



Test Report issued under the responsibility of:
 NCB TÜV SÜD PSB Pte Ltd.
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 Singapore



TEST REPORT
IEC 61347-2-13
Part 2: Particular requirements:
Section Thirteen – d.c. or a.c. supplied electronic controlgear for
LED modules

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Name of Testing Laboratory
 preparing the Report: TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou
 Branch
 5F, Communication Building, 163 Pingyun Rd, Huangpu Ave. West
 Guangzhou 510656, P. R. China

Applicant's name.....:

Address

Test specification:

Standard: IEC 61347-2-13:2014 (Second Edition) used in conjunction with
 IEC 61347-1:2007 (Second Edition) + A1:2010 + A2:2012

Test procedure: CB Scheme

Non-standard test method.....: N/A

Test Report Form No.....: IEC61347_2_13E

Test Report Form(s) Originator.....: Intertek Semko AB

Master TRF: 2014-12

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Test item description: LED DRIVER

Trade Mark: Nalin

Manufacturer.....: Same as applicant

Model/Type reference: NLBxxxxxyW1z4S47 (xxx, yyy, z are variables, for details see
 General product information)

Ratings: Rated input: 100-240V~, 50/60Hz, 0.4A Max.
 Rated output: 4.5-24.0Vd.c., 0.1-2.0A (refer to model list for details)



Testing procedure and testing location:		
☒	CB Testing Laboratory:	TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
Testing location/ address		5F, Communication Building, 163 Pingyun Rd, Huangpu Ave. West Guangzhou 510656, PR China
☐	Associated CB Testing Laboratory:	
Testing location/ address		
Tested by (name, function, signature)		Mr. Terry Chen
Approved by (name, function, signature) ..		Mr. Ricky Zhang
		
☐	Testing procedure: TMP/CTF Stage 1:	
Testing location/ address		
Tested by (name, function, signature)		
Approved by (name, function, signature) ..		
☐	Testing procedure: WMT/CTF Stage 2:	
Testing location/ address		
Tested by (name + signature)		
Witnessed by (name, function, signature) ..		
Approved by (name, function, signature) ..		
☐	Testing procedure: SMT/CTF Stage 3 or 4:	
Testing location/ address		
Tested by (name, function, signature)		
Witnessed by (name, function, signature) ..		
Approved by (name, function, signature) ..		
Supervised by (name, function, signature) :		

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

Attachment No. 1: 1 page of European National and Group Differences according to EN 61347-2-13:2014.
Attachment No. 2: 21 pages of test report for IEC 60598-1:2008 and EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES for EN 60598-1:2008 + A11:2009.
Attachment No. 3: 8 pages of test report for IEC 61347-2-13 STANDARD DIFFERENCES BETWEEN IEC/EN 61347-2-13:2006 AND IEC/EN 61347-2-13:2014.
Attachment No. 4: 1 page of Deviation for Australia and New Zealand of IEC 61347-1.
Attachment No. 5: 2 pages of AS/NZS IEC 61347.2.13:2013 compared to IEC 61347-2-13:2006.
Attachment No. 6: 3 pages of EU plug test data.
Attachment No. 7: 4 pages of UK plug test data.
Attachment No. 8: 12 pages of AU plug test data.
Attachment No. 9: 4 pages of JP plug test data.
Attachment No. 10: 17 pages of photo documentation.

Summary of testing:
Tests performed (name of test and test clause):

The submitted samples were found to comply with the requirements of:

- IEC 61347-2-13(ed.2).
- IEC 61347-1(ed.2);am1;am2.
- EN 61347-2-13:2014.
- EN 61347-1:2008+A1:2011+A2:2013.
- EU plug portion was tested according to EN 50075:1990.
- UK plug portion was tested according to BS 1363-3:1995 + Amd. No. 9543, 14225, 14540, 17437 & A4 and BS 1363-1:1995 + Amd. No. 9541, 14539,17435 & A4.
- AU plug portion was tested according to AS/NZS 3112: 2011 + A1:2012 +A2:2013.
- JP plug portion was tested according to JIS C 8303: 2007.

The selected models for test are the most representative:

Model type	Performed test
NLA063240W1J4S47	Full test
NLA070216W1J4S47, NLA100150W1J4S47, NLA200050W1J4S47	Normal heating test, abnormal heating test, output short-circuit test, output overload test
NLA200050W1J4S47 (with L1 winding)	Normal heating test.

Testing location:

TÜV SÜD Certification and Testing (China) Co., Ltd.
Guangzhou Branch
5F, Communication Building, 163 Pingyun Rd,
Huangpu Ave. West Guangzhou 510656, PR China

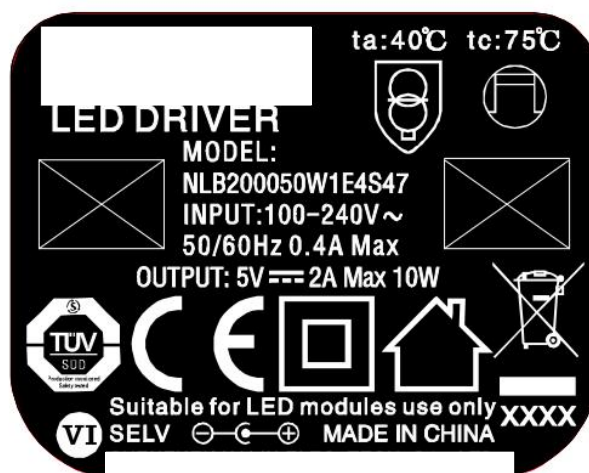
Summary of compliance with National Differences:

List of countries addressed: European group and national difference.

☒ The product fulfils the requirements of EN 61347-1:2008+A1:2011+A2:2013 and EN 61347-2-13:2014.

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.



According to the EU decision 768/2008/EC and German product safety law (ProdSG), the name and address of manufacturer (an EU-based importer or authorized representative if the manufacturer is not based in EU) shall be affixed on the product or, where that is not possible, on its packaging or in a document accompanying the product before the product is placed on EU market.

Remark:

1. Minimum height of "tc" is 2mm, minimum height of CE mark is 5mm, minimum height of WEEE mark is 7mm. The rating labels for other countries shall be evaluated during national approval.
2. tc shall be specified in the manufacture's catalogue.
3. These are representative labels, other are identical with them except model name and output rating.

Test item particulars	
Classification of installation and use	Independent
Supply Connection	Direct plug-in
Protection against electric shock	Class II; SELV
Type of output	Constant voltage
Degree of protection	IP20
ta; tc	ta: 40°C; tc: 75°C

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	2016-03-23
Date (s) of performance of tests.....	2016-03-23 to 2016-03-30

General remarks:	
The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory. "(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. Throughout this report a ☐ comma / ☒ point is used as the decimal separator. Clause numbers between brackets refer to clauses in IEC 61347-1. According to the EU directives which have been aligned with EU NLF (new legislative framework), both of manufacturer and importer's name and address shall be affixed on the product or, where that is not possible, on its packaging or in a document accompanying the product before the product is placed on the EU market. The manufacturer/ Importer has to ensure the appliance placing on the EU market conforms to the applicable EU directives which provide the affixing of the CE marking, such as LVD, EMC, RoHS, ErP, and so on.	
Manufacturer's Declaration per sub-clause 4.2.5 of IEC 61347-1:	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided.....	☐ Yes ☒ Not applicable
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies) : Same as applicant	

General product information:

1. These products are independent non-inherently short-circuit proof safety isolating control gear; they are constant voltage output type and the load can only be LED modules.
2. The test samples are pre-production samples without serial numbers.
3. They are IP20 products with $t_a=40^{\circ}\text{C}$, $t_c=75^{\circ}\text{C}$.
4. The models are direct plug-in equipment with Class II construction.
5. The top enclosure is sealed with bottom enclosure by ultra sonic welding.

Model list:

Model No.	Output voltage (Vdc)	Output current (A)	Max. output power (W)	Transformer
NLBxxxxyyW1z4S47	4.5-6.5	2.00	10.0	NLB250050W1CL
	6.6-10.0	1.50	14.0	NLB150090W1CL
	10.1-14.0	1.20	14.4	NLB120120W1CL
	14.1-17.9	1.00	15.0	NLB100150W1CL
	18.0-24.0	0.70	15.1	NLB060240W1CL

Notes:

1. xxx=010-200 indicates output current range 0.10-2.00A with steps 0.01A,
2. yyy=045-240 indicates output voltage range 4.5-24.0Vdc with steps 0.1V,
3. z= A, U, C, E, K, S, J, I, B indicates type of the AC plug: A for American plug, U for European plug, C for Chinese plug, E for British plug, K for Korean plug, S for Australian plug, J for Japanese plug, I for Argentina plug, B for Brazilian plug.

Difference between models:

All models are identical except different plug portion, model name and some component for different output.

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
4 (4)	GENERAL REQUIREMENTS		P
- (4)	Insulation materials according requirements in Annex N of IEC 61347-1	(see Annex N)	P
- (4)	Compliance of independent controlgear enclosure with IEC 60 598-1		P
- (4)	Built-in magnetic ballast with double or reinforced insulation comply with Annex I of IEC 61347-1		N/A
- (4)	Built-in electronic controlgear with double or reinforced insulation comply with Annex O of IEC 61347-1		N/A
4 (4)	SELV controlgear comply with Annex I of this part 2 and Annex L of IEC 61347-1	(see Annex L)	P
4 (-)	Transformer comply with IEC 61558		P
	Dielectric strength test of insulated winding wires is limited to 3 kV if input voltage $\leq$ 300 V		P

6 (6)	CLASSIFICATION		P
	Built-in controlgear	Yes ☐ No ☒	—
	Independent controlgear	Yes ☒ No ☐	—
	Integral controlgear	Yes ☐ No ☒	—
6 (-)	Auto-wound controlgear	Yes ☐ No ☒	—
	Separating controlgear	Yes ☐ No ☒	—
	Isolating controlgear	Yes ☒ No ☐	—
	SELV controlgear	Yes ☒ No ☐	

7 (7)	MARKING		P
7.1 (7.1)	Mandatory markings		P
	a) mark of origin		P
	b) model number or type reference		P
	c) symbol for independent controlgear, if applicable		P
	d) correlation between interchangeable parts and controlgear marked		N/A
	e) rated supply voltage (V)		P
	supply frequency (Hz)		P
	supply current (A)		P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	f) earthing symbol		N/A
	k) wiring diagram		P
	l) value of t_c		P
	m) symbol for declared temperature		N/A
	t) LUM earthing symbol		N/A
	u) if not SELV maximum working voltage U_{out} between:		N/A
	- output terminals (V)		N/A
	- output terminals and earth (V)		N/A
7.1 (-)	Constant voltage type:	Yes ☒ No ☐	—
	- rated output power P_{rated} (W)	See rating label	P
	- rated output voltage U_{rated} (V)	See rating label	P
	Constant current type:	Yes ☐ No ☒	—
	- rated output power P_{rated} (W)		N/A
	- rated output current I_{rated} (A)		N/A
	- indication if for LED modules only		P
7.1 (7.2)	Marking durable and legible		P
	Rubbing 15 s water, 15 s petroleum; marking legible		P
7.2 (7.1)	Information to be provided, if applicable:		P
	h) declaration on protection against accidental contact		P
	i) cross-section of conductors (mm ²)		P
	j) number, type and wattage of lamp(s)	Indicated in user manual	P
	s) SELV symbol		P
7.2 (-)	- declaration of mains connected windings		N/A

8 (10)	PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS		P
- (10.1)	Controlgear protected against accidental contact with live parts		P
- (A2)	Voltage measured with 50 k Ω	(see Annex A)	P
- (A3)	Voltage > 35 V r.m.s. or > 60 V d.c. or protective impedance device	(see Annex A)	P
- (10.1)	Lacquer or enamel not used for protection or insulation		P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

	Adequate mechanical strength on parts providing protection		P
- (10.2)	Capacitors > 0,5 μ F: voltage after 1 min (V): < 50 V	No X capacitor used, 0V after 1 min.	P
- (10.3)	Controlgear providing SELV		P
	Accessible conductive parts are insulated from live parts by double or reinforced insulation in SELV controlgear		P
	No connection between output circuit and the body or protective earthing circuit		P
	No possibility of connection between output circuit and the body or protective earthing circuit through other conductive parts		P
	SELV outputs separated by at least basic insulation		N/A
	ELV conductive parts insulated as live parts		N/A
	Tests according Annex L of IEC 61347-1		P
- (10.4)	Accessible conductive parts in SELV circuits		P
	Output voltage under load ≤ 25 V r.m.s. or ≤ 60 V d.c.	Max. 23.81V DC	P
	If output voltage > 25 V r.m.s. or > 60 V d.c.; No load output ≤ 35 V peak or ≤ 60 V d.c and touch current does not exceed 0,7 mA (peak) or 2 mA d.c.	Max. 0.408mA	P
	One conductive part is insulated if output voltage or current exceeding the values above and withstand test voltage 500 V		N/A
	Double or reinforced insulation bridged by appropriate and at least two resistors or two Y2 capacitors or one Y1 capacitor	Approved Y1 capacitors used between primary and output circuit.	P
	Y1 or Y2 capacitors comply with IEC 60384-14		P
	Resistors comply with test (a) in 14.1 of IEC 60065		N/A

9 (8)	TERMINALS		N/A
	Screw terminals according section 14 of IEC 60598-1:		N/A
	Separately approved; component list		N/A
	Part of the controlgear		N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Screwless terminals according section 15 of IEC 60598-1:		N/A
	Separately approved; component list		N/A
	Part of the controlgear		N/A

10 (9)	PROVISION FOR PROTECTIVE EARTHING		—
- (9.1)	Provisions for protective earthing		N/A
	Terminal complying with clause 8	Class II equipment	N/A
	Locked against loosening and not possible to loosen by hand		N/A
	Not possible to loosen clamping means unintentionally on screwless terminals		N/A
	Earthing via means of fixing		N/A
	Earthing terminal only used for the earthing of the control gear		N/A
	All parts of material minimizing the danger of electrolytic corrosion		N/A
	Made of brass or equivalent material		N/A
	Contact surface bare metal		N/A
- (9.2)	Provision for functional earthing		N/A
	Comply with clause 8 and 9.1		N/A
- (9.3)	Earth contact via the track on the printed board		N/A
	Test with a current of 25 A between earthing terminal and each of the accessible metal parts; measured resistance (Ω) at ≥ 10 A according 7.2.3 of IEC 60598-1: $< 0,5 \Omega$		N/A
- (9.4)	Earthing of built-in lamp controlgear		N/A
	Earth by means of fixing to earthed metal of luminaire in compliance of 7.2 of IEC 60598-1		N/A
	Earthing terminal only for earthing the built-in controlgear		N/A
- (9.5)	Earthing via independent controlgear		N/A
- (9.5.1)	Earth connection to other equipment		N/A
	Looping or through connection, conductor min. 1,5 mm ² and of copper or equivalent		N/A
	Protective earthing wires in line with 5.3.1.1 and clause 7		N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
- (9.5.2)	Earthing of the lamp compartments powered via the independent lamp controlgear		N/A
	Test with a current of 25 A between input and output earth terminals; measured resistance (Ω) between earthing terminal and each of the accessible metal parts at ≥ 10 A according 7.2.3 of IEC 60598-1: $< 0,5 \Omega$		N/A
	Output earthing terminal marked as in 7.1 t) of IEC 61347-1		N/A

11 (11)	MOISTURE RESISTANCE AND INSULATION		P
	After storage 48 h at 91-95% relative humidity and 20-30 °C measuring of insulation resistance with d.c. 500 V ($M\Omega$):		P
	For basic insulation $\geq 2 M\Omega$	Between L and N: $>100M\Omega$	P
	For double or reinforced insulation $\geq 4 M\Omega$	Between input and enclosure: $>100M\Omega$ Between input and output: $>100M\Omega$	P
	Between primary and secondary circuits in controlgear providing SELV, values in Annex L in IEC 61347-1		P
11 (-)	Adequate insulation between input and output terminals not bounded together in SELV-equivalent controlgear		N/A

12 (12)	ELECTRIC STRENGTH		P
	Immediately after clause 11 electric strength test for 1 min		P
	Basic insulation for SELV, test voltage 500 V		P
	Working voltage ≤ 50 V, test voltage 500 V		N/A
	Working voltage > 50 V ≤ 1000 V, test voltage (V):		P
	Basic insulation, $2U + 1000$ V	Test according to Annex L.8.3: Between L and N: 1500V.	P
	Supplementary insulation, $2U + 1000$ V		N/A
	Double or reinforced insulation, $4U + 2000$ V	Test according to Annex L.8.3: Between input and output: 3000V Between input and enclosure: 3000V	P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	No flashover or breakdown		P
	Solid or thin sheet insulation for double or reinforced insulation fulfil the requirements in Annex N in IEC 61347-1		P

14 (14)	FAULT CONDITIONS		P
- (14)	When operated under fault conditions the controlgear:		P
	- does not emit flames or molten material		P
	- does not produce flammable gases		P
	- protection against accidental contact not impaired		P
	Thermally protected controlgear does not exceed the marked temperature value		N/A
	Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected	(see appended table)	P
- (14.1)	Short-circuit of creepage distances and clearances if less than specified in clause 16 in Part 1 (except between live parts and accessible metal parts)	(see appended table)	P
	Creepage distances on printed boards less than specified in clause 16 in Part 1 provided with coating according to IEC 60664-3		N/A
- (14.2)	Short-circuit or interruption of semiconductor devices	(see appended table)	P
- (14.3)	Short-circuit across insulation consisting of lacquer, enamel or textile	(see appended table)	P
- (14.4)	Short-circuit across electrolytic capacitors	(see appended table)	P
- (14.5)	After the tests has been carried out on three samples:		P
	The insulation resistance $\geq 1 \text{ M}\Omega$:	>100M Ω	P
	No flammable gases		P
	No accessible parts have become live		P
	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		P
- (14.6)	Relevant fault condition tests with high-power supply		—
14 (-)	Temperature declared thermally protected lamp controlgear fulfil requirements in Annex C		N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

