °C		N/A
	– temperature of plywood support ≤ 125 °C		N/A
	After the test:		N/A
	– electric strength (Cl. 18, 1 min, test voltage: 35% of specified value); no flashover or break down 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

16	**MECHANICAL STRENGTH**		P
16.1	General	For direct plug-in models only. Open frame type power supplies shall be considered in end product condition.	P

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	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	No such part	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)	Direct plug-in	N/A
	For portable transformers: 100 falls, 25 mm		N/A
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	50 times Max. weight: 171g (GT-41134-0606-W2-TAB); 121g (GTM41134-0606-1.0)	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)	IP20 for direct plug-in models.	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:		P
	– dielectric strength test according to 18.3		P
	Inspection:		P

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	a) in dust-proof transformers no deposit of talcum powder		N/A
	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 ≥ 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		P
17.1.1	Tests on transformers with enclosure:		P
	A) Solid-object-proof transformers:		P
	- IP2X test finger (IEC 60 529) and test pin (fig. 3)		P
	B) Solid-object-proof transformers:		N/A
	- wire 2,5 mm; force 3 N		N/A
	- IP4X, wire 1 mm; force 1 N		N/A
	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

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	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 ≈360)		N/A
	F) Jet-proof transformer (IPX5) test according to fig. 6 of IEC 60 529 (nozzle 6,3mm)		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 ≤ IP20, 168 h for other transformers):	IP20, 48h	P
	– insulation resistance and electric strength (Cl. 18)		P

18	**INSULATION RESISTANCE AND ELECTRIC STRENGTH**		P
18.2	Insulation resistance between:		P
	– live parts and body for basic insulation ≥ 2 MΩ		N/A
	– live parts and body for reinforced insulation ≥ 7 MΩ	For direct plug-in models only. Open frame type power supplies shall be considered in end product condition. Input circuit and outer enclosure (rounded with metal foil): 199MΩ	P
	– input circuits and output circuits for basic insulation ≥ 2 MΩ		N/A
	– input circuits and output circuits for double or reinforced insulation ≥ 5 MΩ	Input circuit and output circuit: 199MΩ	P
	– each input circuit and all other input circuits connected together ≥ 2 MΩ		N/A
	– each output circuit and all other output circuits connected together ≥ 2 MΩ		N/A
	– hazardous live parts and metal parts with basic insulation (Class II transformers) ≥ 2 MΩ		N/A
	– body and metal parts with basic insulation (Class II transformers) ≥ 5 MΩ		N/A
	– metal foil in contact with inner and outer surfaces of enclosures ≥ 2 MΩ	For direct plug-in models only. Open frame type power supplies shall be considered in end product condition. 199MΩ	P

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
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) .....:	Working voltage: 240V Test voltage: 3640V	P
	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
	4) Reinforced insulation between the body and live parts; working voltage (V); test voltage (V) :	For direct plug-in models only. Open frame type power supplies shall be considered in end product condition. Working voltage: 240V Test voltage: 3640V	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)		N/A
18.101	Impulse test according Table F5 of IEC 60664-1 with 1,2/50 µs (IEC 61558-2-16)		P
	– After the test of 18.3, 10 impulses of each polarity between input and output terminals	4923V at sea level	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		P
	Partial discharge is ≤ 10 pC at time P2 See Fig. 19.101		P
18.5	Touch current and protective earth current		N/A
18.5.1	Touch current		P

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	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).	Max. 0.002mA	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	Class II for direct plug-in models, switch e in on position for open frame models with class I construction.	P
	– switch n: off and switch e: on		P
	– switch n: on and switch e: off	Class II for direct plug-in models, switch e in off position for open frame models with class I construction.	P
18.5.2	Protective earth conductor current	Open frame models with class I construction are component and shall be evaluated in end product condition.	N/A
	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		N/A
	The measured values are less than the required values of table 8b.		N/A

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

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
19.1.1.3	A polarity detecting device only energises the output in the case: output potential to earth ≤ rated output voltage, also with reversed input plug. (IEC 61558-2-16:2009)		N/A
	– The contact separation of the device is ≥ 3mm		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
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

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	– 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
	– 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):		N/A
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

IEC 61558-2-16			
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. (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
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, **no**t 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
	– 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

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	– 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 for direct plug-in models and for open frame models with class I construction shall be evaluated in end product condition.	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)	No connection for direct plug-in models and for open frame models with class I construction shall be evaluated in end product condition.	N/A
19.1.3.7	The distance between input and output terminals for the connection of external wiring is ≥ 25 mm	No such terminal, open frame models with class I construction shall be assembled in factory and do not for external wiring.	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)	No connection	P
19.1.3.10	Protective screening is not allowed for SMPS with plug connection to the mains (EN 61558-2-16:09)		N/A
19.2	Fiercely burning material not used	Such substance 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 conduit or metal sheath of supply wiring	N/A
19.5	Class II transformers: part of supplementary or reinforced insulation, during reassembly after routine servicing not omitted		P
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 ≤ 50% specified values (Cl. 26)		P

IEC 61558-2-16			
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	No such part	N/A
19.8	Resistors or capacitors connected between hazardous live parts and the body (accessible metal parts) consist of:	Two Y1 capacitors connected between input circuit and output circuit.	P
	– components according to IEC 60 065, 14.1 or capacitor Y1 according to IEC 60 384-14		P
	– at least two separate components		P
	– if one component is short-circuited or opened, values specified in Cl. 9 shall not be exceeded	0.039mA peak max. (GTM41134-0648)	P
	– 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) ≥ 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 ± 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.:	No such part	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:		P
	– 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:		N/A
	– distance through insulation according to table 13		N/A

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	– one additional layer of serrated tape, and		N/A
	– 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:		P
	• Multi-layer extruded or spirally wrapped insulation, passed the tests of annex K		P
	• Basic insulation: two wrapped or one extruded wire		N/A
	• Supplementary insulation: two layers, wrapped or extruded		N/A
	• Reinforced insulation: three layers wrapped or extruded		P
	Spirally wrapped insulation:		N/A
	• creepage distances between wrapped layers > cl. 26 _ P1 values		N/A
	• path between wrapped layers sealed, the test voltage of K2 is multiplied with 1,35		N/A
	• test 26.2.3 – Test A, passed for wrapped layers		N/A
	• 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
	• comply with annex K		N/A
	• two layers for supplementary insulation		N/A
	• one layer for basic insulation		N/A
	• 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:		P
	• comply with annex K	Certified triple insulated winding wire	P
	• three layers		P
	• relevant dielectric strength test of 18.3		P
	Where the insulated winding wire is wound:		P

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	• upon metal or ferrite cores		P
	• upon enamelled wire		P
	• under enamelled wire		P
	• 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
	• both windings shall not touch each other and also not the core.		P
	100 % routine test of Annex K3 of part 1 is fulfilled		N/A
	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		P
FIW	Transformers which use FIW wire		N/A
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
	• 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:		N/A
	• 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
	• 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
	• between FIW and enamelled wire, no requirements of creepage distances and clearances		N/A
	• 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

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	• 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
	• for primary and secondary winding FIW-wire for basic insulation is used		N/A
	• 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
	• no touch between the basic insulated PRI and SEC FIW-wires		N/A
	• 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
	• 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
	• 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
	• no touch between the FIW wire and the enamelled wire		N/A
	• 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)		N/A
	• 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
	• PRI or SEC basic insulated FIW wire and to the other winding (enamelled wire) requirements of supplementary insulation		N/A

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	• 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
	• upon metal or ferrite cores		N/A
	• 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
	• 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	No such part	N/A
19.14	Protection against electric shock: covers securely fixed, 2 independent fixing means, one with tool	For direct plug-in models only. Open frame type power supplies shall be considered in end product condition. Rim and ultrasonic welding	P
19.15	Transformer with pins for fixed socket-outlets: no strain on socket-outlet	For direct plug-in models only. Open frame type power supplies shall be considered in end product condition.	P
	Additional torque ≤ 0,25 Nm	Max 0.061 Nm (for model GTM41134-0606-1.0 equipped with BS plug)	P
19.16	Protection index for portable transformers:		P
	≤ 200 VA ≥ IP20 and instructions for use	IP20 for direct plug-in models	P
	> 200 VA ≤ 2,5 kVA ≥ IPX4 (single-phase)		N/A
	> 200 VA ≤ 6,3 kVA ≥ IPX4 (polyphase)		N/A
	> 2,5 VA (single-phase) ≥ IP21		N/A
	> 6,3 VA (polyphase) ≥ IP21		N/A
19.17	Transformers IPX1 - IPX6 totally enclosed, except for drain hole (diameter ≥ 5 mm or 20 mm² with width ≥ 3 mm); drain hole not required for transformer completely filled with insulating materials		N/A
19.18	Transformers ≥ 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	Only one SELV-circuit	N/A

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	– 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	No such connection	P
	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		N/A
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
	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:		P
	– 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).		P
	– Components without markings tested under transformer conditions including inrush current.		P
	– If no IEC standard exists, the component is tested under transformer conditions.		P
20.1	Appliance couplers for main supply shall comply with:	For GT*41134-***-FT3, GT*41134-***-FT3A and GT*41134-***-FWT2	P
	– IEC 60 320 for IPX0		P

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	– IEC 60 309 for other		N/A
20.2	Automatic controls shall comply with IEC 60 730-1	No control	N/A
20.3	Thermal-links comply with IEC 60691	No thermal-link	N/A
20.4	Switches shall comply with annex F	No switch	N/A
	Disconnection from the supply:		P
	– by a switch, disconnecting all poles of the supply (full disconnection under the relevant overvoltage category		N/A
	– or a flexible supply cable and cord with plug	With integral plug for direct plug-in models. Open frame type power supplies shall be considered in end product condition.	P
	– 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.	For direct plug-in models.	P
	Plugs and socket-outlets for SELV systems with both a rated current ≤ 3A and a rated voltage ≤ 24 V shall comply with following:		P
	SELV plug and socket-outlets shall comply with IEC 60 884-2-4 and IEC 60 906-3		N/A
	– It is not possible for plugs to enter socket-outlets of other standardised voltage system		P
	– Socket outlets do not accommodate plugs of other standardised voltage systems		P
	– Socket outlets do not have a protective earth contact		P
	PELV 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
	– 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

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
20.6	Thermal cut-outs, overload releases etc. have adequate breaking capacity	For current fuse	P
	– 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		P
20.6.1	For Fuses According IEC 60127 and IEC 60269, the fuse current does not exceed 1,1 times of the rated value	Rated current: 1A for GT*41134-***-*** and 6.3A for GT-41134-0606-W2-TAB. Max. measured current in normal use: 0.143A (GTM41134-0606-1.0), 0.128A (GT-41134-0606-W2-TAB)	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
	c) Thermal cut outs with manual rest 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

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	– ratings according IEC 60730-1, cl. 5		N/A
	– classification according to:		N/A
	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:		N/A
	– at least micro-interruption or micro-disconnection (IEC 60730-1)		N/A
	– 300 h aged at ta (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		N/A
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 ta min		N/A
	– 3 cycles at ta min for transformers with ta 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

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	– 48 h at 25° C for transformers without ta min		N/A
	– 24 h at ta and 24 h at ta min for transformers with ta 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:		N/A
	5 cycles: transformer short-circuited for 48 h by 1,1 times of the input voltage and max. ta		N/A
	5 cycles: transformer short-circuited for 48 h by 0,9 times of the input voltage and min. ta (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.		N/A
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:		N/A
	– ageing test 300 h by 35 °C or ta + 10 °C		N/A
	– After transformer fault condition the thermal link operate without sustaining arcing		N/A
	– after opening the thermal-link shall have an insulation resistance of at least 0,2 M		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
20.9	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.	110V / 264V for GT*41134-***-***; 132V for GT-41134-0606-W2-TAB.	P

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
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 1,5 mm) or bushings of insulating material		N/A
21.3	Bare conductors: distances adequately maintained		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		N/A
22	**SUPPLY CONNECTION AND EXTERNAL FLEXIBLE CABLES AND CORDS**		P
22.1	All cables, flexible cords etc. shall have appropriate current and voltage ratings	For direct plug-in models with output cord: type Z	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		N/A
	Input and output wiring inlet and outlet openings for flexible cables or cords: insulating material or bushing of insulating material		N/A
	Bushings for external wiring: reliably fixed, not of rubber unless part of cord guard		N/A
22.3	Fixed transformer:		N/A
	– 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
	– 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” $\geq$ IPX0:		N/A
	– for transformers with a mass $\leq$ 3 kg: 60227 IEC52 (H03VV-..) (60245 IEC 53)		N/A
	– for transformers with a mass > 3 kg: 60227 IEC53 (H05VV-..) or 60245 IEC 53		N/A

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	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:		N/A
	– cord set fitted with an appliance coupler in accordance with IEC 60320		N/A
22.7	Nominal cross-sectional area (mm²); 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		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		N/A
22.9	Type X, Y or Z attachments: see relevant part 2	Type Z	P
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	For output cord	P
	Insulation between conductor and enclosure:		N/A
	– 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		P
22.9.3	Inlet bushings:		P
	– no damage to power supply cord	No damage to output cord	P
	– reliably fixed		P
	– not removable without tool		P
	– not integral with power supply cord (for type X attachment)		N/A
	– not of natural rubber except for Class I trans-former with type X, Y and Z attachments		P
22.9.4	For portable transformers which are moved while operating:		N/A
	– cord guards, if any, of insulating material and fixed		N/A
	Compliance is tested by the oscillating test according to fig. 7:		N/A
	– 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

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	After the test according to fig. 7:		N/A
	– 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:		N/A
	– 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
	Cord anchorages for type X, Y, Z attachments: cores of power external flexible cable or cord insulated from accessible metal parts by:	Type Z	P
	– 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		P

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	Cord anchorages for type X and Y attachments:	Type Z	N/A
	– 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	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) .....:	Max. 0.171kg; 30N; 0,1Nm	—
	– 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 ≤ values specified in Cl. 26		P
22.9.6	Space for external cords or cable for fixed wiring and for type X and Y attachments:	Type Z	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
	– 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