15 (-)	TRANSFORMER HEATING		
15.1	General		P
	Transformer comply with clause L.6 and L.7 of IEC 61347-1		P
	Output voltage of SELV controlgear not exceed limits in 10.4 of IEC 61347-1 during the test of 15.1 and 15.2		P
15.2 (-)	Normal operation		P
	Comply with clause L.6 of IEC 61347-1		P
15.3 (-)	Abnormal operation		P
	Comply with clause L.7 of IEC 61347-1		P
	Double LED modules or equivalent load connected in parallel to the output terminals of constant voltage type	Protective circuit operated immediately when double equivalent load was connected.	P
	Double LED modules or equivalent load connected in parallel to the output terminals of constant current type		N/A
15 (-)	During and at the end of the tests no defect impairing safety, nor any smoke or flammable gases produced		P

16 (15)	CONSTRUCTION		P
- (15.1)	Wood, cotton, silk, paper and similar fibrous material		P
	Wood, cotton, silk, paper and similar fibrous material not used as insulation		P
- (15.2)	Printed circuits		P
	Printed circuits used as internal connections complies with clause 14		P
- (15.3)	Plugs and socket-outlets used in SELV or ELV circuits		P
	No dangerous compatibility between output socket-outlet and a plug for socket-outlets for input circuit in relation to installation rules, voltages and frequencies		P
	Plugs and socket-outlets for SELV comply with IEC 60906-3 and IEC 60884-2-4		N/A
	Plugs and socket-outlets for SELV ≤ 3 A, ≤ 25 V r.m.s. or ≤ 60 V d.c. and ≤ 72 W comply with IEC 60906-3 and IEC 60884-2-4 or:		N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	- plugs not able to enter socket-outlets of other standardised system		P
	- socket-outlets not admit plugs of other standardised system		P
	- socket-outlets without protective earth		P

17 (16)	CREEPAGE DISTANCES AND CLEARANCES		P
- (16)	Creepage distances and clearances according to Table 3 and 4, as appropriate	(see appended table)	P
	Controlgears providing SELV comply with L.1 in Annex L		P
	Insulating lining of metallic enclosures		N/A
	Basic insulation on printed boards tested according to clause 14		P
	Distances subjected to both sinusoidal voltage as non-sinusoidal pulses not less than value in either Table 3 or 4		P
	Creepage distances not less than minimum clearance		P

18 (17)	SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS		N/A
	Screws, current-carrying parts and connections in compliance with IEC 60598-1 (clause numbers between parentheses refer to IEC 60598-1)		N/A
(4.11)	Electrical connections		N/A
(4.11.1)	Contact pressure		N/A
(4.11.2)	Screws:		N/A
	- self-tapping screws		N/A
	- thread-cutting screws		N/A
(4.11.3)	Screw locking:		N/A
	- spring washer		N/A
	- rivets		N/A
(4.11.4)	Material of current-carrying parts		N/A
(4.11.5)	No contact to wood or mounting surface		N/A
(4.11.6)	Electro-mechanical contact systems		N/A
(4.12)	Mechanical connections and glands		N/A
(4.12.1)	Screws not made of soft metal		N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Screws of insulating material		N/A
	Torque test: torque (Nm); part		N/A
	Torque test: torque (Nm); part		N/A
	Torque test: torque (Nm); part		N/A
(4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
(4.12.4)	Locked connections:		N/A
	- fixed arms; torque (Nm).....		N/A
	- lampholder; torque (Nm).....		N/A
	- push-button switches; torque 0,8 Nm.....		N/A
(4.12.5)	Screwed glands; force (Nm)		N/A

19 (18)	RESISTANCE TO HEAT, FIRE AND TRACKING		P
- (18.1)	Ball-pressure test:		P
	- part tested; temperature (°C).....	For enclosure:125°C Impression diameter: 940(f1):1.0mm SE1X(GG)(f1): 1.3mm	P
	- part tested; temperature (°C).....	For T1 bobbin: 125°C, Impression diameter: PM-9820: 0.8mm T375J: 0.9mm	P
	- part tested; temperature (°C).....	For plug holder:125°C Impression diameter: 940(f1):1.0mm SE1X(GG)(f1):1.3mm	P
	- part tested; temperature (°C).....		N/A
- (18.2)	Test of printed boards:		P
	- part tested.....	PCB	P
- (18.3)	Glow-wire test (650°C):		P
	- part tested.....	Enclosure for type 940(f1) SE1X(GG)(f1)	P
	- part tested.....		P
- (18.4)	Needle flame test (10 s):		P
	- part tested.....	Transformer bobbin type PM-9820, T375J	P



IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	- part tested..... :	Plug holder for type 940(f1) SE1X(GG)(f1)	P
- (18.5)	Tracking test:		N/A
	- part tested..... :		N/A
	- part tested..... :		N/A
	- part tested..... :		N/A
20(19)	RESISTANCE TO CORROSION		N/A
	- test according 4.18.1 of IEC 60598-1		N/A
	- adequate varnish on the outer surface		N/A

IEC 61347-2-13						
Clause	Requirement + Test				Result - Remark	Verdict
14	TABLE: tests of fault conditions					P
Part	Un	Un	Short-circuited	Dis-connected	Remark	Hazard
Model: NLA063240W1J4S47						
BD1	100V	240V	X	—	Fuse or fusing resistor (FR1) opened immediately, no damaged, no hazards.	No
C1	100V	240V	X	—	Fuse or fusing resistor (FR1) opened immediately, BD1 damaged, no hazards.	No
C2	100V	240V	X	—	Fuse or fusing resistor (FR1) opened immediately, BD1 damaged, no hazards.	No
D1	100V	240V	X	—	Unit shut down immediately, recoverable, no damaged, no hazards.	No
U1 pin1-3	100V	240V	X	—	Unit shut down immediately, recoverable, no damaged, no hazards.	No
U1 pin 1-5	100V	240V	X	—	Fuse or fusing resistor (FR1) opened immediately, U1 damaged, no hazards.	No
U1 pin 3-5	100V	240V	X	—	Fuse or fusing resistor (FR1) opened immediately, U1 damaged, no hazards.	No
RC/RD	100V	240V	X	—	Unit normal work, no damaged, no hazards.	No
T1 pin 1-2	100V	240V	X	—	Unit shut down immediately, recoverable, no damaged, no hazards.	No
T1 pin 4-5	100V	240V	X	—	Unit shut down immediately, recoverable, no damaged, no hazards.	No
D4	100V	240V	X	—	Unit shut down immediately, recoverable, no damaged, no hazards.	No
C8	100V	240V	X	—	Unit shut down immediately, recoverable, no damaged, no hazards.	No
Output +/-	—	264V	Shorted at 20cm distance	—	Unit shut down immediately, recoverable, no damaged, no hazards.	No
Output +/-	—	264V	Shorted at 200cm distance	—	Unit shut down immediately, recoverable, no damaged, no hazards.	No
Output +/-	—	264V	No load	—	Unit had a little power, no damaged, no hazards.	No
Output +/-	—	264V	Double load	—	Unit shut down immediately, recoverable, no damaged, no hazards.	No
Model: NLA070216W1J4S47						

IEC 61347-2-13						
Clause	Requirement + Test				Result - Remark	Verdict
14	TABLE: tests of fault conditions					P
Part	Un	Un	Short-circuited	Dis-connected	Remark	Hazard
Output +/-	—	264V	Shorted at 20cm distance	—	Unit shut down immediately, recoverable, no damaged, no hazards.	No
Output +/-	—	264V	Shorted at 200cm distance	—	Unit shut down immediately, recoverable, no damaged, no hazards.	No
Output +/-	—	264V	No load	—	Unit had a little power, no damaged, no hazards.	No
Output +/-	—	264V	Double load	—	Unit shut down immediately, recoverable, no damaged, no hazards.	No
Model: NLA100150W1J4S47						
Output +/-	—	264V	Shorted at 20cm distance	—	Unit shut down immediately, recoverable, no damaged, no hazards.	No
Output +/-	—	264V	Shorted at 200cm distance	—	Unit shut down immediately, recoverable, no damaged, no hazards.	No
Output +/-	—	264V	No load	—	Unit had a little power, no damaged, no hazards.	No
Output +/-	—	264V	Double load	—	Unit shut down immediately, recoverable, no damaged, no hazards.	No
Models: NLA200050W1J4S47						
Output +/-	—	264V	Shorted at 20cm distance	—	Unit shut down immediately, recoverable, no damaged, no hazards.	No
Output +/-	—	264V	Shorted at 200cm distance	—	Unit shut down immediately, recoverable, no damaged, no hazards.	No
Output +/-	—	264V	No load	—	Unit had a little power, no damaged, no hazards.	No
Output +/-	—	264V	Double load	—	Unit shut down immediately, recoverable, no damaged, no hazards.	No
Remark: S-C=short-circuited All types of fuse resistors and current fuses were considered.						

IEC 61347-2-13								
Clause	Requirement + Test			Result - Remark			Verdict	
17 (16)	TABLES: Creepage distances and clearances						P	
Table 3	Minimum distances (mm) for a.c. (50/60 Hz) sinusoidal voltages						P	
RMS working voltage (V) not exceeding		50	150	250	500	750	1000	
Creepage distances								
Required basic insulation, PTI ≥ 600		0,6	0,8	1,5	3	4	5,5	
Measured		-	-	-	-	-	-	
Required basic insulation, PTI < 600		1,2	1,6	2,5	5	8	10	
Measured		-	-	-	-	-	-	
Required supplementary insulation PTI ≥ 600		-	0,8	1,5	3	4	5,5	
Measured		-	-	-	-	-	-	
Required supplementary insulation PTI < 600		-	1,6	2,5	5	8	10	
Measured		-	-	-	-	-	-	
Required reinforced insulation		-	3,2	5	6	8	11	
Measured		-	-	-	-	-	-	
Clearances								
Required basic insulation		0,2	0,8	1,5	3	4	5,5	
Measured		-	-	-	-	-	-	
Required supplementary insulation		-	0,8	1,5	3	4	5,5	
Measured		-	-	-	-	-	-	
Required reinforced insulation		-	1,6	3	6	8	11	
Measured		-	-	-	-	-	-	
Table 4	Minimum distances (mm) for non-sinusoidal pulse voltages						-	
Rated pulse voltage (peak kV)		2,0	2,5	3,0	4,0	5,0	6,0	8,0
Required clearances		1,0	1,5	2	3	4	5,5	8
Measured		-	-	-	-	-	-	-
Rated pulse voltage (peak kV)		10	12	15	20	25	30	40
Required clearances		11	14	18	25	33	40	60
Measured		-	-	-	-	-	-	-
Rated pulse voltage (peak kV)		50	60	80	100	-	-	-
Required clearances		75	90	130	170	-	-	-
Measured		-	-	-	-	-	-	-
Remark: See appendix table L.11 for details.								

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
A (A)	ANNEX A - TEST TO ESTABLISH WHETHER A CONDUCTIVE PART IS A LIVE PART WHICH MAY CAUSE AN ELECTRIC SHOCK		P
(A.1)	Comply with A.2 or A.3		P
(A.2)	Voltage ≤ 35 V peak or ≤ 60 V d.c. :	23.8Vd.c (max. value is recorded)	P
(A.3)	If voltage > 35 V r.m.s. or > 60 V d.c. or protective impedance device; touch current does not exceed 0,7 mA (peak) or 2 mA d.c. :	0.408mApeak (max. value is recorded)	P
	Comply with Annex G of IEC 60598-1		P
C (C)	ANNEX C – PARTICULAR REQUIREMENTS FOR ELECTRONIC LAMP CONTROLGEAR WITH MEANS OF PROTECTION AGAINST OVERHEATING		--
(C3)	GENERAL REQUIREMENTS		N/A
(C3.1)	Thermal protection means integral with the convertor, protected against mechanical damage		N/A
	Renewable only by means of a tool		N/A
	If function depending on polarity, for cord-connected equipment protection means in both leads		N/A
	Thermal links comply with IEC 60691		N/A
	Electrical controls comply with IEC 60730-2-3		N/A
(C3.2)	No risk of fire by breaking (clause C7)		N/A
(C5)	CLASSIFICATION		N/A
	a) automatic resetting type		—
	b) manual resetting type		—
	c) non-renewable, non-resetting type		—
	d) renewable, non-resetting type		—
	e) other type of thermal protection; description .. :		N/A
(C6)	MARKING		N/A
(C6.1)	Symbol for temperature declared thermally protected ballasts		N/A
(C6.2)	Declaration of the type of protection provided		N/A
(C7)	LIMITATION OF HEATING		N/A
(C7.1)	Preselection test:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Test sample placed for at least 12 h in an oven having temperature ($t_c - 5$) K		N/A
	No operation of the protection device		N/A
(C7.2)	Functioning of protection means:		N/A
	Normal operation of the sample in a test enclosure according to Annex D at an ambient temperature such that ($t_c + 0$; -5) °C is obtained		N/A
	No operation of the protection device		N/A
	Introducing of the most onerous test condition determined during test of clause 14		N/A
	Output of windings connected to the mains supply short-circuited, and other part of the convertor operated under normal conditions		N/A
	Increasing of the current through the windings continuously until operation of the protection means		N/A
	Continuous measuring of the highest surface temperature		N/A
	Ballasts according to C5 a) or C5 e) operated until stable conditions are achieved		N/A
	Automatic-resetting thermal protectors working 3 times		N/A
	Ballasts according to C5 b) working 6 times		N/A
	Ballasts according to C5 c) and C5) d) working once		N/A
	Highest temperature does not exceed the marked value		N/A
	Any overshoot of 10% over the marked value within 15 min		N/A
D (D)	ANNEX D – REQUIREMENTS FOR CARRY OUT THE HEATING TESTS OF THERMALLY PROTECTED LAMP CONTROLGEAR		N/A
	Tests in C7 performed in accordance with Annex D, if applicable		N/A
E (E)	ANNEX E – USE OF CONSTANT S OTHER THAN 4500 IN t_w TESTS		N/A
	Comply with tests according Annex E		N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
F	ANNEX F - DRAUGHT-PROOF ENCLOSURE		P
	Draught-proof enclosure in accordance with the description		P
	Dimensions of the enclosure		P
	Other design; description		N/A
H (H)	ANNEX H - TESTS		P
	All tests performed in accordance with the advice given in Annex H, if applicable		P
I (L)	ANNEX I: PARTICULAR ADDITIONAL REQUIREMENTS FOR INDEPENDENT SELV D.C. OR A.C. SUPPLIED ELECTRONIC CONTROLGEAR FOR LED MODULES		P
(L.3)	Classification		P
	Class I	Yes ☐ No ☒	—
	Class II	Yes ☒ No ☐	—
	Class III	Yes ☐ No ☒	—
	non-inherently short circuit proof controlgear	Yes ☒ No ☐	—
	inherently short circuit proof controlgear	Yes ☐ No ☒	—
	fail safe controlgear	Yes ☐ No ☒	—
	non-short-circuit proof controlgear	Yes ☐ No ☒	—
(L.4)	Marking		P
	Adequate symbols are used		P
(L.5)	Protection against electric shock		P
	Comply with 9.2 of IEC 61558-1		P
(L.6)	Heating		P
	No excessive temperatures in normal use		P
	Value if capacitor t_c marked	Y capacitor: 125°C E capacitor: 105°C	—
	Used material classified as Class	Class B	—
	Comply with tests of clause 14 of IEC 61558-1 with adjustments		P
(L.7)	Short-circuit and overload protection		P
	Comply with tests of clause 15 of IEC 61558-1 with adjustments		P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
(L.8)	Insulation resistance and electric strength		P
(L.8.1)	Conditioned 48 h between 91 % and 95 %		P
(L.8.2)	Insulation resistance		P
	Between input- and output circuits not less than 5 MΩ	> 100MΩ	P
	Between metal parts of class II convertors which are separated from live parts by basic insulation only and the body not less than 5 MΩ		N/A
	Between metal foil in contact with the inner and outer surfaces of enclosures of insulating material not less than 2 MΩ	> 100MΩ	P
(L.8.3)	Electric strength test:		P
	1) Between live parts of input circuits and live parts of output circuits	3000V	P
	2) Over basic or supplementary insulation between:		P
	a) live parts which are or may become of different polarity	1500V	P
	b) live parts and body if intended to be connected to protective earth		N/A
	c) accessible metal parts and a metal rod of the same diameter as the flexible cable or cord	1500V	P
	d) live parts and an intermediate metal part		N/A
	e) intermediate metal parts and the body		N/A
	3) Over reinforced insulation between the body and live parts	3000V	P
	No flashover or breakdown occurred		P
(L.9)	Construction		P
(L.9.1)	Transformer comply with 19.12 of IEC 61558-1 and 19 of IEC 61558-2-6		P
	HF transformer comply with 19 of IEC 61558-2-16		P
(L.10)	Components		P
	Protective devices comply with 20.6 – 20.11 of IEC 61558-1		P
(L.11)	Creepage distances and clearances		P
	1. Insulation between input and output circuits, basic insulation:		N/A
	a) measured values $\geq$ specified values (mm)		N/A
	b) measured values $\geq$ specified values (mm)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	c) measured values $\geq$ specified values (mm) :		N/A
	2. Insulation between input and output circuits, double or reinforced insulation:		P
	a) measured values $\geq$ specified values (mm) :	(See appended table L.11)	P
	b) measured values $\geq$ specified values (mm) :		N/A
	c) measured values $\geq$ specified values (mm) :	(See appended table L.11)	P
	3. Insulation between adjacent <u>input</u> circuits		N/A
	- measured values $\geq$ specified values (mm) :		N/A
	3. Insulation between adjacent <u>output</u> circuits		N/A
	- measured values $\geq$ specified values (mm) :		N/A
	4. Insulation between terminals for external connection:		N/A
	- measured values $\geq$ specified values (mm) :		N/A
	5. Basic or supplementary insulation:		P
	a) measured values $\geq$ specified values (mm) :	(See appended table L.11)	P
	b) measured values $\geq$ specified values (mm) :		N/A
	c) measured values $\geq$ specified values (mm) :		N/A
	d) measured values $\geq$ specified values (mm) :		N/A
	e) measured values $\geq$ specified values (mm) :		N/A
	6. Reinforced insulation or insulation:		P
	Between body and output circuit: measured values $\geq$ specified values (mm) :	(See appended table L.11)	P
	Between body and output circuit if provision against transient voltages: measured values $\geq$ specified values (mm) :		N/A
	7. Distance through insulation:		P
	a) measured values $\geq$ specified values (mm) :		N/A
	b) measured values $\geq$ specified values (mm) :		N/A
	c) measured values $\geq$ specified values (mm) :	(See appended table L.11)	P