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	– possibility of access to terminal for external conductor after removal of covers without special purpose tool		N/A
23	**TERMINALS FOR EXTERNAL CONDUCTORS**		P
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	Terminals incorporated in open frame type power supplies shall be considered in end application.	N/A
	Terminals are integral part of the transformer:		N/A
	– comply with IEC 60 999-1 under transformer conditions		N/A
	Other terminals:		N/A
	– 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 ≥ 50% of specified value (Cl. 26)		N/A
	Transformer with type Y and Z attachments for external conductors: soldered, welded, crimped, etc. connections allowed	For direct plug-in models: Soldered	P
	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 ≥ 50% of specified value (Cl. 26)	For direct plug-in models: Glue used	P
23.2	Terminals for type X with special cords Y and Z attachments shall be suitable for their purpose:	For direct plug-in models	P
	– test by inspection according to 23.1 and 23.2		P
	– pull of 5 N to the connection before test according to 14.1		P
23.3	Other terminals than Y and Z attachments shall be so fixed that when the clamping means is tightened or loosened:		N/A
	– terminal does not work loose		N/A
	– internal wiring is not subjected to stress		N/A

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	– 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:		N/A
	– 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):		N/A
	– 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:		N/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:		N/A
	– 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
24.1	Class I transformers: accessible conductive parts connected to earth terminal	Open frame type, shall be considered in end product.	N/A
	Class II transformers: no provision for earth	For direct plug-in models	P

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
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 ≤ 0,1 Ω 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:		N/A
	– 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 such screws	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	No such screws	N/A
	Screws not of insulating material if their replacement by metal screws can impair supplementary or reinforced insulation	No such screws	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	No screws can be removed	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 ≥ 3 mm + 1/2 screw diameter or 8 mm		N/A
	– correct introduction into screw hole		N/A

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
25.3	Electrical connections: contact pressure not transmitted through insulating material	No electrical connection	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	No such screws	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	No such screws	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	Pollution degree 2	P
	– all isolating material are classified acc. to IEC 60085 and IEC 60216		P
	– values of pollution degree 1 are not applicable		P
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

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	Test A		N/A
	– thermal class		N/A
	– working voltage		N/A
	– Test with three specially specimens, with uninsulated wires, without impregnation or potting		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 µs 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.		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 µs waveform) – see Annex R of IEC 61558-1		N/A

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
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)		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 µs 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	Comply with 19.12.3	N/A
	The insulation fulfil the material classification according IEC 60085 or 60216 or the test of 14.3	Class B	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 ≥0,2 mm		N/A

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	– Minimum thickness of supplementary insulation ≥0,1 mm		N/A
26.3.2	Insulation in thin sheet form		P
	– If the layers are non-separable (glued together):		N/A
	– 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:		P
	– The requirement of 2 layers is fulfilled		P
	– 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:		P
	– rated output > 100 VA values in square brackets apply		N/A
	– rated output ≥ 25 VA ≤ 100 VA 2/3 of the value in square brackets apply		N/A

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	– rated output ≤ 25 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):		P
	– 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
	– If the layers are separable 1 of at least 2 layers fulfil the test:		P
	– pull force of 50 N		P
	– 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.	5000V	P
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	240Vrms max.	P
	– rated supply frequency 50/60 Hz	50-60Hz	P
	– rated internal frequency		N/A
	1. Insulation between input and output circuits (basic insulation):		N/A
	a) measured values ≥ specified values (mm) .....:		N/A
	2. Insulation between input and output circuits (double or reinforced insulation):		P
	a) measured values ≥ specified values (mm) .....:	Input to output: CI/Cr: Min.6.2mm > 4.8mm	P
	b) measured values ≥ specified values (mm) .....:		N/A

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	c) measured values ≥ specified values (mm) .....:	TIW used as secondary winding and 2 layers of insulation tape between Pri. and Sec. winding, each layer 0.05mm; Comply with 19.12.3	P
	3. Insulation between adjacent input circuits: measured values ≥ specified values (mm) :		N/A
	Insulation between adjacent output circuits: measured values ≥ specified values (mm) .:		N/A
	4. Insulation between terminals for external connection:		N/A
	a) measured values ≥ specified values (mm) .....:		N/A
	b) measured values ≥ specified values (mm) .....:		N/A
	c) measured values ≥ specified values (mm) .....:		N/A
	1. Basic or supplementary insulation:		P
	a) measured values ≥ specified values (mm) .....:	L/N/Earthing before fuse: Cl/Cr: Min.3.40mm > 2.44mm Opposite polarity of fuse: Cl/Cr: Min.3.00mm > 2.44mm	P
	b) measured values ≥ specified values (mm) .....:		N/A
	c) measured values ≥ specified values (mm) .....:		N/A
	d) measured values ≥ specified values (mm) .....:		N/A
	e) measured values ≥ specified values (mm) .....:		N/A
	6. Reinforced or double insulation: measured values ≥ specified values (mm) .....:	Input to outer enclosure (for direct plug-in models): Cl/Cr: Min.5.8mm > 4.8mm Live contact to external edge for all types plug: Cl/Cr: Min.5.5mm > 4.8mm	P
	7. Distance through insulation:		P
	a) measured values ≥ specified values (mm) .....:		N/A
	b) measured values ≥ specified values (mm) .....:	2-layer insulating tapes with total thickness: 0.10mm > 0.041mm; according to 19.12.3 and 26.3.2	P

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	c) measured values ≥ specified values (mm) .....:	Input to outer enclosure: 2.0mm > 0.8mm	P
26.102	Values of IEC 61558-2-16 applicable for frequency up to 3 MHz (EN 61558-2-16:09)	Measured frequency: 53.7kHz	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 ≥ 30 kHz according figure 101 two determinations are necessary:		P
	– determination based on peak working voltage according Table 104 :		P
	Peak working voltage	356V peak max.	P
	Basic insulation: required / measured		N/A
	Double or reinforced insulation: required / measured value	Input to output: 0.11mm / 6.2mm min. Input to outer enclosure: 0.06mm / 5.8mm min.	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
	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)	Required (DI/RI): 4.5mm	P
	The minimum clearance is the greater of the two values.	4.5mm is the greater	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 µsec peaks EN 61558-2-16:09)		P

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	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)		P
	– determination based on measured peak working voltage according Tables 105 to 110		P
	Peak working voltage	356V peak max.	P
	Pollution degree	2	P
	Basic or supplementary insulation: required / measured		N/A
	Double or reinforced insulation: required / measured value	Input to output: 0.32mm / 6.2mm min. Input to outer enclosure: 0.24mm / 5.8mm min.	P
	– determination based on measured r.m.s. working voltage according Tables 13, C1 and D1 (see clause 26.101)	Required (DI/RI): 4.8mm	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	4.8mm is the greater	P
26.106	Distance through insulation (EN 61558-2-16:09)		N/A
	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 ≥ 0,75 the peak value of the field strength is ≤ 2 kV/mm		N/A
	For thin layers d2 ≤ 30 µm 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
26.107 (A1)	For transformers with FIW wires the following test is required		N/A
	• 10 cycles are required		N/A

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	• 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
	• 1 h at 25° C		N/A
	• 2 h at 0° C		N/A
	• 1 h at 25° C – (next cycle start again with 68 h max winding temp + 10)		N/A
	• during the 10 cycles test 2 x working voltage is connected between PRI and SEC		N/A
	• 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
	• 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
	• 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		P
	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	Output connector	P
27.1.1	External accessible parts		P
	The Ball-pressure test -: diameter of impression ≤ 2 mm; heating cabinet temperature (°C) at 70 ° C or the temperature T of 14.1 (T + 15) - is fulfilled.	Enclosure for direct plug-in models (same as blade holder): 125°C, 1.2mm (SE1X), 1.2mm (SE1), 1.2mm (SE100), 1.4mm (C2950), 1.4mm (CX7211), 1.4mm (EXCY0098), 1.2mm (LN-1250P), 1.2mm (LN-1250G), 1.2mm (PA-765A(+)),1.2mm (PC-540)	P
27.1.2	Internal parts		P

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	For insulating material retaining current carrying parts in position , the ball-pressure test -: diameter of impression ≤ 2 mm; heating cabinet temperature (°C) at 125 ° C or the temperature T of 14.1 (T + 15) - is fulfilled	PCB: 125°C, 0.7mm (T2A / T2B / T4 / CEM1 / 2V0 / FR4 03 / 03A / DS2 / YLH-1 / 02V0 / 04V0 / DKV0-3A / DGV0-3A / C-2 / C-2A / TCX / PW-02 / PW-03) Appliance inlet: 125°C, 1.0mm (DB-6, R-30790, R-307, S-02, DB-14, R-301SN, S-03, DB-8, R-201SN90, S-01); 125°C, 1.1mm (TU-333, RF-190, 0724, CDJ-2, TU-301-S, TU-301-SP, SS-120, 0711, SO-222, RF-180, 0721, CDJ-8) Connector: 125°C, 1.6mm	P
27.2	Resistance to abnormal heat under fault conditions		N/A
27.3	Resistance to fire		P
	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		P
27.3.1	External accessible parts (glow wire tests)		P
	– 650° C for enclosures	Enclosure, same as blade holder and tested at 750° C (see appended table)	P
	– 650 ° C for parts retaining current carrying parts in position and terminals for external conductors Current ≤ 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	Blade holder for direct plug-in models (see appended table)	P
	– 850° C for parts retaining current carrying parts in position and terminals for external conductors with non-fixed wiring. Current > 0,2 A	Connector, appliance inlet (see appended table)	P
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)	Bobbin (see appended table)	P
	– 650 ° C for parts retaining current carrying parts in position and terminals for external conductors. Current ≤ 0,2 A	Connector: tested at 850° C	P
	– 750° C for parts retaining current carrying parts in position and terminals for external conductors with fixed wiring. Current > 0,2 A		N/A

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	– 850° C for parts retaining current carrying parts in position and terminals for external conductors with non-fixed wiring. Current > 0,2 A	Connector (see appended table)	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
28	**RESISTANCE TO RUSTING**		P
	Ferrous parts protected against rusting	Input and output connection are galvanized	P

IEC 61558-1			
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:		P
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 60695-2-11apply, 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

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
H.2.1	Circuits designed and applied so that fault conditions do not render the appliance unsafe		P
	During and after each test:		P
	– 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		N/A
	– 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:		P
	a) short-circuit of creepage distances and clearances, if less than specified in Cl. 26		N/A
	b) open circuit at the terminals of any component	Evaluated	P
	c) short-circuit of capacitors, unless they comply with IEC 60 384-14	C1, C6 (GT-41134-0606-W2-TAB); C1, C5 (GTM41134-0606-1.0 and GTM41134-0648)	P
	d) short-circuit of any two terminals of an electronic component as specified	BD1, D6, Q1 (GT-41134-0606-W2-TAB); D1, D5, D6, Q1 (GTM41134-0606-1.0 and GTM41134-0648)	P
	e) any failure of an integrated circuit as specified		N/A
	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		P
	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 I1 is used, current I2 is measured as specified:		P

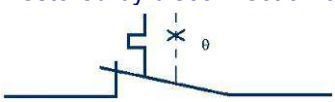
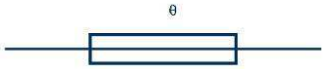
IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	– if I2 < 2,1 x I1 test of 15.8 is repeated with fuse-link short-circuited		N/A
	– if I2 > 2,75 x I1, no other tests are necessary		P
	If I2 > 2,1 x I1 and I2 < 2,75 x I1 test of 15.8 is re-peated as specified		N/A
	For fuses other 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		N/A
H.3.1	For live parts separated by basic insulation smaller cr and cl as in 26 are allowed, if H2 is fulfilled.		N/A
	In optocouplers no requirements of cr and cl		N/A
	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		N/A
K (A1)	**ANNEX K, INSULATED WINDING WIRES FOR USE AS MULTIPLE LAYER INSULATION**		N/A
K.1	Wire construction:		N/A
	• insulated winding wire for basic or supplementary insulation (see 19.12.3)		N/A
	• insulated winding wire for reinforced insulation (see 19.12.3)		N/A
	• splid circular winding wires and stranded winding wires with 0,05 to 5 mm diameter		N/A
	• 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

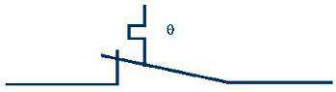
IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	Test samples prepared according to clause 4.4.1 of IEC 60851-5:2008 (twisted pair)		N/A
	Dielectric strength test: 6 kV for reinforced insulation		N/A
	Dielectric strength test: 3 kV for basic or supplementary insulation		N/A
K.2.2.2	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/mm² (118 MPa)		N/A
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
	• high voltage test immediately after this test		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.2.5	Retention of dielectric strength after bending (test as specified under test 13 of 4.6.1 c) of IEC 60 851-5)		N/A
			N/A

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	• high voltage test immediately after this test • Dielectric strength test: 5,5 kV for reinforced insulation • Dielectric strength test: 2,75 kV for basic or supplementary insulation		N/A
K.3.1	General Tests as subjected in K.3.2 and K.3.3		N/A
K.3.2	Routine test		N/A
	• Dielectric strength test: 4,2 kV for reinforced insulation		N/A
	• 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
	• Dielectric strength test: 6 kV for reinforced insulation		N/A
	• 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
	• Dielectric strength test: 5,5 kV for reinforced insulation		N/A
	• Dielectric strength test: 3 kV for basic or supplementary insulation		N/A
U	**ANNEX U – INFORMATIVE – OPTIONAL TW – MARKING FOR TRANSFORMERS**		N/A
	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

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

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

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
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
GTM41134-0606-1.0 / 5VDC, 1.2A	100V	5.09	+1.80	5.04	-0.98	For Clause 11: Required ±10% For Clause 12: Required 20%
	240V	5.09	+1.80	5.04	-0.98	
GTM41134-0648 / 48VDC, 0.125A	100V	47.69	-0.65	49.01	+2.77	
	240V	47.86	-0.29	48.96	+2.30	
GT-41134-0606-W2-TAB / 6VDC, 1A	120V	6.06	+1.00	6.21	+2.48	

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

14	**TABLE: Heating Test**		**P**
	Test voltage (V)..... :	110 / 264	—
	Ambient (°C)..... :	22	—
	Model..... :	GTM41134-0606-1.0	

Thermocouple Locations	**max. temperature measured, (°C)**	**max. temperature limit, (°C)**
External surface	14 / 11	40
Internal surface	16 / 16	For ball pressure
Support	8 / 8	45
Output cord	3 / 3	40 (T80)
Internal output wire	9 / 9	40 (T80)
Varistor	18 / 15	45 (T85)
Y capacitor	32 / 29	45 (T85)
Connector	16 / 16	30
Transformer winding	46 / 45	70
PCB	32 / 32	90 (T130)
Note: The requirement values are considered under ta:40°C.		

14	**TABLE: Heating Test**		**P**
	Test voltage (V)..... :	110 / 264	—
	Ambient (°C)..... :	21	—
	Model..... :	GTM41134-0648	

Thermocouple Locations	**max. temperature measured, (°C)**	**max. temperature limit, (°C)**
External surface	16 / 18	40
Internal surface	20 / 22	For ball pressure
Support	2 / 3	45
Output cord	5 / 5	40 (T80)
Internal output wire	13 / 14	40 (T80)
Varistor	19 / 18	45 (T85)
Y capacitor	20 / 21	45 (T85)
Transformer winding	43 / 47	70
PCB	25 / 27	90 (T130)
Note: The requirement values are considered under ta:40°C.		

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

14	**TABLE: Heating Test**		**P**
	Test voltage (V)..... :	132	—
	Ambient (°C)..... :	21	—
	Model..... :	GT-41134-0606-W2-TAB	

Thermocouple Locations	**max. temperature measured, (°C)**	**max. temperature limit, (°C)**
External surface	16	30
Internal surface	17	For ball pressure
Support	10	35
Output cord	6	30 (T80)
Internal input wire	10	30 (T80)
Internal output wire	15	30 (T80)
Varistor	5	35 (T85)
Y capacitor	29	35 (T85)
Transformer winding	42	60
PCB	25	80 (T130)
Note: The requirement values are considered under ta:50°C.		

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

15	TABLE: SHORT-CIRCUIT AND OVERLOAD PROTECTION						P
	ambient temperature (°C) .....:		21				
type/rated output	r-cold Ω	r-warm Ω	temp. °C	ext. encl. °C	support °C	int. + ext. wire	further information
GTM41134-0606-1.0 / 5VDC, 1.2A	-	-	97 / 85	41 / 38	37 / 33	35 / 36	Tested at 90V / 264V supply
GTM41134-0648 / 48VDC, 0.125A	-	-	103 / 114	52 / 55	27 / 28	46 / 47	Tested at 90V / 264V supply
GT-41134-0606-W2-TAB / 6VDC, 1A	-	-	88 / 82	45 / 44	37 / 35	43 / 42	Tested at 108V / 132V supply
Note 1: 40°C ambient temperature for GTM41134-0606-1.0 and GTM41134-0648 and 50°C ambient temperature for GT-41134-0606-W2-TAB were considered. Note 2: All data recorded in above are under overload condition and products protected immediately under short-circuit condition.							

18.2	TABLE: INSULATION RESISTANCE MEASUREMENTS	P
Insulation resistance R between:	R (MΩ)	Required R (MΩ)
Between input circuit and output circuit	199	5
Between input and body (for direct plug-in models)	199	7
Between two metal foils in contact with the inner and outer surfaces of enclosure (for direct plug-in models)	199	7
Supplementary information:		

18.3	TABLE: DIELECTRIC STRENGTH	P
Test voltage applied between:	Test potential applied (V)	Breakdown / flashover (Yes/No)
Between input circuit and output circuit	3640	No
Between input and body (for direct plug-in models)	3640	No
Supplementary information:		

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

20.1	Table: Component				P
Object / part No.	Manufacturer/ trademark[2)]	Type / model[2)]	Technical data	Standard	Mark(s) of conformity[1)]
Enclosure and Blade holder	SABIC INNOVATIVE PLASTICS B V	SE1X (UL E45329)	PPE+PS, V-1, HWI 0, HAI 0, 105°C, min thickness: 2.0mm	IEC 61558-2-16	Tested with appliance
Alt. use	SABIC INNOVATIVE PLASTICS B V	SE1 (UL E45329)	PPE+PS, V-1, HWI 1, HAI 2, 105°C, min thickness: 2.0mm	IEC 61558-2-16	Tested with appliance
Alt. use	SABIC INNOVATIVE PLASTICS B V	SE100 (UL E45329)	PPE+PS, V-1, HWI 2, HAI 0, 95°C, min thickness: 2.0mm	IEC 61558-2-16	Tested with appliance
Alt. use	SABIC INNOVATIVE PLASTICS B V	C2950 (UL E45329)	PC/ABS, V-0, HWI 3, HAI 0, 85°C, min thickness: 2.0mm	IEC 61558-2-16	Tested with appliance
Alt. use	SABIC INNOVATIVE PLASTICS B V	CX7211, EXCY0098 (UL E45329)	PC/ABS, V-0, 5VB, HWI 2, HAI 0, 90°C, min thickness: 2.0mm	IEC 61558-2-16	Tested with appliance
Alt. use	TEIJIN CHEMICALS LTD	LN-1250P, LN-1250G (UL E50075)	PC, V-0, HWI 3, HAI 0, 115°C, min thickness: 2.0mm	IEC 61558-2-16	Tested with appliance
Alt. use	CHI MEI CORPORATION	PA-765A(+) (UL E56070)	ABS, V-0, 5VB, HWI 3, HAI 0, 80°C, min thickness: 2.0mm	IEC 61558-2-16	Tested with appliance
Alt. use	CHI MEI CORPORATION	PC-540 (UL E56070)	PC/ABS, V-0, HWI 3, HAI 3, min thickness: 2.0mm	IEC 61558-2-16	Tested with appliance
Internal wire	DONGGUAN YUE YANG WIRE & CABLE CO LTD	1007 / 1015 / 1185 / 2464 / 2468 (UL E230810)	Min. 18AWG, 300V, 80°C	IEC 61558-2-16	Tested with appliance
Alt. use	YONG HAO ELECTRICAL INDUSTRY CO LTD	1007 / 1015 / 1185 / 2464 / 2468 (UL E240426)	Min. 18AWG, 300V, 80°C	IEC 61558-2-16	Tested with appliance
Alt. use	HIP TAI ELECTRIC WIRE CO	1007 / 1015 / 1185 / 2464 / 2468 (UL E225804)	Min. 18AWG, 300V, 80°C	IEC 61558-2-16	Tested with appliance
Alt. use	KUNSHAN NEW ZHICHENG ELECTRONICS TECHNOLOGIES CO LTD	1007 / 1015 / 1185 / 2464 / 2468 (UL E237831)	Min. 18AWG, 300V, 80°C	IEC 61558-2-16	Tested with appliance
Alt. use	SHENG YU ENTERPRISE CO LTD	1007 / 1015 / 2464 / 2468 (UL E219726)	Min. 18AWG, 300V, 80°C	IEC 61558-2-16	Tested with appliance
Alt. use	SUZHOU YEMAO ELECTRONIC CO LTD	1007 / 1015 / 1185 / 2464 / 2468 (UL E353532)	Min. 18AWG, 300V, 80°C	IEC 61558-2-16	Tested with appliance

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

20.1	Table: Component				P
Object / part No.	Manufacturer/ trademark[2)]	Type / model[2)]	Technical data	Standard	Mark(s) of conformity[1)]
Alt. use	SUZHOU HONGMENG ELECTRONIC CO LTD	1007 / 1015 / 1185 / 2464 / 2468 (UL E315421)	Min. 18AWG, 300V, 80°C	IEC 61558-2-16	Tested with appliance
Alt. use	ZHUANG SHAN CHUAN ELECTRICAL PRODUCTS (KUNSHAN) CO LTD	1007 / 1015 / 1185 / 2464 / 2468 (UL E333601)	Min. 18AWG, 300V, 80°C	IEC 61558-2-16	Tested with appliance
Output cord	DONGGUAN YUE YANG WIRE & CABLE CO LTD	1185 / 2464 / 2468 (UL E230810)	Min. 24AWG, 300V, 80°C	IEC 61558-2-16	Tested with appliance
Alt. use	YONG HAO ELECTRICAL INDUSTRY CO LTD	1185 / 2464 / 2468 (UL E240426)	Min. 24AWG, 300V, 80°C	IEC 61558-2-16	Tested with appliance
Alt. use	DONGGUAN GUNEETAL WIRE & CABLE CO LTD	1185 / 2464 / 2468 (UL E204204)	Min. 24AWG, 300V, 80°C	IEC 61558-2-16	Tested with appliance
Alt. use	HIP TAI ELECTRIC WIRE CO	1185 / 2464 / 2468 (UL E225804)	Min. 24AWG, 300V, 80°C	IEC 61558-2-16	Tested with appliance
Alt. use	KUNSHAN NEW ZHICHENG ELECTRONICS TECHNOLOGIES CO LTD	1185 / 2464 / 2468 (UL E237831)	Min. 24AWG, 300V, 80°C	IEC 61558-2-16	Tested with appliance
Alt. use	SHENG YU ENTERPRISE CO LTD	2464 / 2468 (UL E219726)	Min. 24AWG, 300V, 80°C	IEC 61558-2-16	Tested with appliance
Alt. use	SUZHOU HONGMENG ELECTRONIC CO LTD	1185 / 2464 / 2468 (UL E315421)	Min. 24AWG, 300V, 80°C	IEC 61558-2-16	Tested with appliance
Alt. use	ZHUANG SHAN CHUAN ELECTRICAL PRODUCTS (KUNSHAN) CO LTD	1185 / 2464 / 2468 (UL E333601)	Min. 24AWG, 300V, 80°C	IEC 61558-2-16	Tested with appliance
PCB	TECHNI TECHNOLOGY LTD	T2A / T2B / T4 (UL E154355)	V-0, 130°C, min thickness: 1.6mm	IEC 61558-2-16	Tested with appliance
Alt. use	DONGGUAN HE TONG ELECTRONICS CO LTD	CEM1 / 2V0 / FR4 (UL E243157)	V-0, 130°C, min thickness: 1.6mm	IEC 61558-2-16	Tested with appliance
Alt. use	CHEERFUL ELECTRONIC (HK) LTD	03 / 03A (UL E199724)	V-0, 130°C, min thickness: 1.6mm	IEC 61558-2-16	Tested with appliance

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

20.1	Table: Component				P
Object / part No.	Manufacturer/ trademark[2)]	Type / model[2)]	Technical data	Standard	Mark(s) of conformity[1)]
Alt. use	DONGGUAN DAYSUN ELECTRONIC CO LTD	DS2 (UL E251754)	V-0, 130°C, min thickness: 1.6mm	IEC 61558-2-16	Tested with appliance
Alt. use	SUZHOU CITY YILIHUA ELECTRONICS CO LTD	YLH-1 (UL E251781)	V-0, 130°C, min thickness: 1.6mm	IEC 61558-2-16	Tested with appliance
Alt. use	SHANGHAI AREX PRECISION ELECTRONIC CO LTD	02V0 / 04V0 (UL E186016)	V-0, 130°C, min thickness: 1.6mm	IEC 61558-2-16	Tested with appliance
Alt. use	BRITE PLUS ELECTRONICS (SUZHOU) CO LTD	DKV0-3A / DGV0-3A (UL E177671)	V-0, 130°C, min thickness: 1.6mm	IEC 61558-2-16	Tested with appliance
Alt. use	KUOTIANG ENT LTD	C-2 / C-2A (UL E227299)	V-0, 130°C, min thickness: 1.6mm	IEC 61558-2-16	Tested with appliance
Alt. use	SHENZHEN TONGCHUANGXIN ELECTRONICS CO LTD	TCX (UL E250336)	V-0, 130°C, min thickness: 1.6mm	IEC 61558-2-16	Tested with appliance
Alt. use	PACIFIC WIN INDUSTRIAL LTD	PW-02 / PW-03 (UL E228070)	V-0, 130°C, min thickness: 1.6mm	IEC 61558-2-16	Tested with appliance
Current fuse (F1, F2)	Conquer Electronics Co., Ltd.	MST series	T1AL250V for GT*41134-***-*** and T6.3AL250V for GT-41134-0606-W2-TAB	IEC 60127-1 IEC 60127-3	VDE/ 40017118
Alt. use	Ever Island Electric Co., Ltd. And Walter Electric	2010 Serie(s)	T1AL250V for GT*41134-***-*** and T6.3AL250V for GT-41134-0606-W2-TAB. The whole fuse including pigtail leads shall be wrapped with UL approved heat shrinkable tubing.	IEC 60127-1 IEC 60127-3	VDE/ 40018781
Alt. use	Bel Fuse Ltd.	RST-Serie(s)	T1AL250V for GT*41134-***-***	IEC 60127-1 IEC 60127-3	VDE/ 40011144
Alt. use	Bel Fuse Ltd.	RST-Serie(s)	T6.3AL250V for GT-41134-0606-W2-TAB	IEC 60127-1 IEC 60127-3	VDE/ 40028321