(N)	ANNEX N: REQUIREMENTS FOR INSULATION MATERIALS USED FOR DOUBLE OR REINFORCED INSULATION (IEC 61347-1)		P
(N.4)	General requirements		P
(N.4.1)	Material comply with IEC 60085 and IEC 60216 series		P
(N.4.2)	Solid insulation		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Electric strength test at least 5 kV or 1,35 x test voltage in Table N.1		P
	If not classified according IEC 60085 and IEC 60216 series: Electric strength test increased 10 % of 5,5 kV or 1,5 x test voltage in Table N.1		N/A
(N.4.3)	Thin sheet insulation		P
(N.4.3.1)	Thickness and composition of thin sheet insulation		P
	- Inside the ballast and not subjected to handling or abrasion during the production and during maintenance		P
	- Non-separated layers: Min. 3 layers and fulfil mandrel test of 150N		N/A
	- Separated layers: Min. 2 layers and each layer fulfil mandrel test of 50N		N/A
	- Separated layers (alternative): Min. 3 layers and 2/3 of the layers fulfil mandrel test of 100N		P
(N.4.3.2)	Mandrel test (electric strength test during mechanical stress)		P
	Electric strength test after mandrel test:		P
	- Non-separated layers: min. 5 kV or 1,35 x test voltage in Table N.1		N/A
	- 2/3 of min. 3 separated layers: min. 5 kV or 1,25 x test voltage in Table N.1	5 kV	P
	- one of 2 separated layers: min. 5 kV or 1,25 x test voltage in Table N.1		N/A
	No flashover or breakdown occurred		P
(O)	ANNEX O: ADDITIONAL REQUIREMENTS FOR BUILT-IN ELECTRONIC CONTROLGEAR WITH DOUBLE OR REINFORCED INSULATION (IEC 61347-1)		N/A
(O.6)	Marking		N/A
	Marking according clause 7 (7)		N/A
	Special symbol		N/A
	Meaning of the special symbol explained in catalogue		N/A
(O.7)	Protection against accidental contact with live parts		N/A
	Requirements of clause 8 (10)		N/A
	Test finger not possible to make contact with basic insulated metal parts		N/A
(O.8)	Terminals		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Clause 9 (8)		N/A
(O.9)	Provision for earthing		N/A
	Functional earthing terminals comply with clause 9 of part 1		N/A
	No protective earthing terminal		N/A
(O.10)	Moisture resistance and insulation		N/A
	Clause 11 (11)		N/A
(O.11)	Electric strength		N/A
	Clause 12 (12)		N/A
(O.13)	Fault conditions		N/A
	Clause 14 (14)		N/A
	End of test, between live part and accessible metal parts or external parts of insulating material in contact with the supporting surface comply with dielectric strength test reduced to 35 % of values according Table 1 in part 1		N/A
	Insulation resistance according to O.10 between live part and accessible metal parts or external parts of insulating material in contact with the supporting surface not less than 4 MΩ		N/A
(O.14)	Construction		N/A
	Clause 17 (15)		N/A
	Accessible metal parts insulated from live parts by double or reinforced insulation		N/A
	Live part insulated from supporting surface in contact with external faces by double or reinforced insulation		N/A
(O.15)	Creepage distances and clearances		N/A
	Clause 18 (16)		N/A
	Comply with corresponding values for luminaries in IEC 60598-1		N/A
(O.16)	Screws, current-carrying parts and connections		N/A
	Clause 19 (17)		N/A
(O.17)	Resistance to heat and fire		N/A
	Clause 20 (18)		N/A
(O.18)	Resistance to corrosion		N/A
	Clause 21 (19)		N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
J	ANNEX J: PARTICULAR ADDITIONAL SAFETY REQUIREMENTS FOR A.C., A.C./D.C. OR D.C. SUPPLIED ELECTRONIC CONTROLGEAR FOR EMERGENCY LIGHTING		N/A
J.1	General		N/A
	Intended for centralized emergency power supply	Yes ☐ No ☐	—
J.2	Marking		N/A
J.2.1	Mandatory markings		N/A
	a) symbol EL		N/A
	b) rated emergency supply voltage (V)		N/A
J.2.2	Information to be provided if applicable		N/A
	a) Limits of ambient temperature		N/A
	b) Emergency output factor (EOF _x)		N/A
	c) Information if intended for use in luminaires for high-risk task area lighting		N/A
J.3	General notes on tests		N/A
	Length of output cable in tests..... :		N/A
	Load instead of LED lamps/modules..... :		N/A
J.4	Starting conditions		N/A
	Start rated load in emergency mode without adversely affecting the performance		N/A
J.5	Operating condition		N/A
	Comply with the requirements of 7.2 of IEC 62384 at 90% and 110% of rated emergency supply voltage		N/A
J.6	Emergency supply current		N/A
	Emergency supply current not differ more than ±15 %		N/A
	Supply of low impedance and low inductance		N/A
J.7	EMC immunity		N/A
	Comply with the requirements of IEC 61547		N/A
J.8	Pulse voltage from central battery systems		N/A
	Withstand pulses according Table J.1		N/A
J.9	Tests for abnormal conditions		N/A
	Comply with the requirements of 12 of IEC 62384		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
J.10	Comply with the requirements of 13 of IEC 62384		N/A
J.11	Functional safety (EOF _x)		N/A
	Declared emergency output factor (EOF _x) achieved during emergency operation		N/A

	ANNEX 1: components	P
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object/part No.	code	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity
1. Enclosure	B	Sabic Innovative Plastics US LLC	940 (f1)	PC, 94V-0, 120°C, min. Thickness 2.0mm	UL 94	UL E121562
(Alternative)	D	Sabic Innovative Plastics US LLC	SE1X(GG)(f1)	PPE+PS, 94V-1, 105°C, min. Thickness 2.0mm	UL 94	UL E121562
2. Plug holder material for EU plug	B	Sabic Innovative Plastics US LLC	940 (f1)	PC, 94V-0, 120°C, min. thickness: 1.8 mm	UL 94	UL E121562
(Alternative)	D	Sabic Innovative Plastics US LLC	SE1X(GG)(f1)	PPE+PS, 94V-1, 105°C, min. thickness 1.8 mm	UL 94	UL E121562
3. Pin Sleeving material for BS and AU plug	B	Sabic Innovative Plastics US LLC	940 (f1)	PC, 94V-0, 120°C, min. thickness: 1.5 mm	UL 94	UL E121562
(Alternative)	D	Sabic Innovative Plastics US LLC	SE1X(GG)(f1)	PPE+PS, 94V-1, 105°C, min. thickness 1.5 mm	UL 94	UL E121562
4. PCB	B	Shangdong Jinbao Electronics Co., Ltd.	ZD-95(G)F, ZD-90F	94V-0, 130°C	UL 796	UL E141940
(Alternative)	D	Kingboard Laminates Holdings Ltd.	KB-5150	94V-0, 130°C	UL 796	UL E123995
(Alternative)	D	Interchangeable	Interchangeable	94V-0, 130°C	UL 796	UL

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Clause	Requirement + Test			Result - Remark		Verdict
5. Insulation sheet under PCB	B	Dupont Hongji Films Foshan Co., Ltd.	MO31	VTM-2, 105°C, 0.2mm	UL 746	UL E241830
(Alternative)	D	Interchangeable	Interchangeable	Min. VTM-2, 105°C, 0.2mm min.	UL 746	UL
6. Fuse (FR1)	B	Dongguan Better Electronic Technology Co., Ltd.	334-Serie(s)	T1.6A, 250VAC	IEC/EN 60127-1 IEC/EN 60127-3	VDE40025428 UL E300003
(Alternative)	D	Shenzhen Lanson Electronics Co., Ltd.	3K	T1.6A, 250VAC	IEC/EN 60127-1 IEC/EN 60127-3	VDE40010682 UL E221465
(Alternative)	D	XC Electronics (Shen Zhen) Corp. Ltd.	3T-Serie(s)	T1.6A, 250VAC	IEC/EN 60127-1 IEC/EN 60127-3	VDE40019614 UL E249609
(Alternative)	D	XC Electronics (Shen Zhen) Corp. Ltd.	4T-Serie(s)	T1.6A, 250VAC	IEC/EN 60127-1 IEC/EN 60127-3	VDE40029295 UL E249609
(Alternative)	D	Dongguan Anlu Electron Technology Co., Ltd.	32CT	T1A, 250VAC	IEC/EN 60127-1 IEC/EN 60127-3	VDE40039892 UL E365147
(Alternative)	C	Anhui Changsheng Electronics Co., Ltd	RXF21-1W	1W, 3Ω	IEC/EN 60065	VDE40024768 UL E306095 Test with appliance
7. Varistor (MOV) (optional)	B	Lien Shun Electronics Co., Ltd.	10D471K	AC 300V, 40/85/56, fulfilled pulse test 6kV/3kA	IEC 61051-1 IEC 61051-2 IEC 61051-2-2 IEC 60950-1, annex Q	VDE40005858 UL E315524
(Alternative)	D	ShantouHigh-New Technology Dev. Zone Songtian Enterprise Co., Ltd.	STE-10D471K	AC 300V, 40/085/21, fulfilled pulse test 6kV/3kA	IEC 61051-1 IEC 61051-2 IEC 61051-2-2 IEC 60950-1, annex Q	VDE40023049 UL E330837

IEC 61347-2-13						
Clause	Requirement + Test			Result - Remark		Verdict
(Alternative)	D	Success Electronics Co., Ltd.	SVR10D471KA 78BH	AC 300V, 40/085/56, fulfilled pulse test 6kV/3kA	IEC 61051-1 IEC 61051-2 IEC 61051-2-2 IEC 60950-1, annex Q	VDE40030401 UL E330256
(Alternative)	D	Guangdong South Hongming Electronic Science & Technology Co., Ltd.	ZVR-10D471	AC 300V, 40/85/21, fulfilled pulse test 6kV/3kA	IEC 61051-1 IEC 61051-2 IEC 61051-2-2 IEC 60950-1, annex Q	VDE40027789 UL E321851
(Alternative)	D	Cerglass Mfg Inc	10D471K	AC 300V, 40/085/21, fulfilled pulse test 6kV/3kA	IEC 61051-1 IEC 61051-2 IEC 61051-2-2 IEC 60950-1, annex Q	VDE40028836 UL E317616
8. Rectifier Diode (BD1)	C	Interchangeable	Interchangeable	Min. 600V, min. 0.5A	IEC/EN 61347-1 IEC/EN 61347-2-13	Test with appliance
9. Electrolytic Cap. (C1) (C2)	C	Interchangeable	Interchangeable	4.7μF-15μF, min. 400V, 105°C	IEC/EN 61347-1 IEC/EN 61347-2-13	Test with appliance
10. Y1 capacitor (CY1) (Optional)	B	Guangdong South Hongming Electronic Science and Technology Co., Ltd.	F	Max. 2200pF, min. 250VAC, Y1 type, 40/125/21/C	IEC/EN 60384-14	VDE40036393 UL E154899
(Alternative)	D	Shantou High-New Technology Dev. Zone Songtian Enterprise Co., Ltd.	CD-Series	Max. 2200pF, min. 250VAC, Y1 type, 25/125/21/C	IEC/EN 60384-14	VED40025754 UL E208107
(Alternative)	D	DONGGUAN JIANKUN ELECTRONICS TECHNOLOGY CO., LTD	JT series	Max. 2200pF, min. 250VAC, Y1 type, 25/125/21/C	IEC/EN 60384-14	VDE40041534 UL E340699
(Alternative)	D	Xiangtai Electronic (Shenzhen) Co., Ltd.	YO-series	Max. 2200pF, min. 250VAC, Y1 type, 25/125/21/C	IEC/EN 60384-14	VDE40036880 UL E199069

IEC 61347-2-13						
Clause	Requirement + Test			Result - Remark		Verdict
(Alternative)	D	SHENZHEN HAOTIAN ELECTRONIC CO LTD	HT	Max. 2200pF, min. 250VAC, Y1 type, 25/125/21/C	IEC/EN 60384-14	VDE40029300 UL E326483
(Alternative)	D	Shaanxi Huaxing Electronic Development Co.,Ltd	CT7Y1	Max. 2200pF, min. 250VAC, Y1 type, 25/125/21/C	IEC 60384-14	VDE40015542 UL E217400
11. Heat shrinkable tube (for LF1, L1)	A	Shenzhen Woer Heat-Shrinkable Material Co., Ltd.	RSFR	125°C, VW-1, 600V	UL 224	UL
(Alternative)	D	Interchangeable	Interchangeable	125°C, VW-1, 600V	UL 224	UL
12. Output wire	A	Huizhou Desan Enterprise Co., Ltd.	2468 or 1185 or 2464	Min. 20AWG, Min. 80°C, 300VAC,VW-1	UL 758	UL E252840
(Alternative)	D	Excellent Enterprise Co., Ltd.	2468 or 1185 or 2464	Min. 20AWG, Min. 80°C, 300VAC,VW-1	UL 758	UL E322506
(Alternative)	D	Xinya Electronic Co., Ltd.	2468 or 1185 or 2464	Min. 20AWG, Min. 80°C, 300VAC,VW-1	UL 758	UL E170689
(Alternative)	D	Shen Zhen Xin Li Hua Xu Electronics Co., Ltd.	2468 or 1185 or 2464	Min. 20AWG, Min. 80°C, 300VAC,VW-1	UL 758	UL E252561
(Alternative)	D	Shenzhen Linkol Wire & Cable Co., Ltd.	2468 or 1185 or 2464	Min. 20AWG, Min. 80°C, 300VAC,VW-1	UL 758	UL E320450
(Alternative)	D	Dongguan Guneetal Wire & Cable Co., Ltd.	2468 or 1185 or 2464	Min. 20AWG, Min. 80°C, 300VAC,VW-1	UL 758	UL E204204
(Alternative)	D	Shenzhen Zhengerya Technology Co., Ltd.	2468 or 1185 or 2464	Min. 20AWG, Min. 80°C, 300VAC,VW-1	UL 758	UL E242343
(Alternative)	D	Hong Kong Dong Tian Tong Li Electricity Co., Ltd.	2468 or 1185 or 2464	Min. 20AWG, Min. 80°C, 300VAC,VW-1	UL 758	UL E254854

IEC 61347-2-13						
Clause	Requirement + Test			Result - Remark		Verdict
(Alternative)	D	Huizhou Guangfeng Plastic Produce Co., Ltd.	2468 or 1185 or 2464	Min. 20AWG, Min. 80°C, 300VAC,VW-1	UL 758	UL E317231
(Alternative)	D	Shenzhen yuedeng electronics co ltd	2468 or 1185 or 2464	Min. 20AWG, Min. 80°C, 300VAC,VW-1	UL 758	UL E471418
(Alternative)	D	Leader Electric Wire & Cable Co., Ltd.	2468 or 1185 or 2464	Min. 20AWG, Min. 80°C, 300VAC,VW-1	UL 758	UL E154283
(Alternative)	D	Interchangeable	2468 or 1185 or 2464	Min. 20AWG, Min. 80°C, 300VAC,VW-1	UL 758	UL
13. Transformer (T1)	C	Shenzhen Hua Zhi Chuang Electronic Technology Co., Ltd.	NLB250050W1 CL, NLB150090W1 CL, NLB120120W1 CL, NLB100150W1 CL, NLB060240W1 CL,	1000μH±5%, Class B (see details in table of transformer details)	IEC/EN 61347-1 IEC/EN 61347-2-13	Test with appliance
(Alternative)	C	Shenzhen Jiameirui Electronic Co., Ltd.	NLB250050W1 CL, NLB150090W1 CL, NLB120120W1 CL, NLB100150W1 CL, NLB060240W1 CL,	1000μH±5%, Class B (see details in table of transformer details)	IEC/EN 61347-1 IEC/EN 61347-2-13	Test with appliance
Material used in Transformer T1:						
-Triple insulation wire	B	Rubadue Wire Co., Inc.	TCA 3	Reinforced insulation wire, min. 155°C	IEC/EN 60950-1, IEC/EN 61558-1, IEC 61558-2-16 (ed.1);am1	VDE40000223
(Alternative)	D	Rubadue Wire Co., Inc.	Tefzel 210 Serie(s)	Reinforced insulation wire, min. 155°C	IEC/EN 60950-1, IEC/EN 61558-1, IEC 61558-2-16 (ed.1);am1	VDE136743