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

20.1	Table: Component				P
Object / part No.	Manufacturer/ trademark[2)]	Type / model[2)]	Technical data	Standard	Mark(s) of conformity[1)]
Alt. use	Cooper Bussmann LLC	SS-5	T1AL250V for GT*41134-***-*** and T6.3AL250V for GT-41134-0606-W2-TAB	IEC 60127-1 IEC 60127-3	VDE/ 40015513
Alt. use	Walter Electronic Co. Ltd.	ICP-Series	T1AL250V for GT*41134-***-*** and T6.3AL250V for GT-41134-0606-W2-TAB. The whole fuse including pigtail leads shall be wrapped with UL approved heat shrinkable tubing.	IEC 60127-1 IEC 60127-3	VDE/ 40012824
Alt. use	Das & Sons International Ltd.	385 T Serie(s)	T1AL250V for GT*41134-***-*** and T6.3AL250V for GT-41134-0606-W2-TAB	IEC 60127-1 IEC 60127-3	VDE/ 40008524
Alt. use	Shenzhen Lanson Electronics	SMT T1A250V	T1AL250V for GT*41134-***-***	IEC 60127-1 IEC 60127-3	VDE/ 40012592
Alt. use	Shenzhen Lanson Electronics	3K T6.3A250V	T6.3AL250V for GT-41134-0606-W2-TAB only. The whole fuse including pigtail leads shall be wrapped with UL approved heat shrinkable tubing.	IEC 60127-1 IEC 60127-3	VDE/ 40010682
Y capacitor (CY1, CY2, optional)	TDK-EPC Corporation, Capacitors Group Circuit Devices Business Group	CD	Y1, 250V, max 470pF, 25/085/21/B	IEC/EN 60384-14	VDE/ 138526
Alt. use	Success Electronics Co., Ltd.	SB	Y1, 250/500V, max 470pF, 30/125/56/C	IEC/EN 60384-14	VDE/ 40037221
Alt. use	Success Electronics Co., Ltd.	SE	Y1, 250/500V, max 470pF, 30/125/56/C	IEC/EN 60384-14	VDE/ 40037211
Alt. use	Murata Mfg. Co., Ltd.	KX	Y1, 250V, max 470pF, 25/125/21/B	IEC/EN 60384-14	VDE/ 40002831
Alt. use	Walsin Technology Corp.	AH	Y1, 250V, max 470pF, 25/125/21/C	IEC/EN 60384-14	VDE/ 40001804
Alt. use	JYA-NAY Co., Ltd.	JN	Y1, 250V, max 470pF, 25/125/21/C	IEC/EN 60384-14	VDE/ 40001831

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

20.1	Table: Component				P
Object / part No.	Manufacturer/ trademark[2)]	Type / model[2)]	Technical data	Standard	Mark(s) of conformity[1)]
Alt. use	Haohua Electronic Co.	CT 7	Y1, 250V, max 470pF, 30/125/56/C	IEC/EN 60384-14	VDE/ 40003902
Alt. use	Jyh Chung Electronic Co., Ltd.	JD	Y1, 400V, max 470pF, 25/085/21	IEC/EN 60384-14	VDE/ 137027
Alt. use	Jerro Electronics Corp.	JX-series	Y1, 250V, max 470pF, 20/125/21	IEC/EN 60384-14	VDE/ 40032158
Varistor (MOV1) (optional for GT*41134-***-***)	Joyin Co., Ltd.	7N471K / 10N471K / 14N471K	Max continuous voltage: 300VAC, max peak current: 1200A / 2500A / 4500A, 40/85/56	IEC 61051-1; IEC 61051-2; IEC 61051-2-2	VDE/ 005937
Alt. use	Centra Science Corp.	CNR-07D471K / CNR-10D471K / CNR-14D471K	Max continuous voltage: 300VAC, max peak current: 1200A / 2500A / 4500A, 40/085/56	IEC 61051-1; IEC 61051-2; IEC 61051-2-2	VDE/ 40008220
Alt. use	Thinking Electronic Industrial Co., Ltd.	TVR07471 / TVR10471 / TVR14471	Max continuous voltage: 300VAC, max peak current: 1200A / 2500A / 4500A, 40/85/56	IEC 61051-1; IEC 61051-2; IEC 61051-2-2	VDE/ 005944
Alt. use	Success Electronics Co., Ltd.	SVR07D471K / SVR10D471K / SVR14D471K	Max continuous voltage: 300VAC, max peak current: 1200A / 2500A / 4500A, 40/085/56	IEC 61051-1; IEC 61051-2; IEC 61051-2-2	VDE/ 123677
Alt. use	Ceramate Techn. Co., Ltd.	GNR07D471K / GNR10D471K / GND14D471K	Max continuous voltage: 300VAC, max peak current: 1200A / 2500A / 4500A, 40/085/56	IEC 61051-1; IEC 61051-2; IEC 61051-2-2	VDE/ 40021606
Alt. use	Brightking (Shenzhen) Co., Ltd.	07D471K / 10D471K / 14D471K	Max continuous voltage: 300VAC, max peak current: 500A / 1000A / 2000A, 40/85/56	IEC 61051-1; IEC 61051-2; IEC 61051-2-2	VDE/ 40027827
Alt. use	Lien Shun Electronics Co., Ltd.	07D471K / 10D471K / 14D471K	Max continuous voltage: 300VAC, max peak current: 500A / 1000A / 2000A, 40/85/56	IEC 61051-1; IEC 61051-2; IEC 61051-2-2	VDE/ 40005858

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

20.1	Table: Component				P
Object / part No.	Manufacturer/ trademark[2)]	Type / model[2)]	Technical data	Standard	Mark(s) of conformity[1)]
Alt. use	Hongzhi Enterprises Ltd.	HEL-07D471K HEL-10D471K HEL-14D471K	Max continuous voltage: 300VAC, max peak current: 500A / 1000A / 2000A, 40/85/56	IEC 61051-1; IEC 61051-2; IEC 61051-2-2	VDE/ 40008621
Alt. use	Guangxi New Future Information Industry Co., Ltd.	07D471K 10D471K, 14D471K	Max continuous voltage: 300VAC, max peak current: 500A / 1750A / 2000A, 40/85/56	IEC 61051-1; IEC 61051-2; IEC 61051-2-2	VDE/ 40030322
Varistor (MOV1) (optional for GT-41134-0606-W2-TAB)	Panasonic Corporation	V20241U	Max continuous voltage: 150VAC, max peak current: 3000A, 40/85/56	IEC 61051-1; IEC 61051-2	VDE/ 40018677
Alt. use	Brightking Inc.	241KD20	Max continuous voltage: 150VAC, max peak current: 3000A, 40/85/56	IEC 61051-1; IEC 61051-2	VDE/ 40022070
Alt. use	EPCOS OHG	S20K150	Max continuous voltage: 150VAC, max peak current: 3000A, 40/85/56	IEC 61051-1; IEC 61051-2	VDE/ 40027582
Alt. use	Thinking Electronic Industrial Co., Ltd.	TVR20241	Max continuous voltage: 150VAC, max peak current: 3000A, 40/85/56	IEC 61051-1; IEC 61051-2	VDE/ 40031391
Alt. use	Success Electronics Co., Ltd.	SVR20D241K	Max continuous voltage: 150VAC, max peak current: 3000A, 40/85/56	IEC 61051-1; IEC 61051-2	VDE/ 40030401
Appliance inlet for class I construction model	Zhejiang LECI Electronics Co., Ltd	DB-6	AC 250 V, 2.5 A Kind of construction: standard sheet C6	IEC/EN 60320-1	VDE/ 40032465
Alt. use	Rich Bay Co., Ltd.	R-30790 / R-307	AC 250 V, 2.5 A Kind of construction: standard sheet C6	IEC/EN 60320-1	VDE/ 40030381
Alt. use	Sun Fair Electric Wire & Cable (HK) Co. Ltd.	S-02	AC 250 V, 2.5 A Kind of construction: standard sheet C6	IEC/EN 60320-1	VDE/ 40034448
Alt. use	TECX-UNIONS Technology Corporation	TU-333	AC 250 V, 2.5 A Kind of construction: standard sheet C6	IEC/EN 60320-1	VDE/ 40005430
Alt. use	Rong Feng Industrial Co., Ltd.	RF-190	AC 250 V, 2.5 A Kind of construction: standard sheet C6	IEC/EN 60320-1	VDE/ 40030379

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

20.1	Table: Component				P
Object / part No.	Manufacturer/ trademark[2)]	Type / model[2)]	Technical data	Standard	Mark(s) of conformity[1)]
Alt. use	Inalways Corporation	0724	AC 250 V, 2.5 A Kind of construction: standard sheet C6	IEC/EN 60320-1	ENEC 2010080
Alt. use	Kunshan DLK Electronics Technology Co., Ltd	CDJ-2	AC 250 V, 2.5 A Kind of construction: standard sheet C6	IEC/EN 60320-1	VDE/ 40022871
Alt. use	Zhejiang LECI Electronics Co., Ltd.	DB-14	AC 250 V, 10 A Kind of construction: standard sheet C14	IEC/EN 60320-1	VDE/ 40032137
Alt. use	Rich Bay Co., Ltd.	R-301SN	AC 250 V, 10 A Kind of construction: standard sheet C14	IEC/EN 60320-1	VDE/ 40030228
Alt. use	Sun Fair Electric Wire & Cable (HK) Co. Ltd.	S-03	AC 250 V, 10 A Kind of construction: standard sheet C14	IEC/EN 60320-1	VDE/ 40034447
Alt. use	TECX-UNIONS Technology Corporation	TU-301-S / TU-301-SP	AC 250 V, 10 A Kind of construction: standard sheet C14	IEC/EN 60320-1	VDE/ 40025582
Alt. use	Rong Feng Industrial Co., Ltd.	SS-120	AC 250 V, 10 A Kind of construction: standard sheet C14	IEC/EN 60320-1	VDE/ 40028101
Alt. use	Inalways Corporation	0711 series	AC 250 V, 10 A Kind of construction: standard sheet C14	IEC/EN 60320-1	ENEC 2010084
Appliance inlet for class II construction model	Zhejiang LECI Electronics Co., Ltd.	DB-8	AC 250 V, 2.5 A Kind of construction: standard sheet C8	IEC/EN 60320-1	VDE/ 40032028
Alt. use	Rich Bay Co., Ltd.	R-201SN90	AC 250 V, 2.5 A Kind of construction: standard sheet C8	IEC/EN 60320-1	VDE/ 40030384
Alt. use	Sun Fair Electric Wire & Cable (HK) Co. Ltd.	S-01	AC 250 V, 2.5 A Kind of construction: standard sheet C8	IEC/EN 60320-1	VDE/ 40034449
Alt. use	TECX-UNIONS Technology Corporation	SO-222 series	AC 250 V, 2.5 A Kind of construction: standard sheet C8	IEC/EN 60320-1	VDE/ 40020337
Alt. use	Rong Feng Industrial Co., Ltd.	RF-180	AC 250 V, 2.5 A Kind of construction: standard sheet C8	IEC/EN 60320-1	VDE/ 40030168
Alt. use	Inalways Corporation	0721 series	AC 250 V, 2.5 A Kind of construction: standard sheet C8	IEC/EN 60320-1	ENEC 2010087
Alt. use	Kunshan DLK Electronics Technology Co., Ltd	CDJ-8	AC 250 V, 2.5 A Kind of construction: standard sheet C8	IEC/EN 60320-1	VDE/ 40025531
Heat shrinkable tubing	SHENZHEN WOER HEAT-SHRINKABLE MATERIAL CO LTD	RSFR RSFR-H RSFR-HPF (UL E203950)	600V, 125°C	IEC 61558-2-16	Tested with appliance

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

20.1	Table: Component				P
Object / part No.	Manufacturer/ trademark[2)]	Type / model[2)]	Technical data	Standard	Mark(s) of conformity[1)]
Alt. use	QIFURUI ELECTRONICS CO	QFR-h (UL E225897)	600V, 125°C	IEC 61558-2-16	Tested with appliance
Alt. use	DONGGUAN SALIPT CO LTD	SALIPT S-901-300 SALIPT S-901-600 (UL E209436)	600V, 125°C	IEC 61558-2-16	Tested with appliance
Alt. use	GUANGZHOU KAIHENG ENTERPRISE GROUP	K-2 (+) K-2 (CB) (UL E214175)	600V, 125°C	IEC 61558-2-16	Tested with appliance
Alt. use	CHANGYUAN ELECTRONICS (SHENZHEN) CO LTD	CB-HFT (UL E180908)	600V, 125°C	IEC 61558-2-16	Tested with appliance
Transformer (T1) (only for GT*41134-***-***)	GlobTek/ BOAM/ HAOPUWEI	XF00714I / XF00717 / XF00718 / XF00719 / XF00814 / XF00841	XF00714I(5-8.9V) XF00717(9-14.9V) XF00718(15-18.9V) XF00719(19-24V) XF00814(24.1-36V) XF00841(36.1-48V); Class 130 (B) electrical insulation systems, designated BOAM-01 (UL E252329) / Class 130 (B) electrical insulation systems, designated GTX-130-TM (UL E243347) / Class 130 (B) electrical insulation systems, designated ZT-130 (UL E315275) / Class 130 (B) electrical insulation systems, designated ENG130-1 (UL E308897).	IEC 61558-2-16	Tested with appliance

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

20.1	Table: Component				P
Object / part No.	Manufacturer/ trademark[2)]	Type / model[2)]	Technical data	Standard	Mark(s) of conformity[1)]
Transformer (T1) (only for GT-41134-0606-W2-TAB)	GlobTek/ BOAM/ HAOPUWEI	XF00714I	Class 130 (B) electrical insulation systems, designated BOAM-01 (UL E252329) / Class 130 (B) electrical insulation systems, designated GTX-130-TM (UL E243347) / Class 130 (B) electrical insulation systems, designated ZT-130 (UL E315275) / Class 130 (B) electrical insulation systems, designated ENG130-1 (UL E308897).	IEC 61558-2-16	Tested with appliance
Triple insulated wire	Great Leoflon Industrial Co., Ltd.	TRW (B) Serie(s)	Class B, reinforced insulation	IEC 60950-1	VDE/ 136581
Alt. use	COSMOLINK CO. Ltd.	TIW-M Serie(s)	Class B, reinforced insulation	IEC 60950-1	VDE/ 138053
Alt. use	Furukawa Electric Co., Ltd. Electronics & Automotive Systems Company Global Business Development Division	TEX-E	Class B, reinforced insulation	IEC 60950-1	VDE/ 006735
Alt. use	Totoku Electric Co. Ltd.	TIW-2	Class B, reinforced insulation	IEC 60950-1	VDE/ 40005152
Alt. use	E&B Technology Co., Ltd.	E&B-XXXB	Class B, reinforced insulation	IEC 60950-1	VDE/ 40023473
Magnet wire	PACIFIC ELECTRIC WIRE & CABLE (SHENZHEN) CO LTD	UEWN/U (UL E201757)	MW28-C, 130°C	IEC 61558-2-16	Tested with appliance
Alt. use	PACIFIC ELECTRIC WIRE & CABLE (SHENZHEN) CO LTD	UEWS/U (UL E201757)	MW75-C, 130°C	IEC 61558-2-16	Tested with appliance
Alt. use	CHENG DU SOUTH-WEST ELECTRIC CO.,LTD	2UEW (UL E178366)	MW75#, 130°C	IEC 61558-2-16	Tested with appliance
Alt. use	JUNG SHING WIRE CO LTD	UEW-4 (UL E174837)	MW75C, 130°C	IEC 61558-2-16	Tested with appliance