IEC 61347-2-13						
Clause	Requirement + Test			Result - Remark		Verdict
- Bobbin	B	Sumitomo Bakelite Co., Ltd.	PM-9820	Phenolic, V-0, 150°C	UL 94	UL E41429
(Alternative)	D	Chang Chun Plastics Co., Ltd.	T375J	Phenolic, V-0, 150°C	UL 94	UL E59481
- Primary magnet wire	B	Tai-I Electric Wire & Cable Co., Ltd.	UEW	130°C	UL 1446	UL E85640
(Alternative)	D	Wan Jia Special Wire Mfr (Xinyu) Co., Ltd.	UEWB	130°C	UL 1446	UL E317291
(Alternative)	D	Shantou Shengang Electrical Industrial Co., Ltd.	UEW/130	130°C	UL 1446	UL E239508
(Alternative)	D	Shen Zhen City Chengwei Industry Co., Ltd.	2UEW, MW75-C	130°C	UL 1446	UL E227475
(Alternative)	D	Tongling Nonferrous Copper Crown Electrical Co., Ltd.	UEW, MW75	130°C	UL 1446	UL E217937
- Insulation tape	B	Jingjiang Yahua Pressure Sensitive Glue Co., Ltd.	PZ or CT	130°C	UL 510	UL E165111
- Varnish	B	Hitachi Chemical Co., Ltd.	WP-2952F-2G	130°C	UL 1446	UL E72979
(Alternative)	D	Wu Jiang Taihu Insulating Material Co., Ltd.	ET-90(a) T-4260(a)	155°C	UL 1446	UL E228349
- Tubing	B	Great Holding Industrial Co., Ltd.	TFL or TFT	200°C	UL 224	UL E156256

IEC 61347-2-13						
Clause	Requirement + Test			Result - Remark		Verdict
14. Inductor (optional LF1/L1)	B	Dongguan city junhao electronic technology co., LTD	EE10.2	30mH Min.	/	Tested with appliance
(Alternative)	D	Huizhou fuyu Electronic Technology Co., Ltd.	EE10.2	30mH Min.	/	Tested with appliance
(Alternative)	D	Shenzhen hundred million de electronics co ltd	EE10.2	30mH Min.	/	Tested with appliance
(Alternative)	D	Dongguan city junhao electronic technology co., ltd	DR8*10	2mH Min.	/	Tested with appliance
Material used in Transformer L1, LF1:						
-Magnet wire of LF1 ,L1	B	Pacific electric wire & cable (shenzhen) co., ltd.	UEW/U	MW 75-C, 130°C	UL1446	UL E201757
(Alternative)	D	Tongling nonferrous copper crown electrical co ltd	UEW	MW 75-C, 130°C	UL1446	UL E217937
(Alternative)	D	Dong guan yida industrial co ltd	2UEW/130	MW 75-C, 130°C	UL1446	UL E344055
-Bobbin of LF1	B	Chang chun plastics co., ltd.	T375J	V-0, 150 °C	UL94 UL746C	UL E59481
- Insulation tape of LF1	B	Jingjiang yahua pressure sensitive glue co., ltd.	PZ, CT	130°C	UL 510	UL E165111
(Alternative)	D	Suzhou mailaduona electric material co ltd	JY312#	130°C	UL 510	UL E188295

IEC 61347-2-13						
Clause	Requirement + Test			Result - Remark		Verdict
-Varnish of LF1	B	Zhuhai changxian new materials technology co ltd	E962	130°C	UL 1446	UL E335405
(Alternative)	D	Qualipoly chemical corp	1032*	130°C	UL 1446	UL E213437

The codes above have the following meaning:

- A - The component is replaceable with another one, also certified, with equivalent characteristics
- B - The component is replaceable if authorised by the test house
- C - Integrated component tested together with the appliance
- D - Alternative component

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX 2: screw terminals (part of the luminaire)	N/A
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(14)	SCREW TERMINALS		N/A
(14.2)	Type of terminal		—
	Rated current (A)		—
(14.3.2.1)	One or more conductors		N/A
(14.3.2.2)	Special preparation		N/A
(14.3.2.3)	Terminal size		N/A
	Cross-sectional area (mm ²)		N/A
(14.3.3)	Conductor space (mm)		N/A
(14.4)	Mechanical tests		N/A
(14.4.1)	Minimum distance		N/A
(14.4.2)	Cannot slip out		N/A
(14.4.3)	Special preparation		N/A
(14.4.4)	Nominal diameter of thread (metric ISO thread) .		N/A
	External wiring		N/A
	No soft metal		N/A
(14.4.5)	Corrosion		N/A
(14.4.6)	Nominal diameter of thread (mm)		N/A
	Torque (Nm)		N/A
(14.4.7)	Between metal surfaces		N/A
	Lug terminal		N/A
	Mantle terminal		N/A
	Pull test; pull (N)		N/A
(14.4.8)	Without undue damage		N/A

	ANNEX 3: screwless terminals (part of the luminaire)	N/A
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(15)	SCREWLESS TERMINALS		N/A
(15.2)	Type of terminal		—
	Rated current (A)		—
(15.3.1)	Material		N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
(15.3.2)	Clamping		N/A
(15.3.3)	Stop		N/A
(15.3.4)	Unprepared conductors		N/A
(15.3.5)	Pressure on insulating material		N/A
(15.3.6)	Clear connection method		N/A
(15.3.7)	Clamping independently		N/A
(15.3.8)	Fixed in position		N/A
(15.3.10)	Conductor size		N/A
	Type of conductor		N/A
(15.5)	Terminals and connections for internal wiring		N/A
(15.5.1)	Mechanical tests		N/A
(15.5.1.1.1)	Pull test spring-type terminals (4 N, 4 samples).....:		N/A
(15.5.1.1.2)	Pull test pin or tab terminals (4 N, 4 samples).....:		N/A
	Insertion force not exceeding 50 N		N/A
(15.5.1.2)	Permanent connections: pull-off test (20 N)		N/A
(15.6)	Electrical tests		N/A
	Voltage drop (mV) after 1 h (4 samples):		N/A
	Voltage drop of two inseparable joints		N/A
	Number of cycles:		—
	Voltage drop (mV) after 10th alt. 25th cycle (4 samples):		N/A
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples):		N/A
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples):		N/A
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples):		N/A
(15.7)	Terminals external wiring		N/A
	Terminal size and rating		N/A
(15.8.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N):		N/A
	Pull test pin or tab terminals (4 samples); pull (N):		N/A
(15.9)	Contact resistance test		N/A

IEC 61347-2-13										
Clause	Requirement + Test					Result - Remark				Verdict
	Voltage drop (mV) after 1 h									N/A
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)										
	Voltage drop of two inseparable joints									
	Voltage drop after 10th alt. 25th cycle									
	Max. allowed voltage drop (mV)..... :									—
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)										
	Voltage drop after 50th alt. 100th cycle									
	Max. allowed voltage drop (mV)..... :									—
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)										
	Continued ageing: voltage drop after 10th alt. 25th cycle									
	Max. allowed voltage drop (mV)..... :									—
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)										
	Continued ageing: voltage drop after 50th alt. 100th cycle									
	Max. allowed voltage drop (mV)..... :									—
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)										

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

L.6	TABLE: Heating test				P	
	Type reference	NLA063240W1J4S47			—	
	Lamp used.....	LED module			—	
	Mounting position	As in normal use			—	
	Test voltage.....	a. 90V/60Hz Horizontal b. 264V/50Hz Horizontal c. 90V/60Hz Vertical d. 264V/50Hz Horizontal			—	
Thermocouple locations		Measured temp. (°C)				Temp limits (°C)
		a	b	c	d	
Plug holder inside		61.2	57.8	64.7	58.9	Ref.
MOV1 body		75.6	67.9	80.8	67.4	85
LF1 winding		90.6	78.6	96.6	71.5	130
C1 body		82.4	74.8	86.2	72.0	105
C2 body		84.8	79.9	86.2	76.9	105
PCB near BD1		93.0	91.0	95.4	89.3	130
PCB near U1		82.9	73.4	88.2	72.7	130
T1 winding		98.1	98.9	97.0	95.6	110
T1 core		96.9	98.7	96.3	94.7	110
CY1 body		78.1	79.2	76.8	76.0	125
PCB near D4		92.5	102.6	91.4	100.4	130
C7 body		76.8	81.9	75.6	79.8	105
LF2 winding		69.8	72.5	69.0	71.3	130
Output cord		59.8	61.4	59.4	60.9	80
Internal enclosure (top on T1)		71.9	73.4	69.3	70.2	120
Internal enclosure (bottom of T1)		77.1	78.9	74.9	75.1	120
External enclosure (top on T1)		69.9	70.7	65.9	66.4	75
External enclosure (bottom of T1)		71.6	72.8	68.3	68.1	75
Support		58.4	55.6	61.7	57.2	85
Test corner		44.0	43.4	45.0	45.4	Ref.

IEC 61347-2-13					
Clause	Requirement + Test			Result - Remark	Verdict
Ambient	40.0	40.0	40.0	40.0	--

L.6	TABLE: Heating test				P	
	Type reference :	NLA070216W1J4S47			—	
	Lamp used..... :	LED module			—	
	Mounting position :	As in normal use			—	
	Test voltage..... :	a. 90V/60Hz Horizontal b. 264V/50Hz Horizontal c. 90V/60Hz Vertical d. 264V/50Hz Horizontal			—	
Thermocouple locations		Measured temp. (°C)				Temp limits (°C)
		a	b	c	d	
Plug holder inside		64.3	65.7	65.9	66.4	Ref.
MOV1 body		78.6	68.3	81.6	70.0	85
LF1 winding		96.0	72.5	98.6	73.9	130
C1 body		87.8	75.1	89.2	76.0	105
C2 body		91.9	82.3	91.8	81.8	105
PCB near BD1		82.2	72.8	84.5	73.7	130
PCB near U1		96.2	91.9	95.8	90.6	130
T1 winding		103.4	99.0	97.0	94.2	110
T1 core		97.7	97.4	94.6	94.0	110
CY1 body		78.1	78.5	75.5	75.1	125
PCB near D4		93.5	103.2	91.0	100.2	130
C7 body		76.6	81.2	74.2	78.0	105
LF2 winding		73.3	76.2	70.7	72.7	130
Output cord		62.0	64.0	59.7	60.9	80
Internal enclosure (top on T1)		80.4	80.9	75.8	76.0	120
Internal enclosure (bottom of T1)		81.3	84.4	76.7	77.6	120
External enclosure (top on T1)		70.9	71.1	64.8	66.3	75
External enclosure (bottom of T1)		74.4	74.1	66.1	67.8	75
Support		61.4	63.7	62.9	64.5	85

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

Test corner	45.0	50.2	48.8	49.7	Ref.
Ambient	40.0	40.0	40.0	40.0	--

L.6	TABLE: Heating test				P	
	Type reference	NLA100150W1J4S47			—	
	Lamp used.....	LED module			—	
	Mounting position	As in normal use			—	
	Test voltage.....	a. 90V/60Hz Horizontal b. 264V/50Hz Horizontal c. 90V/60Hz Vertical d. 264V/50Hz Horizontal			—	
Thermocouple locations		Measured temp. (°C)				Temp limits (°C)
		a	b	c	d	
Plug holder inside		64.6	60.2	64.7	60.6	Ref.
MOV1 body		79.1	66.5	80.6	66.9	85
LF1 winding		94.5	71.0	93.9	70.6	130
C1 body		88.1	72.7	87.9	73.0	105
C2 body		95.9	84.2	94.3	82.5	105
PCB near BD1		82.8	70.8	83.8	71.1	130
PCB near U1		95.6	89.2	93.6	87.1	130
T1 winding		102.8	99.4	98.9	95.1	110
T1 core		96.7	96.0	93.4	92.1	110
CY1 body		80.9	79.6	76.9	75.3	125
PCB near D4		102.0	106.5	99.1	103.1	130
C7 body		82.8	84.7	79.8	84.5	105
LF2 winding		71.0	75.7	66.0	72.0	130
Output cord		61.9	62.2	60.4	61.1	80
Internal enclosure (top on T1)		83.1	82.3	78.2	77.2	120
Internal enclosure (bottom of T1)		87.4	87.1	83.4	82.8	120
External enclosure (top on T1)		72.3	73.3	67.7	68.2	75
External enclosure (bottom of T1)		74.1	73.8	69.1	68.6	75

IEC 61347-2-13					
Clause	Requirement + Test			Result - Remark	Verdict
Support	59.1	56.3	59.9	57.4	85
Test corner	48.5	51.3	43.5	47.4	Ref.
Ambient	40.0	40.0	40.0	40.0	--

L.6	TABLE: Heating test				P	
	Type reference :	NLA200050W1J4S47			—	
	Lamp used..... :	LED module			—	
	Mounting position :	As in normal use			—	
	Test voltage..... :	a. 90V/60Hz Horizontal b. 264V/50Hz Horizontal c. 90V/60Hz Vertical d. 264V/50Hz Horizontal			—	
Thermocouple locations		Measured temp. (°C)				Temp limits (°C)
		a	b	c	d	
Plug holder inside		64.9	60.6	66.2	60.7	Ref.
MOV1 body		81.5	68.6	83.1	70.8	85
LF1 winding		98.5	76.4	101.8	78.2	130
C1 body		89.8	75.9	91.5	77.6	105
C2 body		96.8	87.6	97.6	87.4	105
PCB near BD1		94.0	81.3	95.1	82.3	130
PCB near U1		101.6	94.5	101.5	93.9	130
T1 winding		92.4	89.4	89.1	85.4	110
T1 core		87.7	86.8	84.7	82.6	110
CY1 body		86.2	85.2	83.4	81.4	125
PCB near D4		87.5	89.8	84.3	85.0	130
C7 body		82.5	86.1	79.4	80.0	105
LF2 winding		84.1	85.9	82.4	82.2	130
Output cord		72.8	74.1	71.1	70.9	80
Internal enclosure (top on T1)		79.5	79.4	73.8	72.9	120
Internal enclosure (bottom of T1)		79.3	79.4	75.9	74.4	120
External enclosure (top on T1)		70.3	70.0	63.4	62.8	75

IEC 61347-2-13					
Clause	Requirement + Test			Result - Remark	Verdict
External enclosure (bottom of T1)	72.7	72.9	68.3	67.1	75
Support	59.3	56.5	60.1	56.4	85
Test corner	49.6	51.5	49.2	48.9	Ref.
Ambient	40.0	40.0	40.0	40.0	--

L.6	TABLE: Heating test				P
	Type reference	NLA200050W1J4S47(with L1 winding)			—
	Lamp used.....	LED module			—
	Mounting position	As in normal use			—
	Test voltage	a. 90V/60Hz Vertical			—
Thermocouple locations		Measured temp. (°C)			Temp limits (°C)
		a	--	--	--
L1 winding		83.2	--	--	130
Ambient		40.0	--	--	--

L.7	TABLE: Abnormal condition-for constant current type, thermocouples				P
	Type reference	NLA063240W1J4S47			—
	Condition	ta:40.0°C			—
	Lamp used	LED modules			—
	Mounting position	As in normal use			—
	Test voltage(V)	264.0V			—
temperature rise(K) of part		Test (°C) (Max. value recorded)		Limit (°C)	
Thermocouple locations		(°C)		(°C)	
T1 coil		117.6		165	
T1 core		116.9		165	
Output wire		67.2		105	
Enclosure outside on T1		86.1		105	
Support		70.0		105	
Ambient		40.0		--	

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

Remark: Output overload

L.7	TABLE: Abnormal condition-for constant current type, thermocouples		P
	Type reference	NLA070216W1J4S47	—
	Condition	ta:40.0°C	—
	Lamp used	LED modules	—
	Mounting position	As in normal use	—
	Test voltage(V)	264.0V	—
temperature rise(K) of part		Test (°C) (Max. value recorded)	Limit (°C)
Thermocouple locations		(°C)	(°C)
T1 coil		107.0	165
T1 core		105.8	165
Output wire		67.3	105
Enclosure outside on T1		77.9	105
Support		70.4	105
Ambient		40.0	--
Remark: Output overload			

L.7	TABLE: Abnormal condition-for constant current type, thermocouples		P
	Type reference	NLA100150W1J4S47	—
	Condition	ta:40.0°C	—
	Lamp used	LED modules	—
	Mounting position	As in normal use	—
	Test voltage(V)	264.0V	—
temperature rise(K) of part		Test (°C) (Max. value recorded)	Limit (°C)
Thermocouple locations		(°C)	(°C)
T1 coil		110.6	165
T1 core		107.5	165
Output wire		67.3	105
Enclosure outside on T1		79.4	105

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
Support		58.2	105
Ambient		40.0	--
Remark: Output overload			

L.7	TABLE: Abnormal condition-for constant current type, thermocouples		P
	Type reference	NLA200050W1J4S47	—
	Condition	ta:40.0°C	—
	Lamp used	LED modules	—
	Mounting position	As in normal use	—
	Test voltage(V)	264.0V	—
temperature rise(K) of part		Test (°C) (Max. value recorded)	Limit (°C)
Thermocouple locations		(°C)	(°C)
T1 coil		113.8	165
T1 core		109.3	165
Output wire		81.3	105
Enclosure outside on T1		97.2	105
Support		70.0	105
Ambient		40.0	--
Remark: Output overload			

15.3	TABLE: transformer heating–abnormal condition		P
	Type reference	NLA063240W1J4S47, NLA070216W1J4S47, NLA100150W1J4S47, NLA200050W1J4S47	—
	Lamp used	LED modules	—
	Mounting position	As in normal use	—
	Test voltage	90V and 264V	—
temperature rise(K) of part		Test (K)	Limit(K)
Condition:		—	—
T1 winding		—	—
T1 core		—	—

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
Enclosure outside	—	—	—
Ambient	—	—	—
Remark: 1. Output shutdown immediately for output connect double the LED modules for all models.			

L.11	TABLES: Creepage distances and clearances measurement						P
creepage distance Cr. and clearance Cl. at/of:	Up (V)	U rms. (V)	Table L.5	Measured		Required in table L.5	
				Cl. (mm)	Cr. (mm)	Cl. (mm)	Cr. (mm)
Basic Insulation							
Line and Neutral before FR1	—	240	5a	5.0	5.0	2.4	2.5
Two terminals of FR1	—	240	5a	3.0	3.0	2.4	2.5
Reinforced or Double Insulation							
Live parts and outer surface	—	240	6	6.0	6.0	4.5	4.8
Two ends of CY1	—	257	2a	6.5	6.5	4.8	5.2
Pri. Part to sec. part (except T1)	—	257	2a	8.0	8.0	4.8	5.2
T1 core to secondary component	—	257	2a	6.1	6.1	4.8	5.2
T1 core to secondary pins	—	257	2a	6.5	6.5	4.8	5.2
Primary coil to secondary coil		257	2a	6.5	6.5	4.8	5.2
DTI (Distance through insulation)							
DTI at/of:	Up (V)	U rms. (V)	Table L.5	Measured		Required in table L.5 DTI (mm)	
				DTI (mm)	Layers of insulating tape		
Supplementary Insulation							
—	—	—	—	—	—	—	
Reinforced insulation							
Enclosure	—	240	7c	2.0	—	0.9	
Tape on outer of T1	—	257	1c	0.2	3	0.1 [output<25VA] 0.2 [25VA≤ output≤100VA] 0.3 [output>100VA]	
Remark:							
1. Above limits are considered under normal pollution and PTI < 600 condition.							
2. Minimum measured value recorded.							



Attachment No. 1

ATTACHMENT TO TEST REPORT IEC 61347-2-13 EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES Part 2-13: Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules	
Differences according to	EN 61347-2-13:2014 used in conjunction with EN 61347-1:2008+A1:2011+A2:2013
Attachment Form No.	EU_GD_IEC61347_2_13E
Attachment Originator	TÜV SÜD
Master Attachment	2015-01
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	CENELEC COMMON MODIFICATIONS (EN)	—
	No Common modifications	N/A

ZA	ANNEX ZA, SPECIAL NATIONAL CONDITIONS (EN)	—
	No special National conditions	N/A

Attachment No. 10

Details of: NLBxxxxyyW1U4S47 (Europe plug)



Details of: NLBxxxxyyW1U4S47 (Europe plug)



Attachment No. 10

Details of: NLBxxxxyyW1U4S47 (Europe plug)



Details of: NLBxxxxyyW1U4S47 (Europe plug)



Attachment No. 10

Details of: ..NLBxxxxyyW1U4S47 (Europe plug).....



Details of: ..NLBxxxxyyW1S4S47 (Australia plug).....



Attachment No. 10

Details of: NLBxxxxyyW1S4S47 (Australia plug)

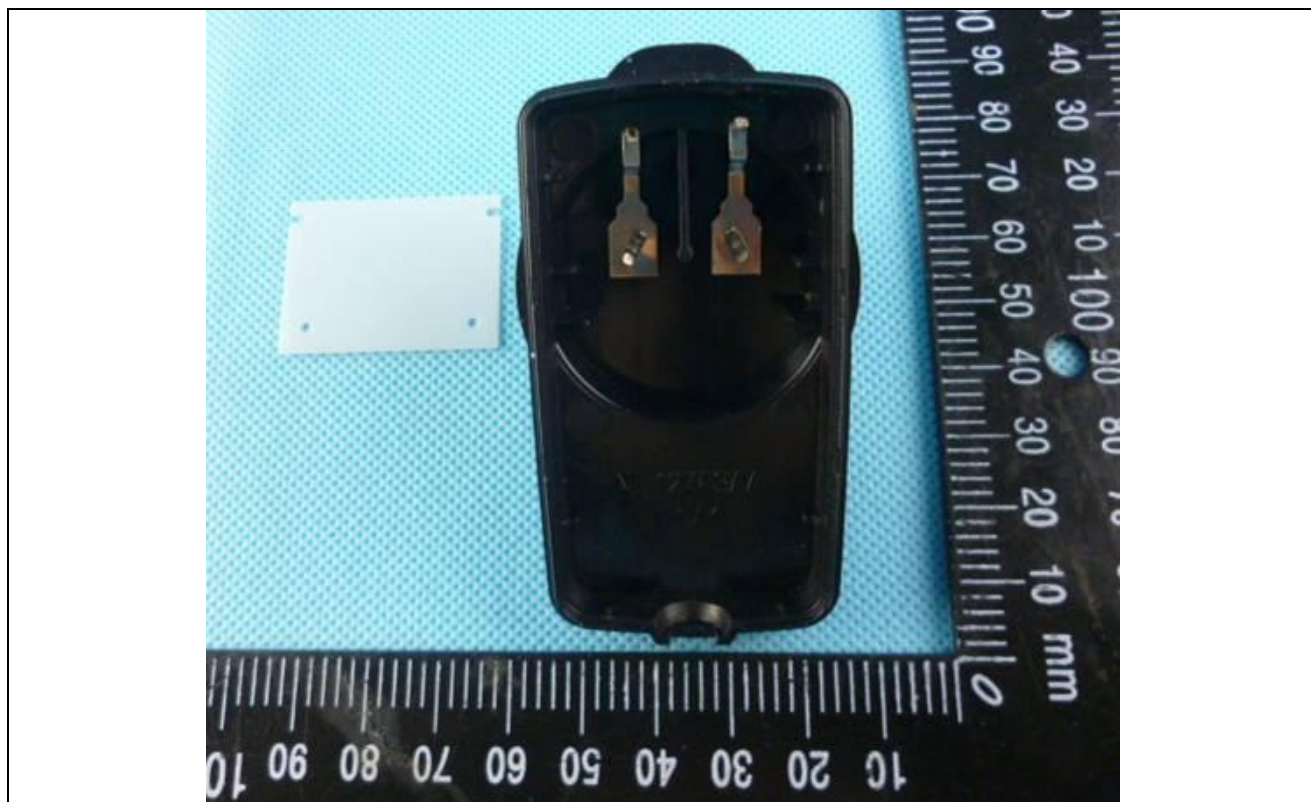


Details of: NLBxxxxyyW1S4S47 (Australia plug)



Attachment No. 10

Details of: NLBxxxxyyW1S4S47 (Australia plug)



Details of: NLBxxxxyyW1E4S47 (United Kingdom plug)

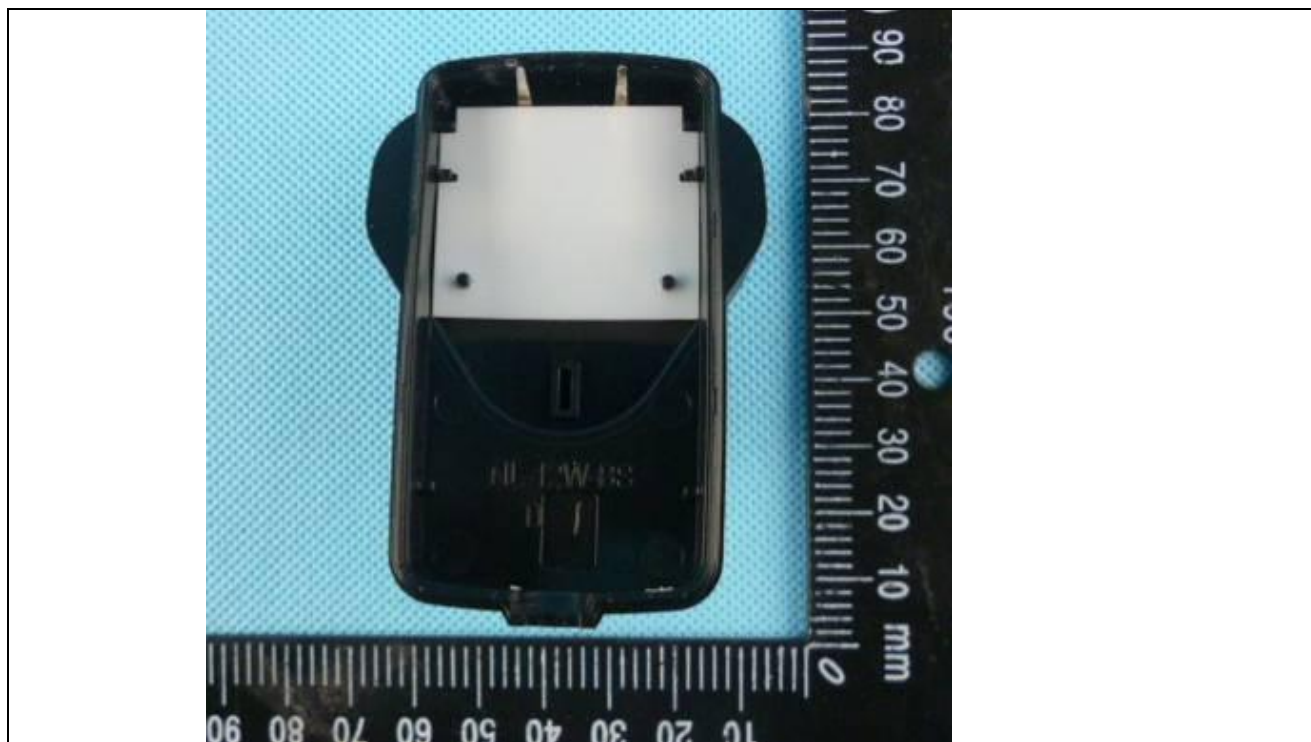


Attachment No. 10

Details of: NLBxxxxyyW1E4S47 (United Kingdom plug)

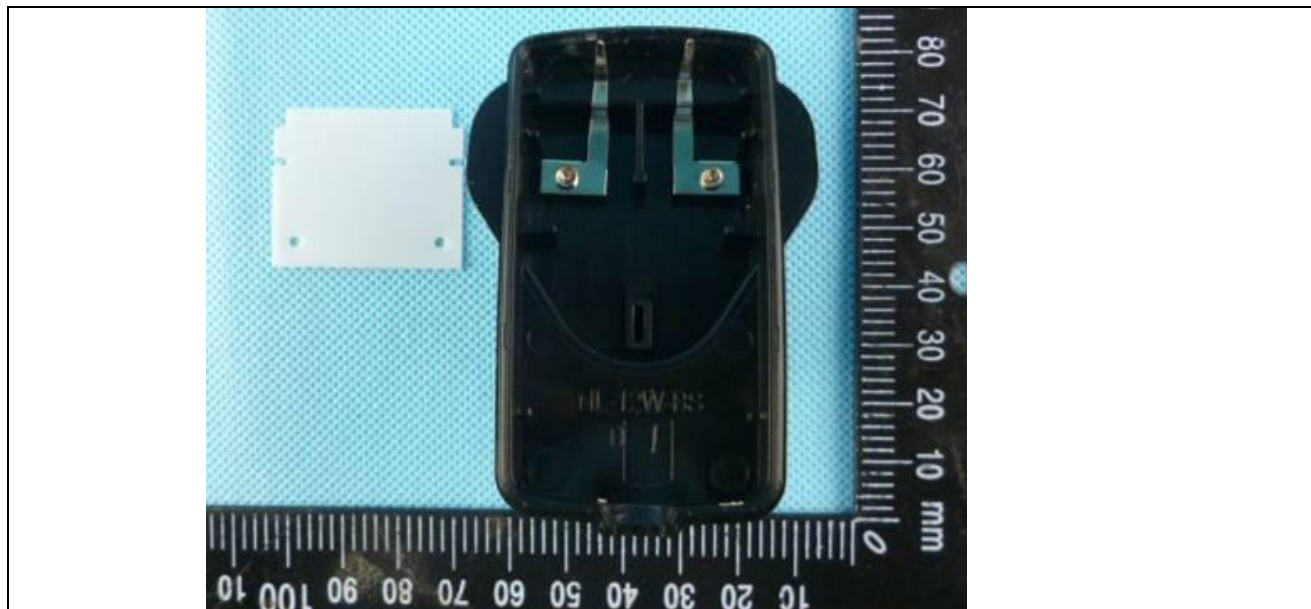


Details of: NLBxxxxyyW1E4S47 (United Kingdom plug)



Attachment No. 10

Details of: NLBxxxxyyW1E4S47 (United Kingdom plug)



Details of: NLBxxxxyyW1J4S47 (Japan plug)



Attachment No. 10

Details of: NLBxxxxyyW1J4S47 (Japan plug)

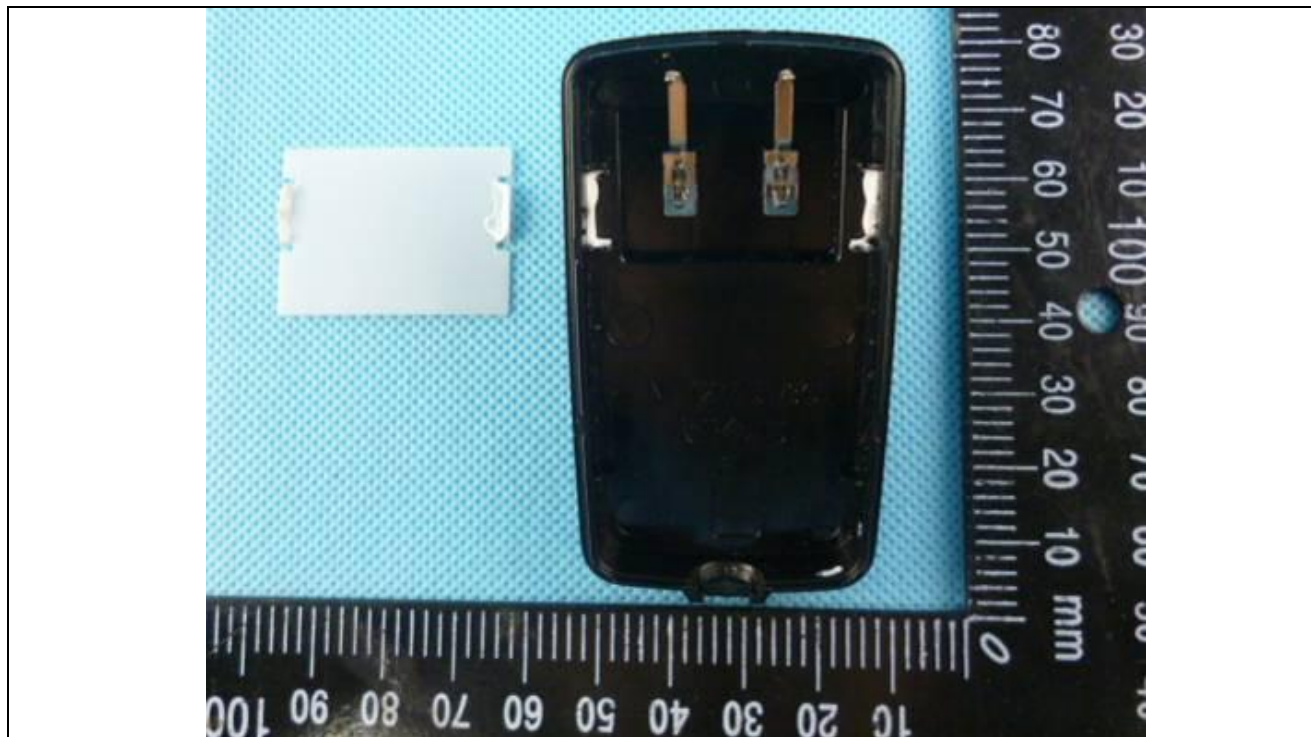


Details of: NLBxxxxyyW1J4S47 (Japan plug)