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

20.1	Table: Component				P
Object / part No.	Manufacturer/ trademark[2)]	Type / model[2)]	Technical data	Standard	Mark(s) of conformity[1)]
Alt. use	JUNG SHING WIRE CO LTD	UEY-2 (UL E174837)	MW28-C, 130°C	IEC 61558-2-16	Tested with appliance
Alt. use	JIANGSU HONGLIU MAGNET WIRE TECHNOLOGY CO LTD	2UEW/130 (UL E335065)	MW75-C, 130°C	IEC 61558-2-16	Tested with appliance
Alt. use	CHANGZHOU DAYANG WIRE & CABLE CO LTD	2UEW/130 (UL E158909)	MW75-C, 130°C	IEC 61558-2-16	Tested with appliance
Alt. use	WUXI JUFENG COMPOUND LINE CO LTD	2UEWB (UL E206882)	MW75#, 130°C	IEC 61558-2-16	Tested with appliance
Alt. use	JIANGSU DARTONG M & E CO LTD	UEW (UL E237377)	MW 75-C, 130°C	IEC 61558-2-16	Tested with appliance
Alt. use	SHANDONG SAINT ELECTRIC CO LTD	UEW/130 (UL E194410)	MW75#, 130°C	IEC 61558-2-16	Tested with appliance
Alt. use	ZHEJIANG LANGLI ELECTRIC EQUIPMENTS CO LTD	UEW (UL E222214)	MW 79#, 130°C	IEC 61558-2-16	Tested with appliance
Bobbin	CHANG CHUN PLASTICS CO LTD	T375J T375HF (UL E59481)	V-0, 150°C, min thickness: 0,45mm	IEC 61558-2-16	Tested with appliance
Alt. use	SUMITOMO BAKELITE CO LTD	PM-9820 (UL E41429)	V-0, 150°C, min thickness: 0,45mm	IEC 61558-2-16	Tested with appliance
Alt. use	HITACHI CHEMICAL CO LTD	CP-J-8800 (UL E42956)	V-0, 150°C, min thickness: 0,45mm	IEC 61558-2-16	Tested with appliance
Insulating tape	3M COMPANY ELECTRICAL MARKETS DIV (EMD)	1350F-1 / 1350T-1 (UL E17385)	130°C	IEC 61558-2-16	Tested with appliance
Alt. use	BONDTEC PACIFIC CO LTD	370S (UL E175868)	130°C	IEC 61558-2-16	Tested with appliance
Alt. use	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD	PZ, CT, WF (UL E165111)	130°C	IEC 61558-2-16	Tested with appliance
Alt. use	JINGJIANG JINGYI ADHESIVE PRODUCT CO LTD	JY25-A (UL E246950)	130°C	IEC 61558-2-16	Tested with appliance
Alt. use	CHANG SHU LIANG YI TAPE INDUSTRY CO LTD	LY-XX (UL E24680)	130°C	IEC 61558-2-16	Tested with appliance
PTFE tubing	GREAT HOLDING INDUSTRIAL CO LTD	TFS (UL E156256)	600V, 200°C	IEC 61558-2-16	Tested with appliance

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

20.1	Table: Component				P
Object / part No.	Manufacturer/ trademark[2)]	Type / model[2)]	Technical data	Standard	Mark(s) of conformity[1)]
Alt. use	SHENZHEN WOER HEAT-SHRINKABLE MATERIAL CO LTD	WF (UL E203950)	600V, 200°C	IEC 61558-2-16	Tested with appliance
Alt. use	CHANGYUAN ELECTRONICS (SHENZHEN) CO LTD	CB-TT-S (UL E180908)	600V, 200°C	IEC 61558-2-16	Tested with appliance
1) An asterisk indicates a mark which assures the agreed level of surveillance.					

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

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)**
Input and Output	356	240	4.5	6.2	4.8	6.2
Different Polarity of fuse	339	240	2.4	3.0	2.44	3.0
L and N before fuse	339	240	2.4	3.4	2.44	3.4
Input to earthing (for open frame models with class I construction)	339	240	2.4	3.6	2.44	3.6
Input to body (for direct plug in models)	339	240	4.5	5.8	4.8	5.8
Supplementary information:						

26	TABLE: DISTANCE THROUGH INSULATION MEASUREMENTS				P
Distance through insulation di at/of:	**U r.m.s. (V)**	**Test voltage (V)**	**Required di (mm)**	**di (mm)**	
Input to Output through transformer	240	5000	Triple insulation winding add basic insulation	Triple insulation winding add 2 layers insulation tape	
Input to Body (for direct plug in models)	240	3640	0.8	2.0	
Supplementary information:					

26.2 TEST A	TABLE: CREEPAGE DISTANCES AND CLEARANCES AND DISTANCES THROUGH INSULATION	N/A

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

	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		

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		

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		

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		

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**	
			te	**ti**	**te**	**ti**	

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

Enclosure and blade holder (SE1X)	SABIC	-	-	-	NA	NI	-	Pass
Enclosure and blade holder (SE1)	SABIC	-	-	-	NA	NI	-	Pass
Enclosure and blade holder (SE100)	SABIC	-	-	-	NA	NI	-	Pass
Enclosure and blade holder (C2950)	SABIC	-	-	-	NA	NI	-	Pass
Enclosure and blade holder (CX7211)	SABIC	-	-	-	NA	NI	-	Pass
Enclosure and blade holder (EXCY0098)	SABIC	-	-	-	NA	NI	-	Pass
Enclosure and blade holder (LN-1250P)	Tejin	-	-	-	NA	NI	-	Pass
Enclosure and blade holder (LN-1250G)	Tejin	-	-	-	NA	NI	-	Pass
Enclosure and blade holder (PA-765A)	CHI MEI	-	-	-	NA	NI	-	Pass
Enclosure and blade holder (PA-540)	CHI MEI	-	-	-	NA	NI	-	Pass
Bobbin (T375J)	Chang Chun	-	NA	NI	-	-	-	Pass
Bobbin (T375HF)	Chang Chun	-	NA	NI	-	-	-	Pass
Bobbin (PM-9820)	Sumitomo	-	NA	NI	-	-	-	Pass
Bobbin (CP-J-8800)	HITACHI	-	NA	NI	-	-	-	Pass
Connector	GlobTek	-	-	-	-	-	NI	Pass
Appliance inlet (DB-6)	LECI	-	-	-	-	-	NI	Pass

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

Appliance inlet (R-30790)	Rich Bay	-	-	-	-	-	NI	Pass
Appliance inlet (R-307)	Rich Bay	-	-	-	-	-	NI	Pass
Appliance inlet (S-02)	Sun Fair	-	-	-	-	-	NI	Pass
Appliance inlet (TU-333)	TECX-UNIONS	-	-	-	-	-	NI	Pass
Appliance inlet (RF-190)	Rong Feng	-	-	-	-	-	NI	Pass
Appliance inlet (0724)	Inalways	-	-	-	-	-	NI	Pass
Appliance inlet (CDJ-2)	DLK	-	-	-	-	-	NI	Pass
Appliance inlet (DB-14)	LECI	-	-	-	-	-	NI	Pass
Appliance inlet (R-301SN)	Rich Bay	-	-	-	-	-	NI	Pass
Appliance inlet (S-03)	Sun Fair	-	-	-	-	-	NI	Pass
Appliance inlet (TU-301-S)	TECX-UNIONS	-	-	-	-	-	NI	Pass
Appliance inlet (TU-301-SP)	TECX-UNIONS	-	-	-	-	-	NI	Pass
Appliance inlet (SS-120)	Rong Feng	-	-	-	-	-	NI	Pass
Appliance inlet (0711)	Inalways	-	-	-	-	-	NI	Pass
Appliance inlet (DB-8)	LECI	-	-	-	-	-	NI	Pass
Appliance inlet (R-201SN90)	Rich Bay	-	-	-	-	-	NI	Pass
Appliance inlet (S-01)	Sun Fair	-	-	-	-	-	NI	Pass
Appliance inlet (SO-222)	TECX-UNIONS	-	-	-	-	-	NI	Pass
Appliance inlet (RF-180)	Rong Feng	-	-	-	-	-	NI	Pass
Appliance inlet (0721)	Inalways	-	-	-	-	-	NI	Pass
Appliance inlet (CDJ-8)	DLK	-	-	-	-	-	NI	Pass

Object/ Part No./ Material	**Manufacturer / trademark**	**Glow-wire flammability index (GWFI), °C**				**GW ignition temp. (GWIT), °C**		**Verdict**
		550	**650**	**750**	**850**	**675**	**775**	
--	--	--	--	--	--	--	--	--
:								
If no, then surrounding parts passed the needle-flame test of annex E (Yes/No) :								
The test specimen passed the test by virtue of most of the flaming material being withdrawn with the glow-wire (Yes/No)? :								

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

Ignition of the specified layer placed underneath the test specimen (Yes/No) :	
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. NI: No Ignition NA: Not Applicable	

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)														

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

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														

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

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 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														

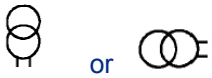
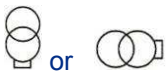
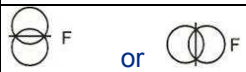
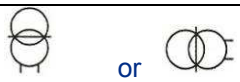
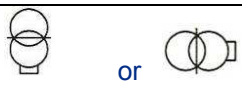
IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict

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							

IEC 61558-2-16			
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	III	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

IEC 61558-2-16			
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**		N/A
	Additional Symbols (IEC 61558-2-16:09)		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
	SMPS incorporating a **Short-circuit-proof isolating transformer** (inherently or non-inherently)		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

BB.10	**CHANGE OF INPUT VOLTAGE SETTING**	N/A

BB.11	**OUTPUT VOLTAGE AND OUTPUT CURRENT UNDER LOAD**	N/A

BB.12	**NO-LOAD OUTPUT VOLTAGE (see supplementary requirements in Part 2)**	N/A

BB.13	**SHORT-CIRCUIT VOLTAGE**	N/A

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

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 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; Upri(V):1,2 times rated supply voltage; frequency (Hz): 2 times rated frequency		N/A

BB.15	**SHORT-CIRCUIT AND OVERLOAD PROTECTION**	N/A

BB.16	**MECHANICAL STRENGTH**	N/A

BB.17	**PROTECTION AGAINST HARMFUL INGRESS OF WATER AND MOISTURE**	N/A

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 2 M		N/A
	– live parts and body for reinforced insulation 7 M		N/A
	– input circuits and output circuits for basic insulation 2 M		N/A
	– input circuits and output circuits for double or reinforced insulation 5 M		N/A
	– each input circuit and all other input circuits connected together 2 M		N/A
	– each output circuit and all other output circuits connected together 2 M		N/A
	– hazardous live parts and metal parts with basic insulation (Class II transformers) 2 M		N/A
	– body and metal parts with basic insulation (Class II transformers) 5 M		N/A
	– metal foil in contact with inner and outer surfaces of enclosures 2 M		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
	4) Reinforced insulation between the body and live parts; working voltage (V); test voltage (V) ..... :		N/A

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

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
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
			N/A
	Class II SMPS (IEC 61558-2-16:09)		N/A
	– 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):		N/A

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
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, **no**t 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
	– 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

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

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
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
	• Multi-layer extruded or spirally wrapped insulation, passed the tests of annex K		N/A
	• Basic insulation: two wrapped or one extruded wire		N/A
	• Supplementary insulation: two layers, wrapped or extruded		N/A
	• Reinforced insulation: three layers wrapped or extruded		N/A
	Spirally wrapped insulation:		N/A
	• creepage distances between wrapped layers > cl. 26 _ P1 values		N/A
	• path between wrapped layers sealed, the test voltage of K2 is multiplied with 1,35		N/A
	• test 26.2.3 – Test A, passed for wrapped layers		N/A
	• 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
	• comply with annex K		N/A
	• two layers for supplementary insulation		N/A
	• one layer for basic insulation		N/A
	• 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
	• comply with annex K		N/A
	• three layers		N/A
	• relevant dielectric strength test of 18.3		N/A

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

	Where the insulated winding wire is wound:		N/A
	• upon metal or ferrite cores		N/A
	• upon enamelled wire		N/A
	• under enamelled wire		N/A
	• 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
	• 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	Transformers which use FIW wire		N/A
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
	• 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:		N/A
	• 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
	• 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
	• between FIW and enamelled wire, no requirements of creepage distances and clearances		N/A
	• no touch of FIW and enamelled wires (grad 1, or grad 2 …)		N/A

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	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
	• 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
	• for primary and secondary winding FIW-wire for basic insulation is used		N/A
	• 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
	• no touch between the basic insulated PRI and SEC FIW-wires		N/A
	• 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
	• 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
	• 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
	• no touch between the FIW wire and the enamelled wire		N/A
	• 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)		N/A
	• 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

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	• PRI or SEC basic insulated FIW wire and to the other winding (enamelled wire) requirements of supplementary insulation		N/A
	• 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
	• upon metal or ferrite cores		N/A
	• 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
	• 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