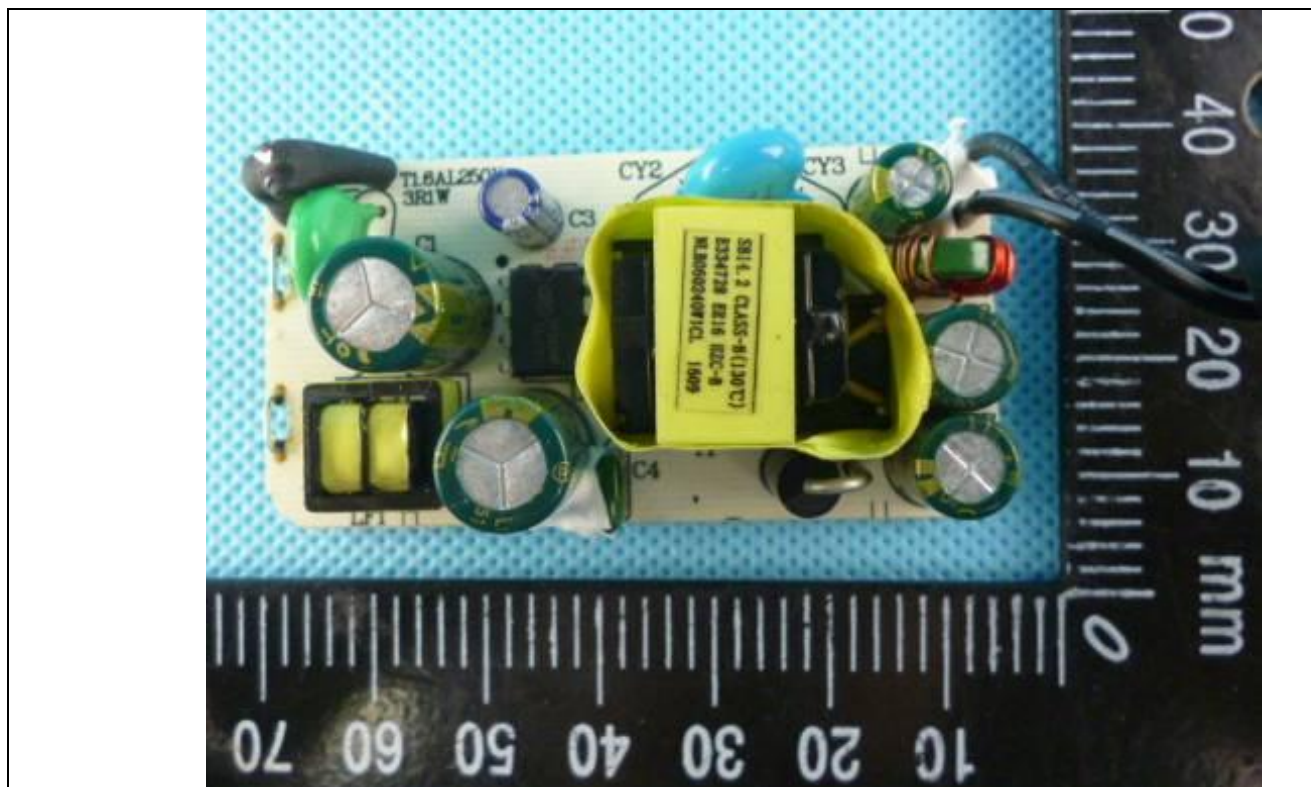


Attachment No. 10

Details of: NLBxxxxyyW1J4S47 (Japan plug)

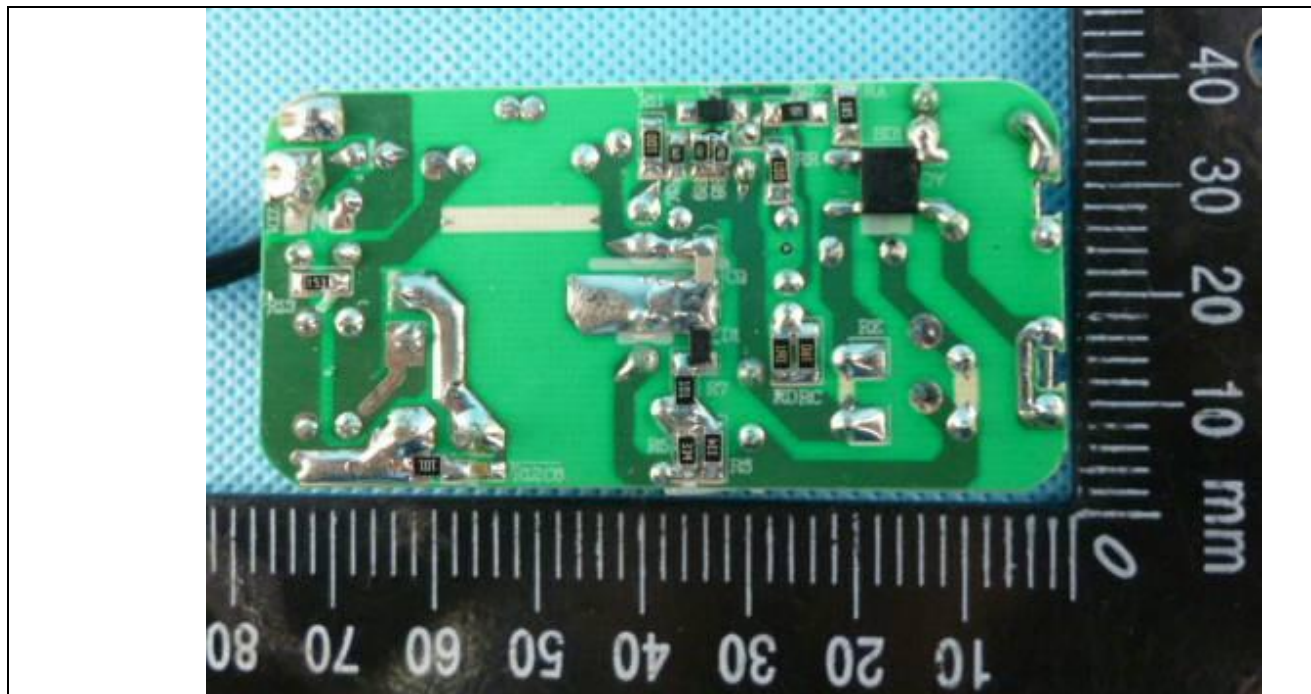


Details of: PCB view (PCB with LF1, CY1, MOV1)

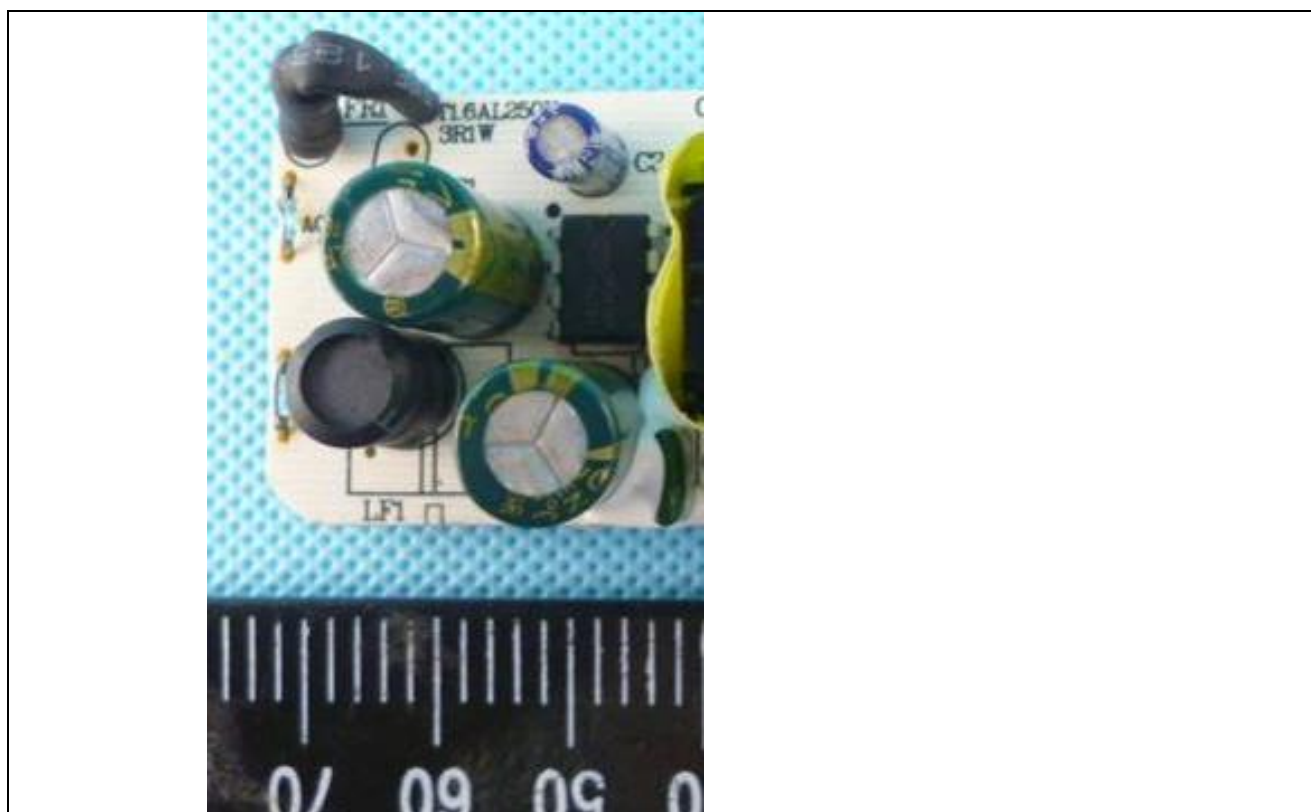


Attachment No. 10

Details of: PCB view(PCB with LF1, CY1, MOV1)

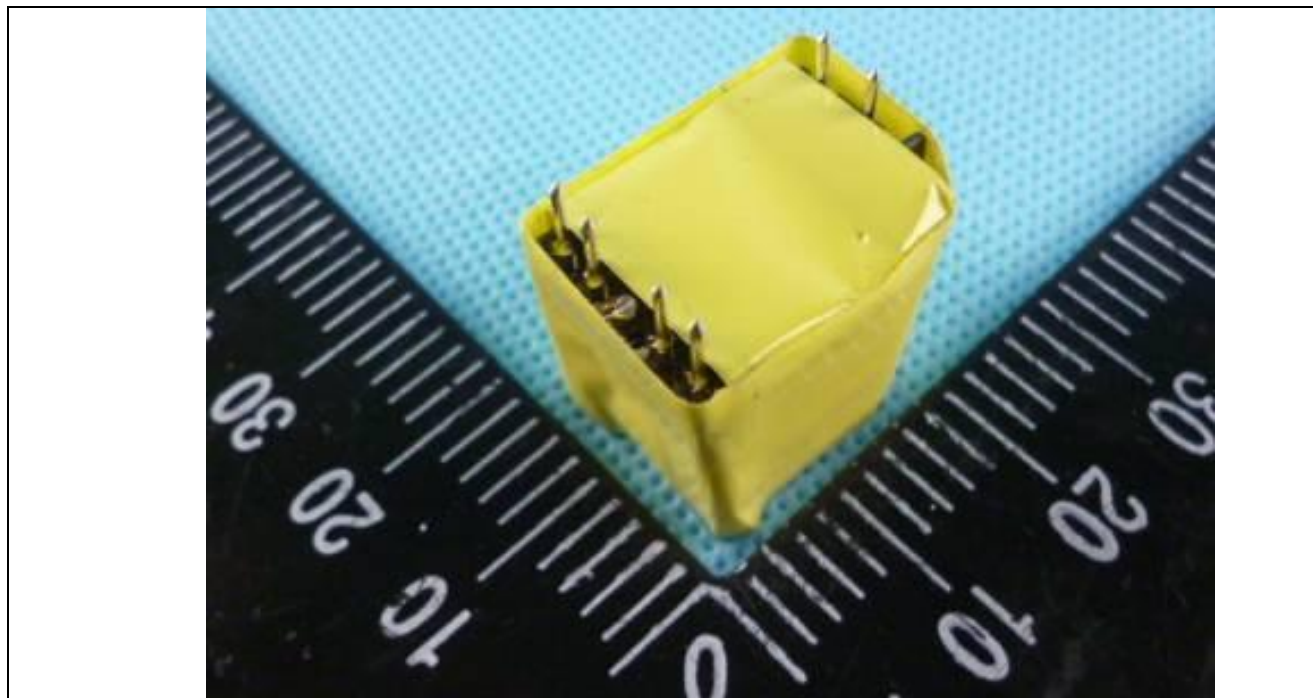


Details of: PCB view(PCB with L1)