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	– 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 uninsulated 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 s waveform) – see Annex R of IEC 61558-1		N/A
BB.26.2.4	Enclosed parts, by impregnation or potting		N/A
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

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

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
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
	– 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 ≥0,2 mm		N/A
	– Minimum thickness of supplementary insulation ≥0,1 mm		N/A
BB.26.3.2	Insulation in thin sheet form		N/A
	– If the layers are non-separable (glued together):		N/A
	– 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:		N/A
	– 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

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	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 25 VA 100 VA 2/3 of the value in square brackets apply		N/A
	– rated output __ 25 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
	– 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

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	– rated internal frequency		N/A
	1. Insulation between input and output circuits (basic insulation):		N/A
	a) measured values specified values (mm) ..... :		N/A
	2. Insulation between input and output circuits (double or reinforced insulation):		N/A
	a) measured values specified values (mm) ..... :		N/A
	b) measured values specified values (mm) ..... :		N/A
	c) measured values specified values (mm) ..... :		N/A
	3. Insulation between adjacent input circuits: measured values specified values (mm) ..... :		N/A
	Insulation between adjacent output circuits: measured values specified values (mm) ..... :		N/A
	4. Insulation between terminals for external connection:		N/A
	a) measured values specified values (mm) ..... :		N/A
	b) measured values specified values (mm) ..... :		N/A
	c) measured values specified values (mm) ..... :		N/A
	5. Basic or supplementary insulation:		N/A
	a) measured values specified values (mm) ..... :		N/A
	b) measured values specified values (mm) ..... :		N/A
	c) measured values specified values (mm) ..... :		N/A
	d) measured values specified values (mm) ..... :		N/A
	e) measured values specified values (mm) ..... :		N/A
	6. Reinforced or double insulation: measured values specified values (mm) ..... :		N/A
	7. Distance through insulation:		N/A

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	a) measured values specified values (mm) ..... :		N/A
	b) measured values specified values (mm) ..... :		N/A
	c) measured values 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 ≥ 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
	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

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
BB.26.104	The working voltages of Table 102, 103 and 104 are peak voltages including µsec 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
	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 $\leq$ 2 kV/mm		N/A
	For thin layers d2 $\leq$ 30 µm the peak value of the field strength is $\leq$ 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
	• 10 cycles are required		N/A

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	• 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
	• 1 h at 25° C		N/A
	• 2 h at 0° C		N/A
	• 1 h at 25° C – (next cycle start again with 68 h max winding temp + 10)		N/A
	• during the 10 cycles test 2 x working voltage is connected between PRI and SEC		N/A
	• 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
	• 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
	• 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

BB.27	**RESISTANCE TO HEAT, FIRE AND TRACKING**		N/A
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 60695-2-11apply, 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

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
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
	• insulated winding wire for basic or supplementary insulation (see 19.12.3)		N/A
	• insulated winding wire for reinforced insulation (see 19.12.3)		N/A
	• splid circular winding wires and stranded winding wires with 0,05 to 5 mm diameter		N/A
	• 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
	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

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	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/mm² (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
	• high voltage test immediately after this test		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.2.5	Retention of dielectric strength after bending (test as specified under test 13 of 4.6.1 c) of IEC 60 851-5)		N/A
	• high voltage test immediately after this test		N/A
	• Dielectric strength test: 5,5 kV for reinforced insulation		
	• Dielectric strength test: 2,75 kV for basic or supplementary insulation		
BB.K.3	Testing during manufacturing		N/A
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
	• Dielectric strength test: 4,2 kV for reinforced insulation		N/A
	• 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
	• Dielectric strength test: 6 kV for reinforced insulation		N/A
	• 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

IEC 61558-2-16			
Clause	Requirement + Test	Result - Remark	Verdict
	• Dielectric strength test: 5,5 kV for reinforced insulation		N/A
	• 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	

IEC 61558-2-16 Annex BB			
Clause	Requirement + Test	Result - Remark	Verdict
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	
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	
BB.26.107 61558-2-16/A1	**TABLE: CREEPAGE DISTANCES AND CLEARANCES AND DISTANCES THROUGH INSULATION**		N/A

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

	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	

	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					
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				
Distance through insulation di at/of:	**U r.m.s. (V)**	**Test voltage (V)**	**Required di (mm)**	**di (mm)**	
Supplementary information:					

Appendix no.2: Equipment combined with two-pole plug (Class II) (for models of GT*41134-***-***)

Supplementary tests on plug portion according to IEC 60884-1:2002 + A1:2006 and EN50075:1990

Clause	*Requirement + Test*	Verdict
1.	***Dimensions (Clause 7 of EN 50075)***	
	Plugs shall comply with standard size. (Standard sheet 1)	P
2.	***Protection Against Electric Shock (Clause 8 of EN 50075)***	
2.1	*Live parts of plugs with the exception of the bare metal parts of the pins, shall not be accessible. (Clause 8.1 of EN 50075)*	P
2.2	*It shall not be possible to make connection between a pin of a plug and a live socket contact of a socket-outlet while the other pin is an accessible. (Clause 8.2 of EN 50075)*	P
2.3	*External parts of plugs, with the exception of pins, shall be of insulating material. (Clause 8.3 of EN 50075)*	P
3.	***Construction (Clause 9 of EN 50075)***	
3.1	*The plug cannot be opened by hand or by using a general purpose tool. (Clause 9.1 of EN 50075)*	P
3.2	*Pins of plugs shall be solid and shall have adequate mechanical strength. (Clause 9.3 of EN 50075)*	P
3.3	*Pins of plugs shall be locked against rotation and adequately fixed into the body of the plug. (Clause 9.4 of EN 50075)*	P
3.4	*Plugs shall be provided with soldered, crimped or equally effective permanent connection. (Clause 9.5 of EN 50075)*	P
3.5	*Plug shall be shaped in such a way and made of such a material that they can easily be withdrawn by hand from a socket-outlet. (by gripping the power supply enclosure, Clause 9.6 of EN 50075)*	P
4.	***Resistance to Humidity (Clause 10 of EN 50075)***	N/A
	The integrated pins were tested together with the power supply. (See test report for power supply)	
5.	***Insulation Resistance and Electric Strength (Clause 11 of EN 50075)***	N/A
	(See test report for power supply)	
6.	***Mechanical Strength (Clause 13 of EN 50075)***	
	Plug shall have adequate mechanical strength to withstand the stresses imposed during use.	P

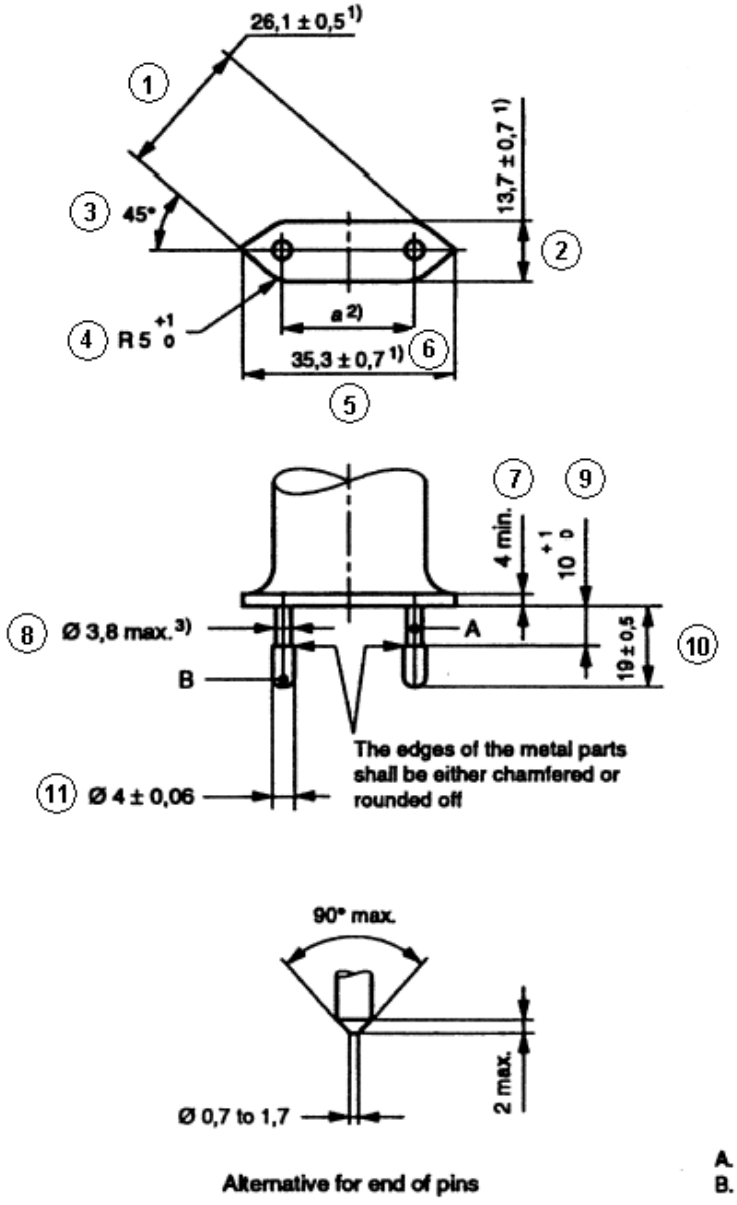
Clause	Requirement + Test	Verdict
6.1	The plugs are pressed between two flat surfaces with a force of 150N for 5min. 15min after removal of the force, the plug shall not show such deformation as would result in undue alteration of the dimensions which ensure safety. (Clause 13.1 of EN 50075)	P
6.2	The plug is tested in a tumbling barrel. (Clause 13.2 of EN 50075, fall number is shown in test report for power supply) After the test, the plug shall show no damage within the meaning of this standard, in particular: --- no part shall become detached or loosened. --- the pin shall not turn when a torque of 0.4Nm is applied. Note: A section of the pin is square constructed for preventing the rotation.	P
6.3	The pins is held in a suitable clamp in such a position that the straight part of a steel wire (D=1+-0.02mm, U-shaped) rests on the plug pin. The plug is caused to move backwards and forwards, so that the wire rubs along the pin. The number of the movements is 20 000, and the rate of the operation is 25 movements per min. (Clause 13.3 of EN 50075)	P
	After the test, the pin show no damage which may effect safety or impair the further use of the plug, in particular, the insulating sleeve shall not have punctured or rucked up.	P
6.4	A pull force of 40N is applied for 60s on each pin in turn in the direction of the longitudinal axis of the pin. The pull is applied 60min after the plug has been placed in a heating cabinet of 70°C. After the plug cooling down to ambient temperature, any pin shall not have displaced in the body of the plug more than 1mm. (Clause 13.4 of EN 50075)	P
7.	**Resistance to Heat and to Ageing (Clause 14 of EN 50075)**	P
8.	**Current-carrying Parts and Connections (Clause 15 of EN 50075)**	
8.1	Connection, electrical and mechanical, shall withstand the mechanical stresses occurring in normal use, and electrical connections shall be designed that contact pressure is not transmitted through insulating material. (Clause 15.1 & 15.2 of EN 50075)	P
8.2	Current-carrying parts shall be of copper or an alloy containing at least 58% of copper. (Clause 15.3 of EN 50075)	P
9.	**Creepage Distance, Clearances, and Distances Through Insulation (Clause 16 of EN 50075)**	P
10.	**Resistance of Insulating Material to Abnormal Heat and to fire (Clause 17 of EN 50075)**	P

Appendix no. 3: Dimension Checking for Two-pin plug according to EN50075 (for models of GT*41134-*-***)**

	DIMENSIONS Checked by means of measurement according to EN50075 Standard sheet 1 (see appendix no. 4)	P

Position	Requirement (mm)	Measured (mm)	Verdict
1	25,6 – 26,6	25,84	P
2	13 – 14,4	13,98	P
3	45°	45°	P
4	R5 – 6	R5,4	P
5	34,6 – 36	35,09	P
6	18-19,2 in the plane of the engagement face	18,15	P
	17-18 at the ends of the pins	17,55	P
7	4min	-	N/A
8	ϕ3,8max	ϕ3,42	P
9	10-11	10,05	P
10	18,5 – 19,5	19,12	P
11	ϕ3,94 - ϕ4,06	ϕ3,98	P
	Dimensions of position 1, 2 and 3 shall not be exceeded within a distance of 18mm from the engagement face of the plug	19,15	P
	The edges of the metal parts shall be either chamfered or rounded off	Rounded off	P

EN50075: 1990 Standard sheet 1



Dimensions in millimetres

1) These dimensions shall not be exceeded within a distance of 18 mm from the engagement face of the plug.

2) Dimension *a* is:

18 mm to 19,2 mm in the plane of the engagement face;

17 mm to 18 mm at the ends of the pins.

3) This dimension may be increased to 4 mm within a distance of 4 mm from the engagement face of the plug.

Pin ends shall be rounded, or conical as shown in detail sketch.

The sketches are not intended to govern design except as regards the dimensions shown.