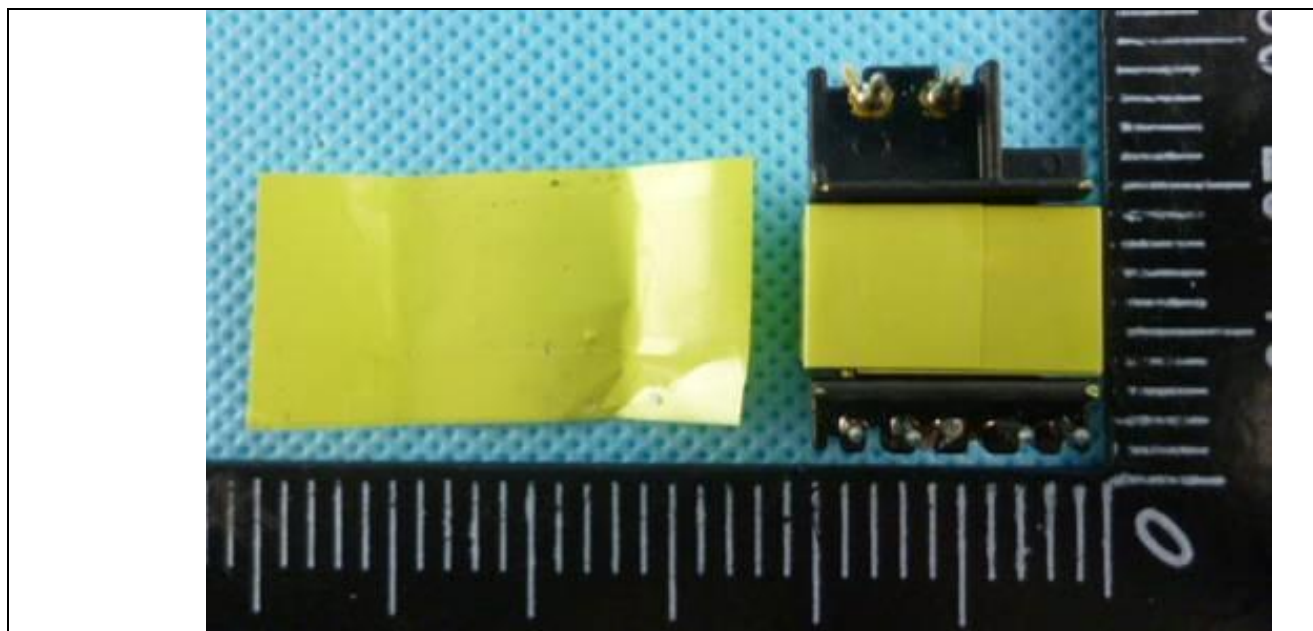


Attachment No. 10

Details of: Transformer(T1) view

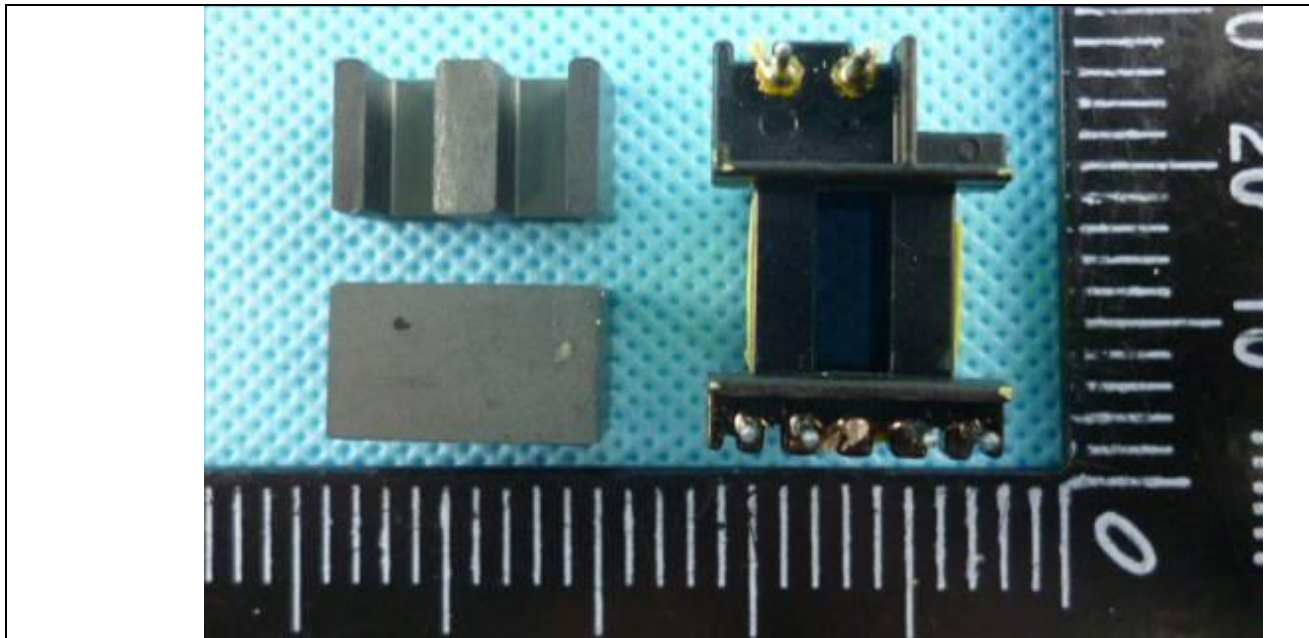


Details of: Transformer(T1) view

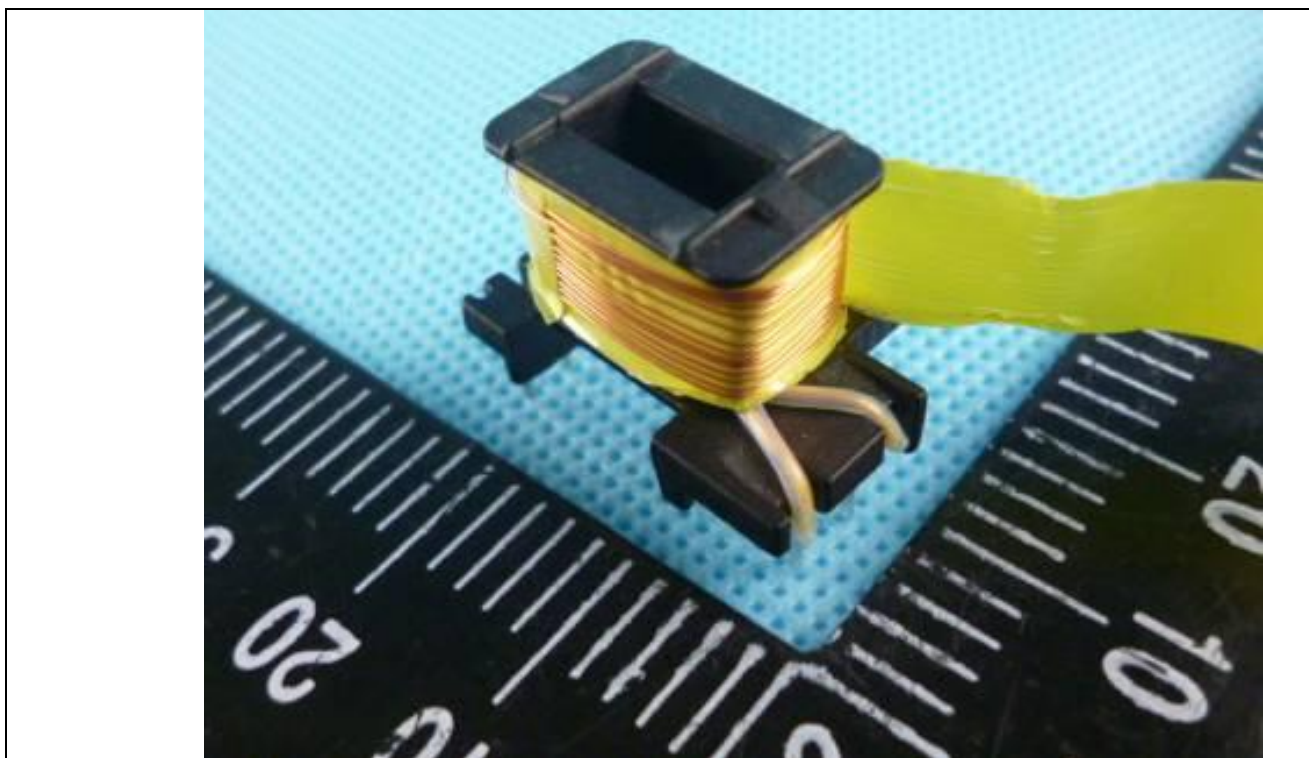


Attachment No. 10

Details of: Transformer(T1) view

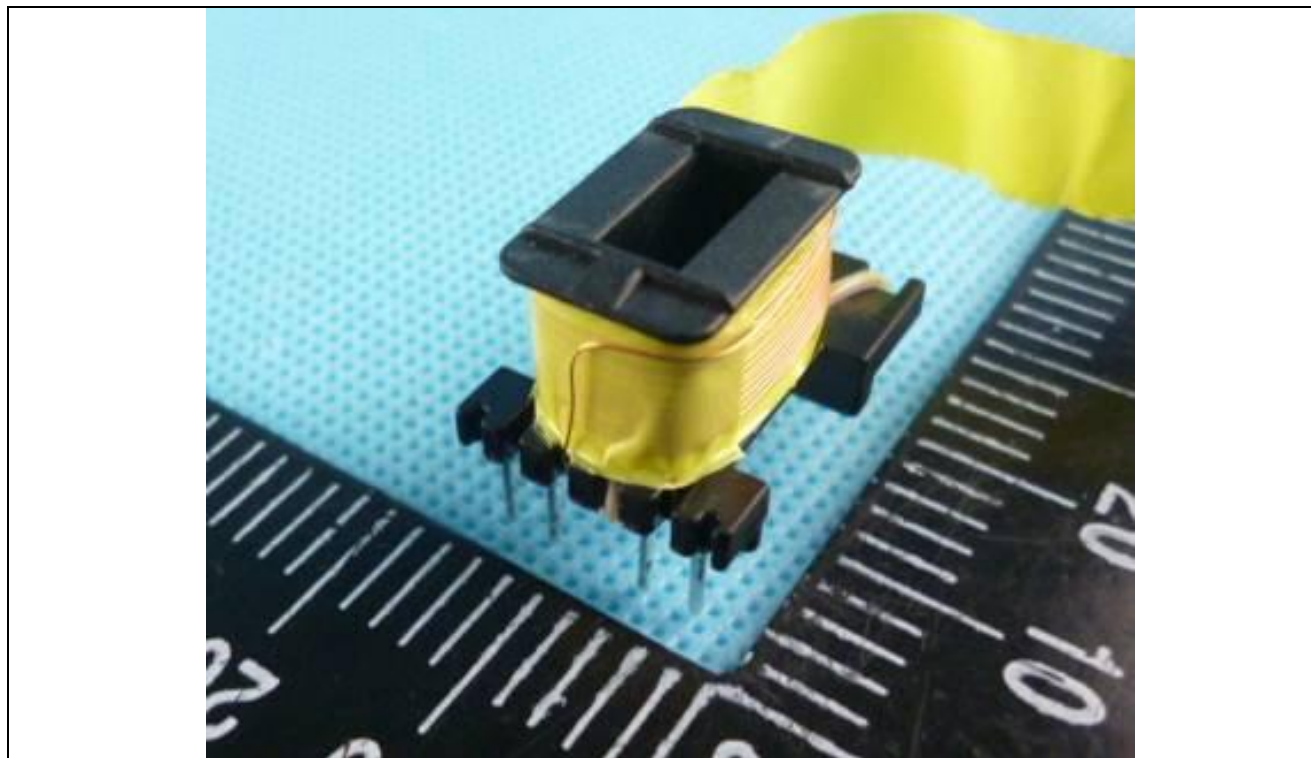


Details of: Transformer(T1) view

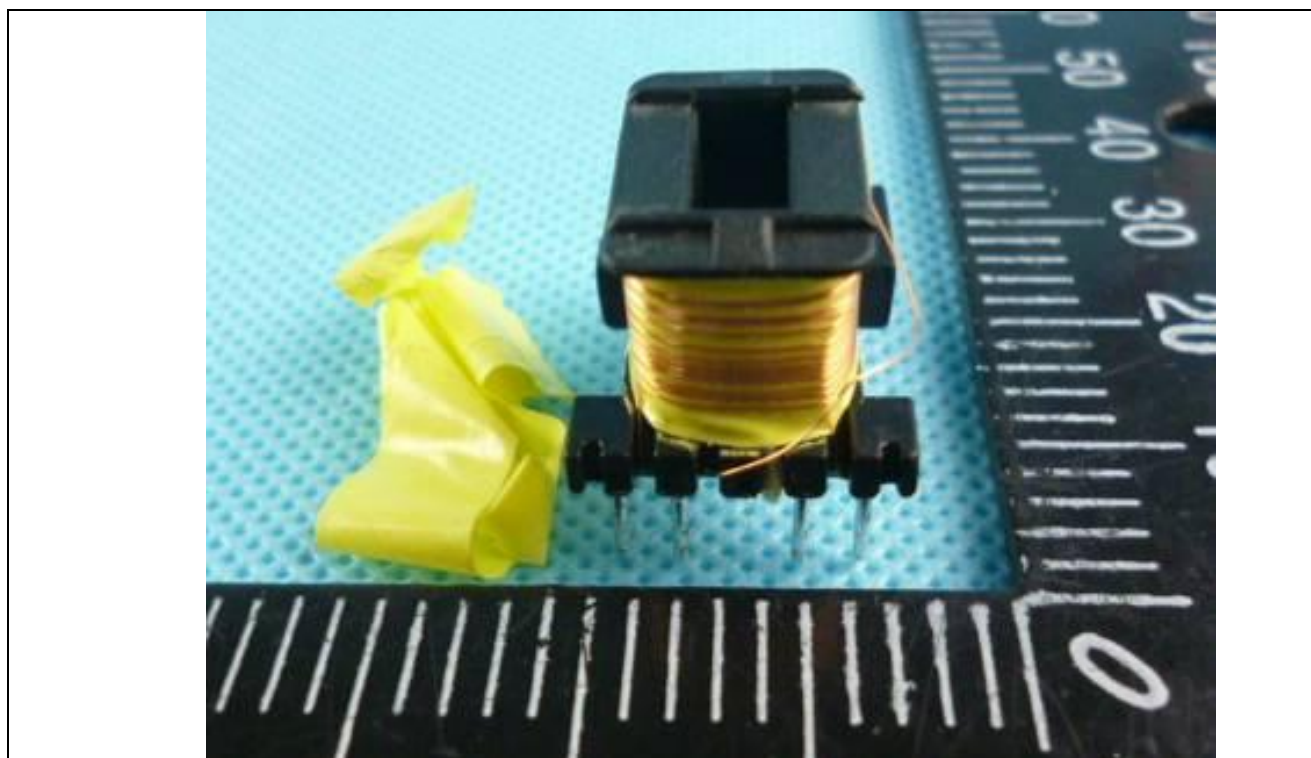


Attachment No. 10

Details of: Transformer(T1) view

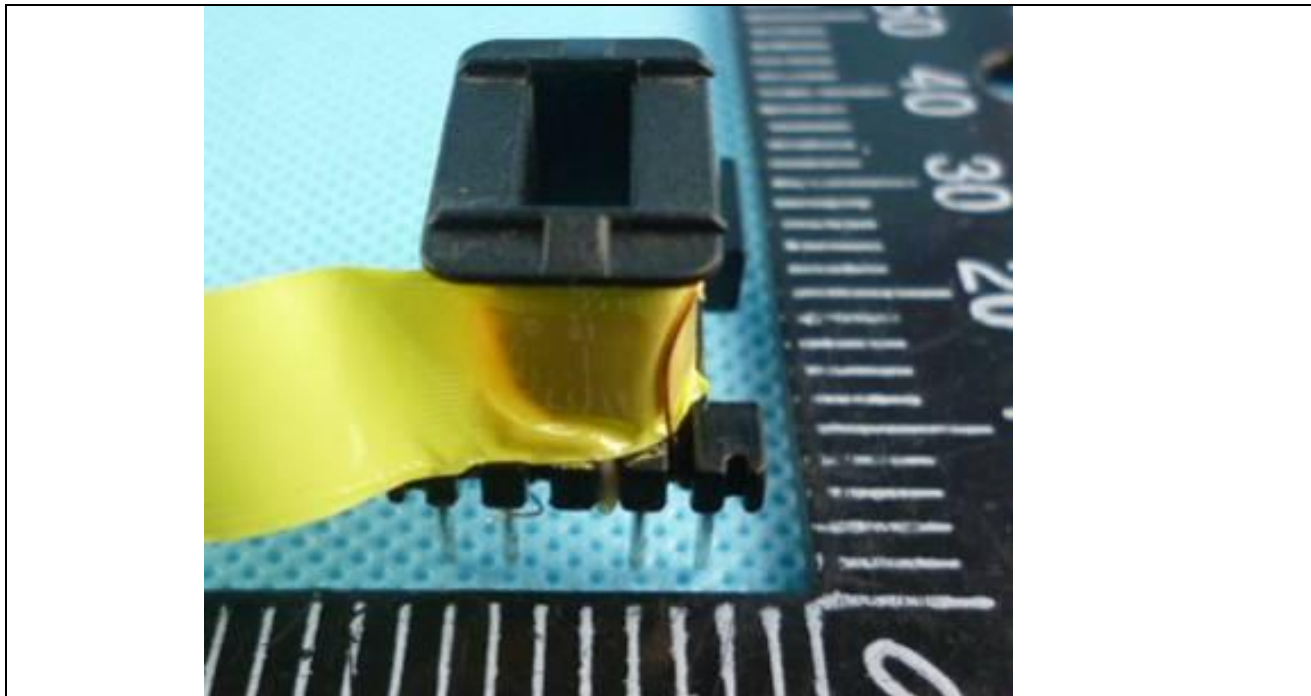


Details of: Transformer(T1) view

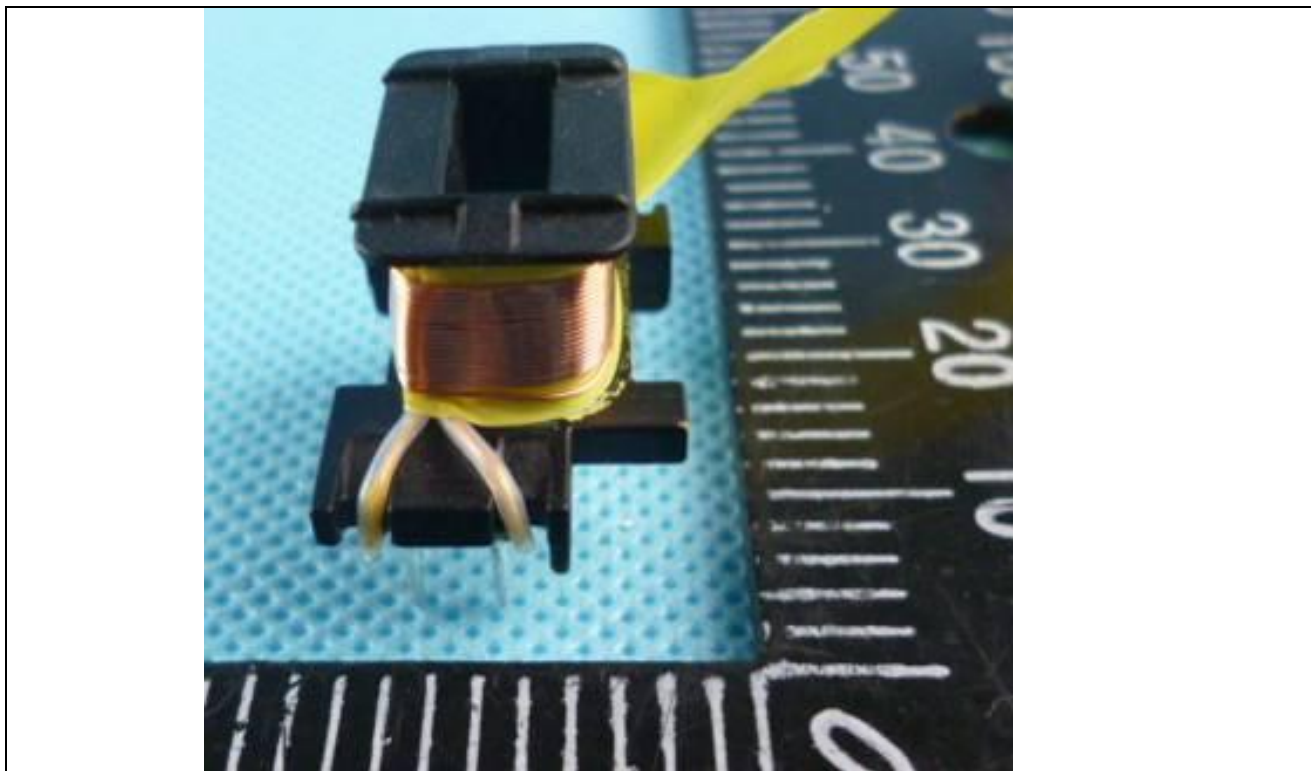


Attachment No. 10

Details of: Transformer(T1) view

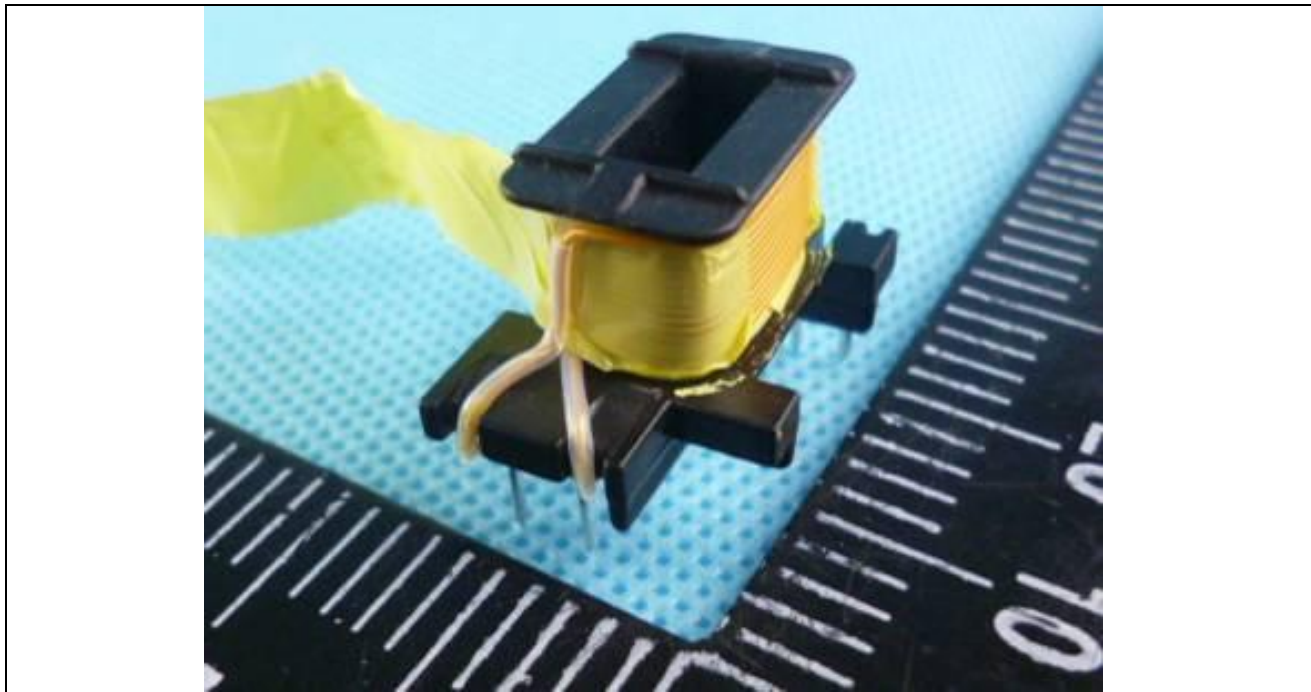


Details of: Transformer(T1) view

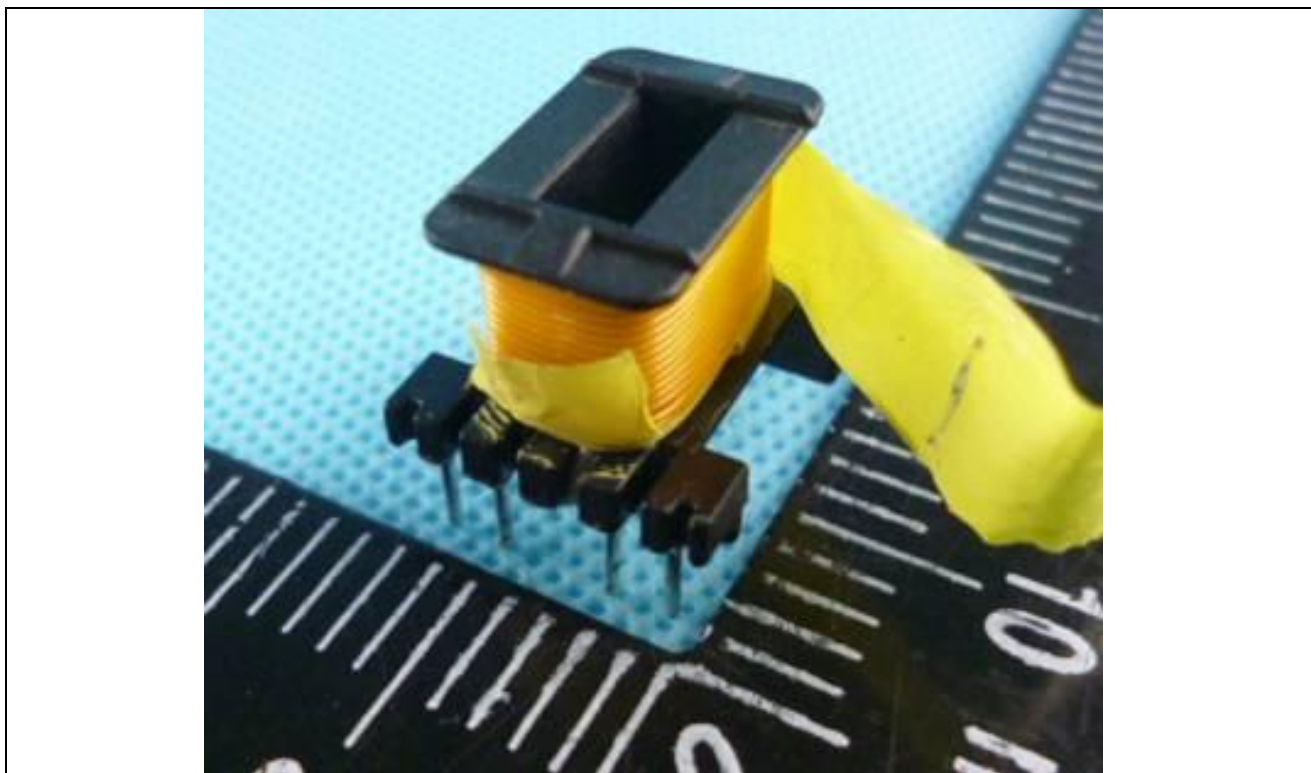


Attachment No. 10

Details of: Transformer(T1) view

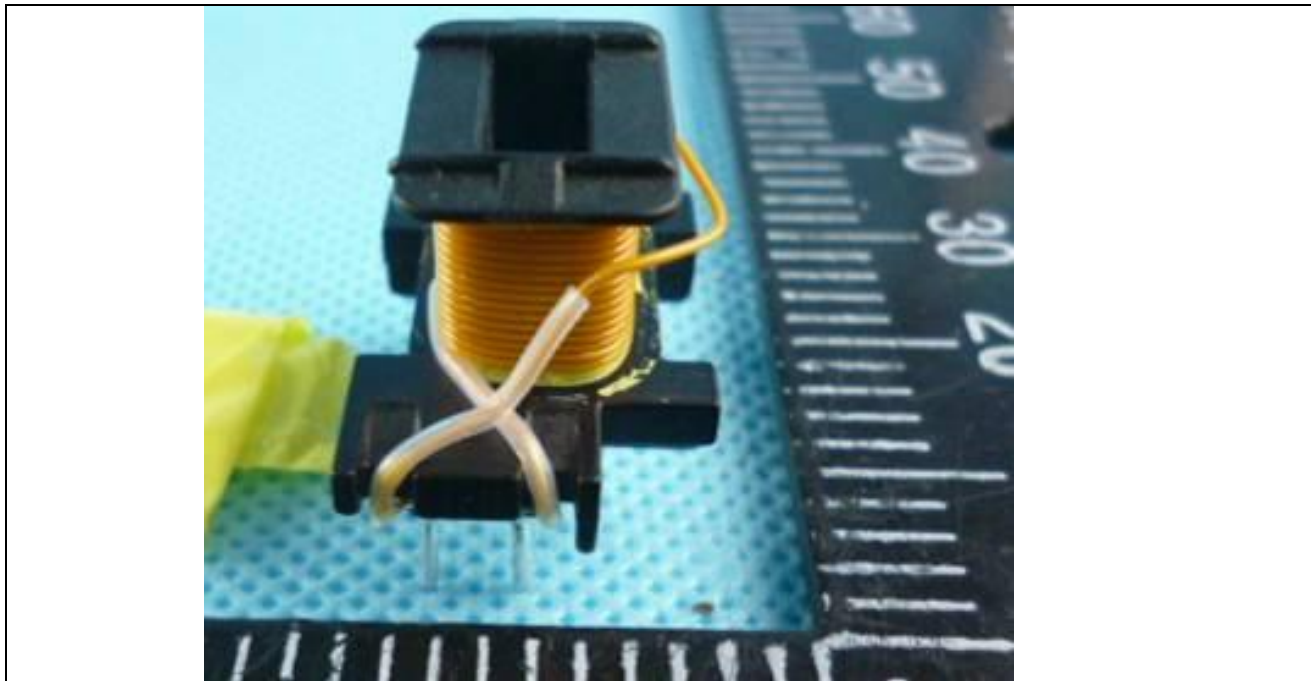


Details of: Transformer(T1) view

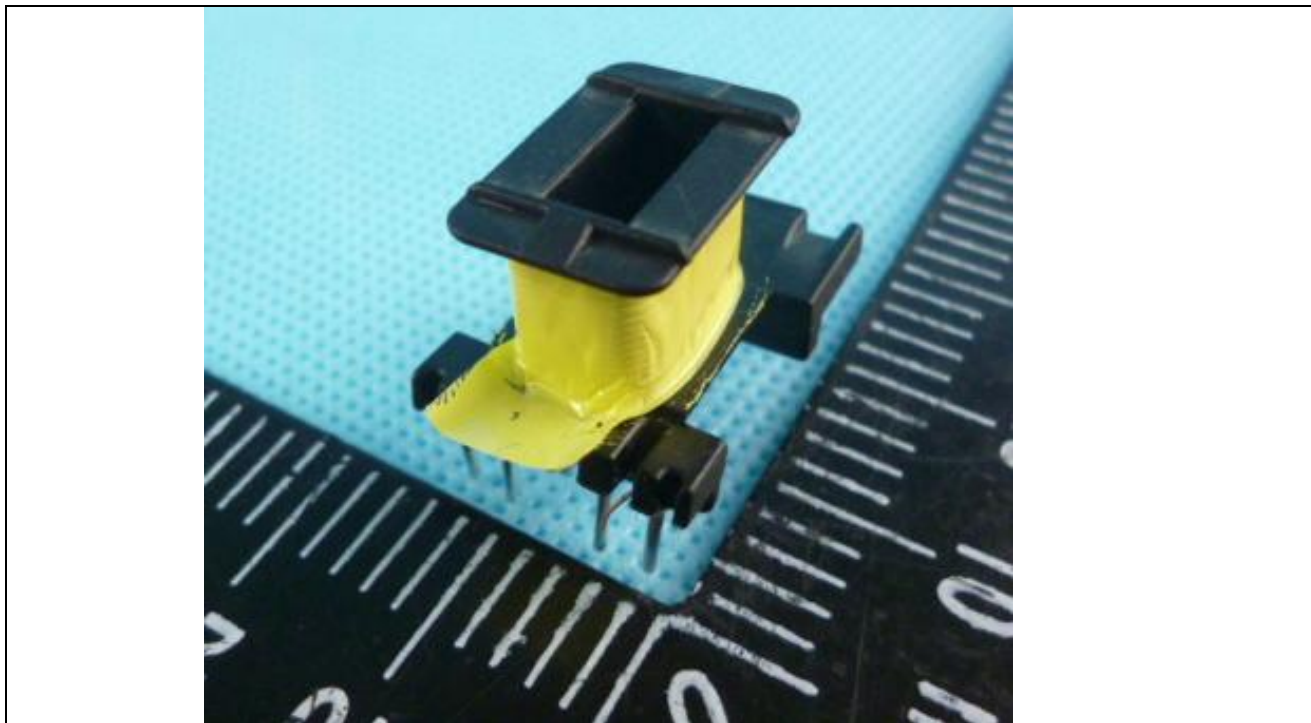


Attachment No. 10

Details of: Transformer(T1) view

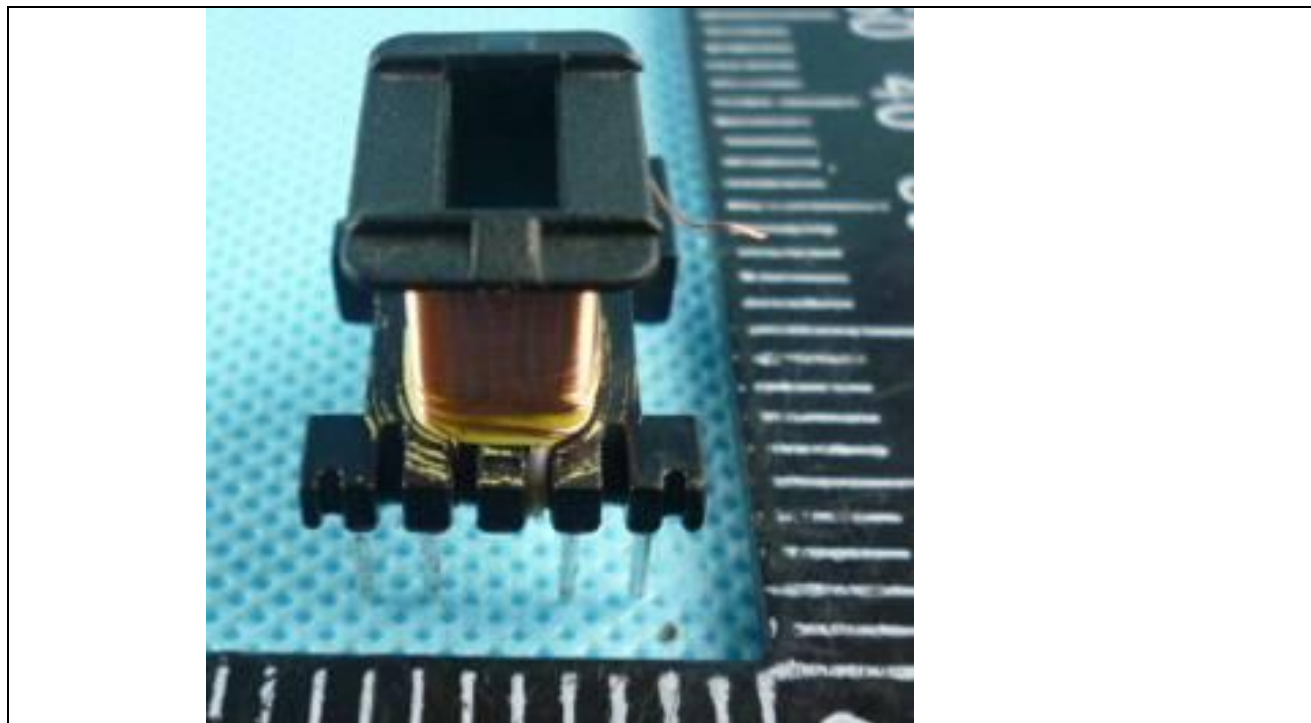


Details of: Transformer(T1) view

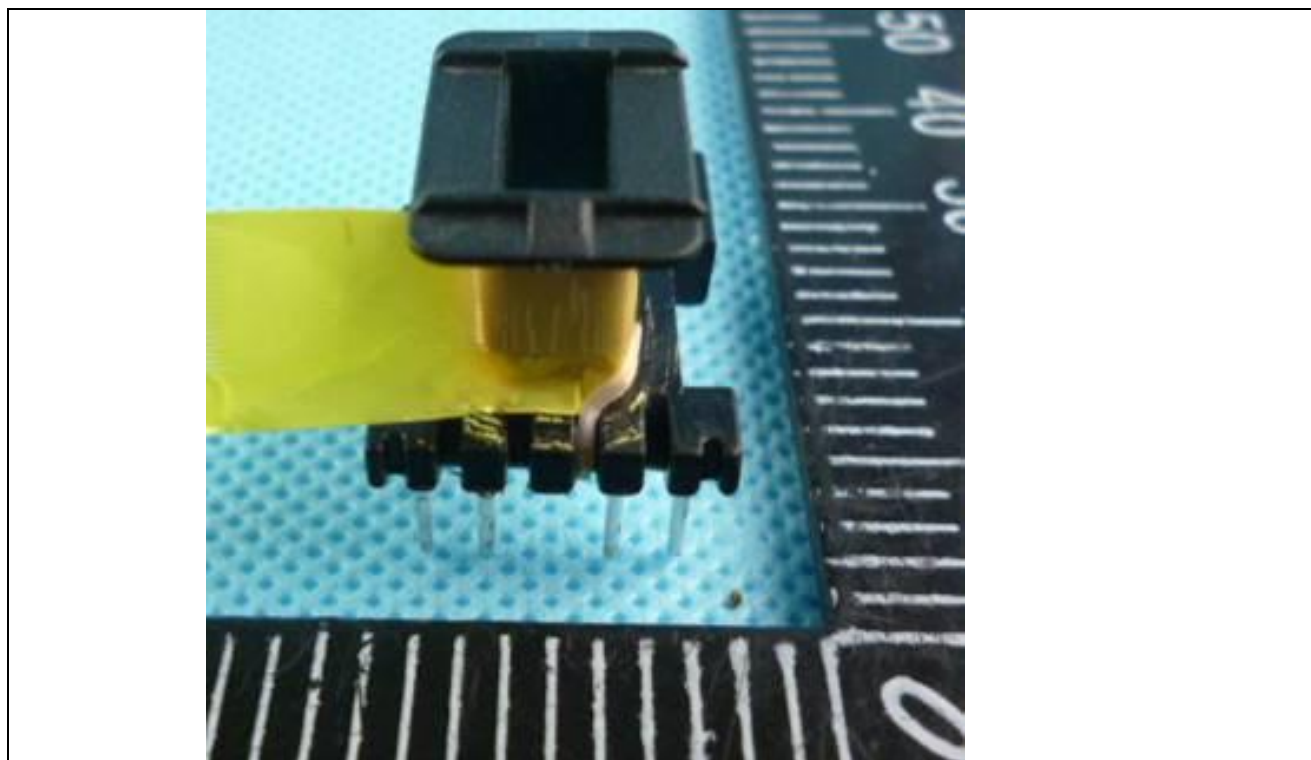


Attachment No. 10

Details of: Transformer(T1) view



Details of: Transformer(T1) view





Attachment No. 2

IEC 60598-1			
Clause	Requirement + Test	Result - Remark	Verdict
0	GENERAL TEST REQUIREMENTS		—
0.1	Information for luminaire design considered	Yes ☒ No ☐	—
0.3	More sections applicable.....	Yes ☐ No ☒	—
2	CLASSIFICATION		—
2.2	Type of protection (Class 0 excluded).....	Class II	—