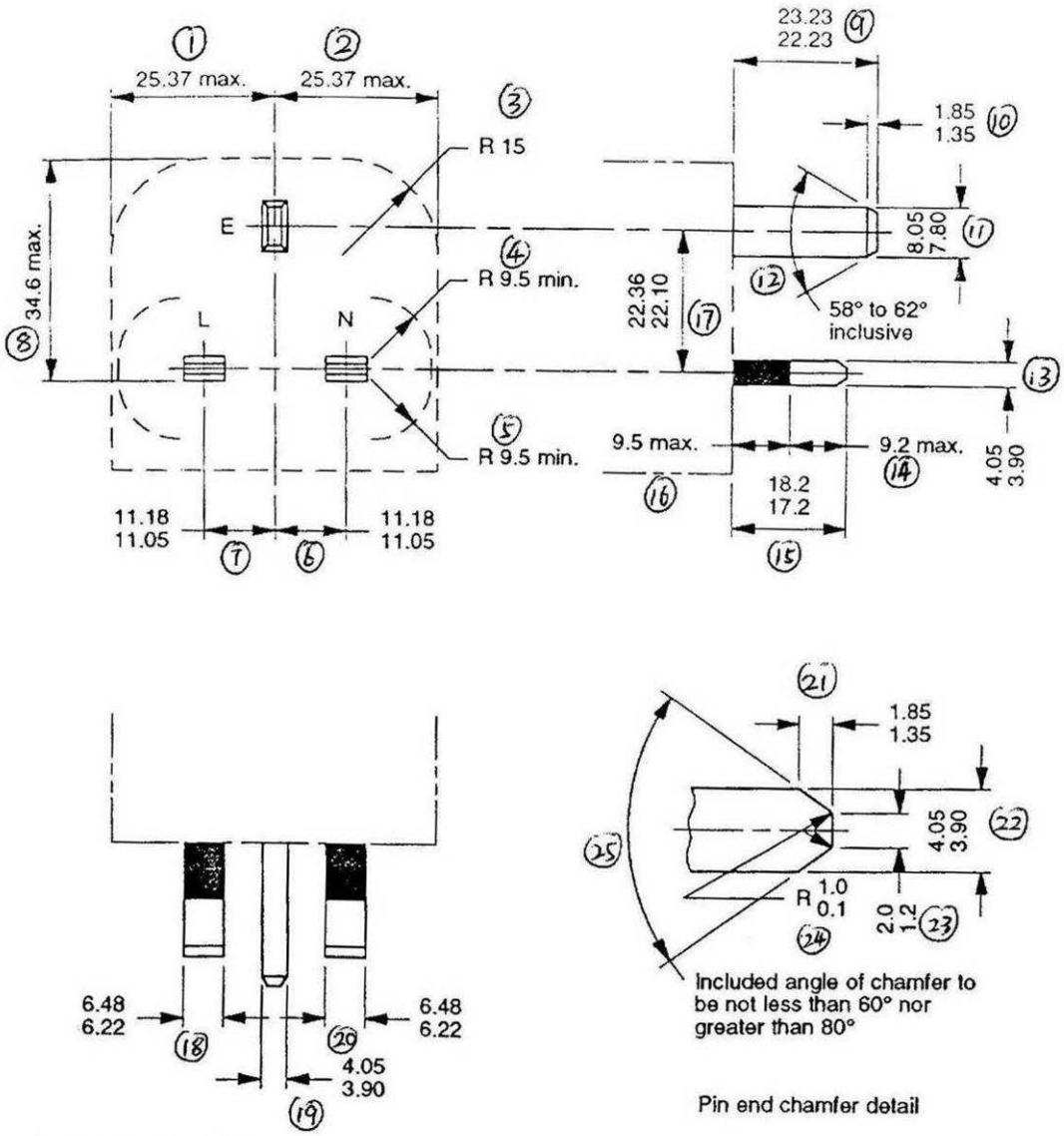
Appendix no. 4: Supplementary tests on plug portion according to BS1363: Part 3 + Amd 9543 + Amd 14225 + Amd 14540+ Amd 17437 +A4:2012 and IEC 60884-1:2002 + A1:2006 (for models of GT*41134-***-***)

Clause	Requirement - Test	Result-Remark	Verdict
12.1	Dimensions (Checked according to figure 4)	See appendix no. 5	P
12.2	Outline of plug shall not exceed the dimension shown in Figure 4 for a distance of not less than 6.35 mm from the engagement surface	8.90 mm	P
	Pin disposition, length and body outline shall be checked by use of the gauge shown in Figure 5		P
12.3	L/N pin was more than 9.5 mm from the periphery of the plug measured along the engagement surface	9.60 mm	P
12.7	The base and cover of rewireable plugs shall be adaptor plugs having the cover fixed by screws shall be firmly secured to each other, It shall not be possible to remove the cover unless the adaptor is completely withdrawn from the socket-outlet. Fixing screws shall be captive. The test is carried out using apparatus similar to that shown in Figure 6		N/A
12.9	After the temperature rise test (clause 16). Use test probe 11 of BS EN 61032:1998 is applied a force 30 -5/0 N. During and after the test, it was not possible to touch the live parts		P
12.11	Adaptor plug pins shall be constructed of brass, except for sleeves of pins as specified in 12.18		P
	All exposed surfaces of the adaptor plug pins shall be smooth and free from burrs or sharp edges and other irregularities which could cause damage or excessive wear to corresponding socket contacts or shutters		P
	Those surfaces of the non-solid adaptor plug pins which are visible when the adaptor is correctly assembled shall be free of apertures		P
	All seams and joints of non-solid adaptor plug pins shall be closed over their entire length		P
	For solid pins, conformity shall be checked by 12.11.4.1		P
	For non-solid pins, compliance shall be checked by 12.11.4.2		N/A
	Adaptors with non-solid pins shall not cause excessive wear to socket contacts or shutters of socket-outlets in accordance with BS 1363-2:1995		N/A

Clause	Requirement - Test	Result-Remark	Verdict
	Adaptor plug pins shall have adequate mechanical strength to ensure that they cannot be distorted by twisting. Apply a torque 1N.m ± 10% for 60 +5/0 S. After each pin has been separately twisted, the plug was fit the gauge in fig. 5. Repeated with opposite direction		P
12.13	Adaptors shall be so designed that when fully assembled the pins are adequately retained in position such that there is no likelihood of them becoming detached from the adaptor during normal use		P
	Each pin is subjected for 60 +5/0 S to a pull of 100 -2/0 N without jerks in the direction of the major axis. The plug is mounted using the steel plate shown in fig.7. The apparatus is placed within an oven and the pull is applied at least 1 h after the plug body has attained the test temperature of 70°C ± 5°C while maintained at this temperature. After the test, the plug pin shall fit into the gauge and comply with 12.2.1		P
12.14	The degree of flexibility of mounting of the plug pins or the angular movement of the pins in the base shall be not greater than 3° 30'. See fig. 8		P
	Test procedure refers to standard. During each test, the declination from the horizontal measured on the scale was not exceed 3° 30' and comply with 12.2.1		P
12.18	Live and neutral adaptor plug pins shall be fitted with insulating sleeves. See fig.4. Sleeves shall not fitted to any earthing adaptor plug pin		P
12.19.3	Abrasion test – 10 000 times in each direction(20 000 movements) at a rate of 25 movements to 30 movements per min. (fig. 9) After the test, the sleeve shall show no damage and also shall not have been penetrated or creased, satisfy the tests in 12.19.2		P
13.10	The total mass of the equipment with all specified connectors shall not exceed 800 g. The torque exerted on a socket shall not exceed 0.7 N • m. The test apparatus as Figure 37	Compliance with the main standard	N/A
	Additional: Products with torque exceeding 0.25Nm do not comply with the main standard hence full compliance with the main standard cannot be claimed		N/A

Clause	Requirement - Test	Result-Remark	Verdict
Additional test for ISODs according to BS1363: Part 1 + Amd 9541 + Amd 14539 + Amd17435 + A4:2012			
12.9.1	All exposed surfaces of plug pins shall be smooth and free from burrs or sharp edges and other irregularities which could cause damage or excessive wear to corresponding socket contacts or shutters		P
12.9.4	Apply a force of 1100 -10/0N at a rate not exceeding 10 mm/min. After this test the plug should fit the gauge to fig. 5		P
	Apply a force of 400 +10/0N at a rate 10 ± 2 mm/min. Deflection shall not exceed 1.5 mm. After this test the plug should fit the gauge to fig. 5		P
12.9.6	ISODs shall have adequate mechanical strength to ensure that they cannot be distorted by twisting. Apply a torque 1N.m ± 10% for 60 +5/0 S. After each pin has been separately twisted, the plug shall fit the gauge in fig. 5. Repeated with opposite direction		P

Appendix no. 5：Dimension Checking for plug According to BS1363



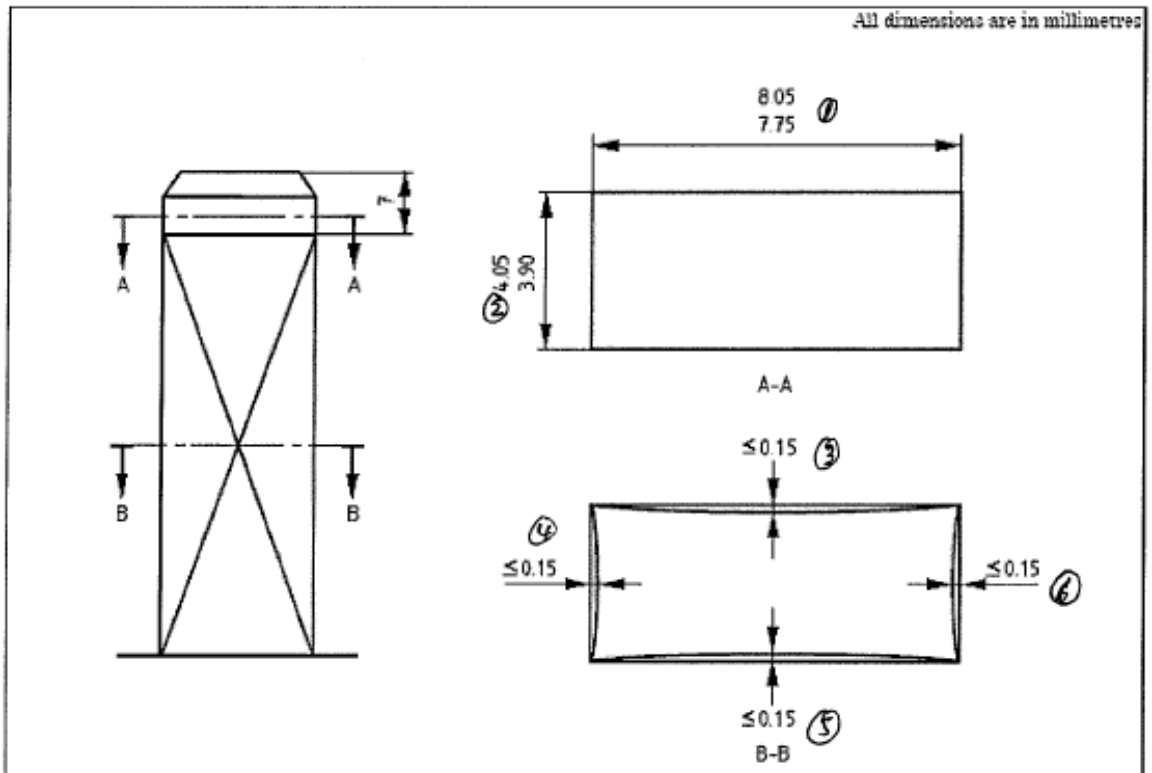
All dimensions are in millimetres.

Figure 4. Dimensions and disposition of pins (see clause 12)

	Dimensions Checked by means of measurement according to BS1363-3 Fig. 4 (see appendix no. 5)		
Position	Requirement (mm)	Measured (mm)	Verdict
1.	25,37max	24.02	P
2.	25,37max	24.02	P
3.	R15min	Measured by guage	P
4.	R9,5min	9.60	P
5.	R9,5min	9.60	P
6.	11,05-11,18	11.12	P
7.	11,05-11,18	11.12	P
8.	34,6max	30.50	P
9.	22,23-23,23	22.60	P
10.	1,35-1,85	1.55	P
11.	7,80-8,05	8.03	P
12.	58^{o}-62^{o} inclusive	60^{o}	P
13.	3,90-4,05	3.99	P
14.	9,2max	8.88	P
15.	17,2-18,2	18.05	P
16.	9,5max	9.17	P
17.	22,10-22,36	22.21	P
18.	6,22-6,48	6.26	P
19.	3,90-4,05	4.03	P
20.	6,22-6,48	6.26	P
21.	1,35-1,85	1.81	P
22.	3,90-4,05	3.98	P
23.	1,2-2,0	1.24	P
24.	R0,1-R1,0	R0.55	P
25.	60^{o}-80^{o} inclusive	68^{o}	P
Outline of the plug not exceed the dimension shown in figure 4 at least 6,35mm from the engagement surface		8.90	P

Concave shrinkable allowance for ISODs

	Dimensions Checked by means of measurement according to BS1363-1 Fig. 4b		
Position	Requirement (mm)	Measured (mm)	Verdict
1.	7,75-8,05	8.03	P
2.	3,90-4,05	3.99	P
3.	≤ 0,15	0.01	P
4.	≤ 0,15	0.01	P
5.	≤ 0,15	0.01	P
6.	≤ 0,15	0.01	P

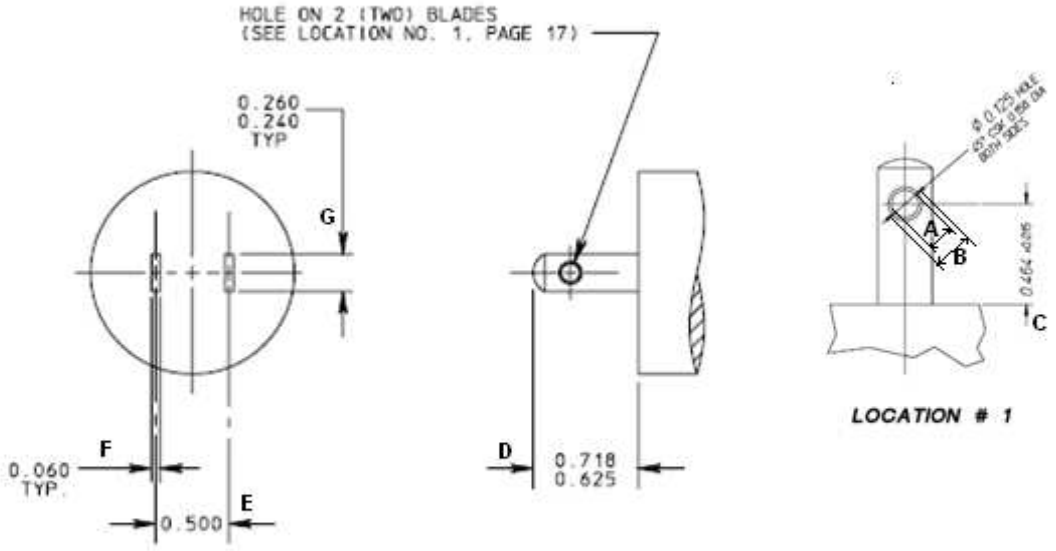


Solid insulated shutter opening device (ISOD)

NOTE Section A-A to be measured away from chamfer as shown.

Figure 4b) — Concave shrinkage allowance for ISODs

Appendix 6: Dimension Checking for United States plug According to ANSI/NEMA WD6-2002 Figure 1 -15P (for models of GT*41134-***-*** / GT-41134-0606-W2-TAB)



NON-POLARIZED PLUG

Symbol	Requirement inch (mm)	Measured (mm)		Symbol	Requirement inch(mm)	Measured (mm)
A	0.125+/-0,005" (3.18)	3.17 / 3.16		E	0.505 (12.83) ≥ E ≥ 0.495 (12.57)	12.76 / 12.71
B	0.156+/-0,005" (3.96)	3.88 / 3.91		F	0.065 (1.65) ≥ F ≥ 0.055 (1.40)	1.48 / 1.47
C	0.479 (12.17) ≥ C ≥ 0.449 (11.40)	11.52 / 12.15		G	0.260 (6.60) ≥ G ≥ 0.240 (6.10)	6.28 / 6.43
D	0.718(18.24) ≥ D ≥ 0.625 (15.88)	17.10 / 17.41				
The perimeter of the face section from which the blades project shall not be less than 0.20 inch (5.1 mm) from any point on either blade. For products that are intended for use with children's toys, this distance shall be increased to7.9 mm. (UL1310). the perimeter of the face section from which the blades project shall not be less than 8.0mm from any point on either blade.(for CSA-C22.2 No.223)						12.39 / 11.56

Appendix No. 7： Equipment's combined with Australian plug.

The Australian plug was tested according to Annex J of AS/NZS 3112:2011+A1:2012+A2:2013 and IEC 60884-1:2002 + A1:2006 (for models of GT*41134-*-***):**

Clause	Requirement – Test	Remark	Verdict
2.2	**PLUG PINS**		P
2.2.1	Material for pins		P
	Current carrying parts of plug pins -copper, or copper alloy containing at least 58% copper for parts made from cold rolled sheet or at least 50% copper for other parts; or stainless steel containing at least 13% chromium and not more than 0.09% carbon.	65% copper	P
2.2.2	Assembly of pins		P
2.2.3	The exposed ends and the contact portion of plug pins shall be smooth and free from openings or indentations;		P
2.2.4*	Live parts of insulated pin plugs shall not be exposed when the plug is partially or fully engaged with the associated socket.		P
	Plugs with insulated pin do not need to comply with the R20.0 +/-1 mm of Figure 2.1(e).		P
2.8	**RATINGS AND DIMENSIONS OF LOW VOLTAGE PLUGS**		P
2.8.1	Low voltage flat-pin plugs shall conform to the appropriate dimensions shown in Figure 2.1.		P
	the distance between a live pin of any plug and the edge of the moulding of the plug, shall be not less than 9 mm.	9.66mm	P
	No point on the front face of the plug is more than 0.5 mm.	No protrusion	P
2.8.4*	Compliance with dimensional requirements of Figure 2.1		P
	Low voltage flat-pin or combination of flat and round pin, plugs having ratings up to 15A of Figure 2.1(a1), Figure2.1(c), Figure 2.1(d), Figure 2.1(f) or Figure 2.1(g) type shall comply with the dimensional requirements of Figure 2.1(e).		P
	Plugs with insulated pins, complying with this Standard, need not comply with dimension R20+/-1.0 mm of Figure 2.1(e)		P
2.9	**INTERNAL CONNECTIONS**		N/A
	A loose terminal screw or conductive material cannot bridge any live parts or earthing parts;		N/A
2.10	**ARRANGEMENT OF EARTHING CONNECTIONS**	No earthing pin	N/A
2.12	**MARKING** (No marking is applicable for the integral plug portion. See markings for transformer)		N/A
2.12.6	Configuration of plugs, viewed as from the pins, shall be earth, neutral and active in a clockwise direction. Where there is no earthing pin, the live pins shall conform to this configuration.		P
2.13	**TESTS ON PLUGS**		P
2.13.3	High voltage test		P

Clause	Requirement – Test	Remark	Verdict
2.13.7	Mechanical strength of pin tests		P
2.13.7.1	Tumbling barrel test (modified as follows)		P
	a) 500 times if the mass of the specimen does not exceed 250g.	121g	P
	b) 250 times if the mass of the specimen exceeds 250g.		N/A
	The pins being straightened after 100 drops and at the completion of the test to pass through the appropriate gauge of figure A1, B1 or F1; and following each test the samples shall comply with item (e) of standard): -the pins shall be inspected with normal, or corrected to normal, vision. Insulation may be removed if necessary. Pins shall not be broken or show cracking.		P
2.13.7.2	**Pin bending test**		P
	The point of application of the force shall be 14± 0.5 mm from the face of the plug.		P
	The direction of the force shall be along a line parallel to the face of the plug.		P
	Active and neutral pins shall be forced towards the centroid of the plug and then back to the starting point. Earth pin shall be forced but in one direction only then back to the starting point.		P
	The distance moved from the point of application shall be 7.5 ± 0.3 mm. Any "spring-back" is ignored.		P
	The travel from the starting point to the end point and back to the starting point is one cycle.		P
	The interval between successive cycles shall be a minimum of 10 s.		P
	The duration of one cycle shall be a maximum of 60 s.		P
	The pins shall be tested for 20 complete cycles.		P
	After to tests the pins shall be inspected with normal or corrected to normal vision.		P
	The pin shall not be broken off.		P
2.13.8	**Temperature rise test (modified as follows)**		P
	With 1.1 times rated current prescribed by transformer. The temperature rise of the terminals shall not exceed 45 K.	18K	P
2.13.9	Securement of pins		P
2.13.9.1	Movement of pins		P
	Clamped 5 ±0.5 mm and applying 18 ±1 N to the pin at 14 ± 0.5 mm		P
	The maximum deflection shall not exceed 2.0 mm.	0.5mm	P
2.13.9.2	Fixing of pins		P
	Maintained 50 ±2°C for 1 h. 60 ±0.6 N for 10 min.		P

Clause	Requirement – Test	Remark	Verdict
	The attachment of pins shall be not more than 2.4 mm or if any pin fails to return to within 0.8 mm of its nominal length specified in Figure 2.1 within 5 min of the removal of the test force.	Pins displaced: 0.86mm max; Pins return to 0.48mm max	P
2.13.13*	Tests on the insulation material of insulated pin plugs, if any		P
2.13.13.2*	Pressure test at high temperature		P
	Maintained for 2 h at 160 ±5°C. Force applied through the blade: 2,5 N		P
	Thickness within the area of impression ≥ 50 %. no cracks	Before test: 0.36mm; after test: 0.28mm	P
2.13.13.3*	Static damp heat test		P
	Lower temperature -25 ±3°C		P
	(a) the insulation resistance test in accordance with Clause 2.13.2(e); (b) high voltage test in accordance with Clause 2.13.3 and; (c) abrasion test in accordance with Clause 2.13.13.6.		P
2.13.13.5*	Impact test at low temperature		P
	Maintained at -15 ±2°C for at least 24 h. a height of 100 mm. Four impacts. No cracks.		P
2.13.13.6*	Abrasion test		P
	Plug pins provided with insulating sleeves: 20000 movements, 4 N (apparatus shown in fig. 23). No damage, the insulating sleeve shall not have punctured or rucked up.		P
APPENDIX J	**EQUIPMENT WITH INTEGRAL PINS FOR INSERTION INTO SOCKET-OUTLETS**		P
J1	live pins on equipment with integral pins shall be of the insulated pin type from 3 April 2005		P
J2	REQUIREMENTS FOR THE PLUG PORTION		P
J2.1	DEFINITION		P
J2.2	REQUIREMENTS		P
J2.2.1	PLUG PINS OF PLUG PORTIONS	See clause 2.2	P
J2.2.2	RATINGS AND DIMENSIIONS FOR LOW VOLTAGE PLUG PORTIONS	See clause 2.8	P
J2.2.3	INTERNAL CONNECTION FOR PLUG PORTIONS	See clause 2.9	P
J2.2.4	ARRANGEMENT OF EARTHING CONNECTION FOR PLUG PORTIONS	See clause 2.10	P
J2.2.5	CONFIGURATION OF PLUG PORTIONS	See clause 2.12.6	P
J2.2.6	TESTS	See clause 2.13	P
J2.2.6.1	General		P
J2.2.6.2	HIGH VOLTAGE TEST	See clause 2.13.3	P
J2.2.6.3	Mechanical strength of pin tests	See clause 2.13.7	P
J2.2.6.3.1	Tumbling barrel test	See clause 2.13.7.1	P

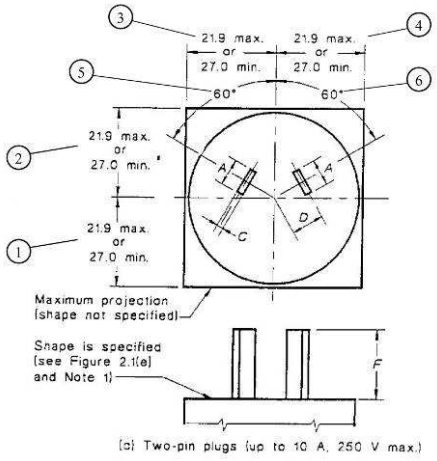
Clause	Requirement – Test	Remark	Verdict
J2.2.6.3.2	Pin bending test	See clause 2.13.7.2	P
J2.2.6.4	TEMPERATURE RISE TEST	See clause 2.13.8	P
J2.2.6.5	SECUREMENT OF PINS OF THE PLUG PORTION	See clause 2.13.9	P
J2.2.6.6	TESTS ON THE INSULATION MATERIAL OF INSULATED PIN PLUG PORTIONS	See clause 2.13.13	P
J2.2.6.7	EQUIPMENT WITH INTEGRAL PINS INTENDED TO BE SUPPORTED BY THE CONTACTS OF A SOCKET-OUTLET		P
	The additional torque, which has to be applied to socket-outlet to maintain the engagement face in the vertical plane, shall not exceed 0.25N.m.	Normal position: 0.054Nm; Reverse position: 0.061Nm	P

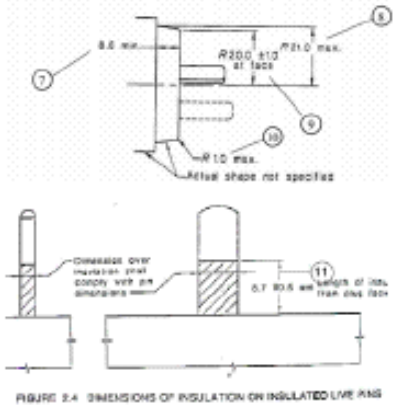
Appendix 8: Dimension Checking for Two-pin plug(Up to 10A rating) According to AS/NZS 3112: 2011+A1:2012+A2:2013

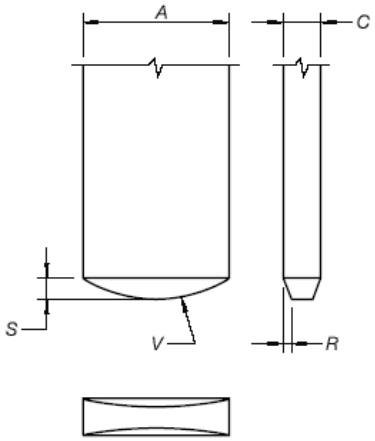
CHECKING OF DIMENSIONS

Dimensions checked by gauge and measurement

Standard sheet Figure 2.1 (c) Standard sheet Figure 2.1 (e) Standard sheet Figure 2.1 (h)







Position	Required (mm)	By Measurement (mm)	By the gauge shown in Figure A1
A	6.35±0.15	6.35	-
B	6.35±0.15	-	-
C	$1.63^{+0.15}_{-0.05}$	1.62	-
D	7.92	-	OK
E	10.31	-	OK
F	17.06±0.4	17.17	-
G	19.94±0.8	-	-
R	0.35±0.05	0.32	-
S	0.90±0.10	0.84	-
T	≥0.60	-	-
V	6	-	OK
1	21.9 max. or 27.0 min.	21.14	-
2	21.9 max. or 27.0 min.	21.14	-
3	21.9 max. or 27.0 min.	62.88	-
4	21.9 max. or 27.0 min.	20.65	-
5	60°	-	OK
6	60°	-	OK
7	8.6 min.	12.15	-
8	21.0 max.	20.75	-
9	20.0±1.0	20.61	-
10	1.0 max	0,34	-
11	8.7±0.5	8.95	-

Appendix 9: Plug dimension tested according IRAM 2063: 2009 + IEC 60884-1: 2002 + A1:2006 (for models of GT*41134-*-***):**

6.4	PLUG PINS MEASUREMENT		
	Measured in mm	**Allowed in mm**	**Verdict**
- Phase Pin:			
Length:	18.03, 18.05, 18.04	18.2 ± 0.2 (18.0/18.4)	P
Wide:	6.25, 6.26, 6.25	6.25 ± 0.1 (6.15/6.35)	P
Thickness:	1.57, 1.55, 1.56	1.55 ± 0.07 (1.48/1.62)	P
- Neutral Pin:			
Length:	18.10, 18.09, 18.08	18.2 ± 0.2 (18.0/18.4)	P
Wide:	6.23, 6.25, 6.23	6.25 ± 0.1 (6.15/6.35)	P
Thickness:	1.51, 1.51, 1.52	1.55 ± 0.07 (1.48/1.62)	P
- Pin of earth			
Length:	-	21.4 ± 0.2 (21.2/21.6)	-
Wide:	-	6.25 ± 0.1 (6.15/6.35)	-
Thickness:	-	1.55 ± 0.07 (1.48/1.62)	-
Perimeter:	11.86, 11.86, 11.85	≥ 8mm	P