2.3	Degree of protection (Requirement: Ordinary)	IP20	—
2.4	Luminaire suitable for direct mounting on normally flammable surfaces	Yes ☒ No ☐	—
	Luminaire not suitable for direct mounting on normally flammable surfaces.....	Yes ☐ No ☒	—
2.5	Luminaire for normal use	Yes ☒ No ☐	—
	Luminaire for rough service	Yes ☐ No ☒	—
3	MARKING		—
3.2	Mandatory markings		P
	Position of the marking		P
	Format of symbols/text		P
3.3	Additional information		P
	Language of instructions	English	P
3.3.1	Combination luminaires		N/A
3.3.2	Nominal frequency in Hz		P
3.3.3	Operating temperature		N/A
3.3.4	Symbol or warning notice		N/A
3.3.5	Wiring diagram		P
3.3.6	Special conditions		N/A
3.3.7	Metal halide lamp luminaire – warning		N/A
3.3.8	Limitation for semi-luminaires		N/A
3.3.9	Power factor and supply current		N/A
3.3.10	Suitability for use indoors		N/A
3.3.11	Luminaires with remote control		N/A
3.3.12	Clip-mounted luminaire – warning		N/A



Attachment No. 2

IEC 60598-1			
Clause	Requirement + Test	Result - Remark	Verdict
3.3.13	Specifications of protective shields		N/A
3.3.14	Symbol for nature of supply		P
3.3.15	Rated current of socket outlet		N/A
3.3.16	Rough service luminaire		N/A
3.3.17	Mounting instruction for type Y, type Z and some type X attachments		N/A
3.3.18	Non-ordinary luminaires with PVC cable		N/A
3.3.19	Protective conductor current in instruction if applicable		N/A
3.3.20	Provided with information if not intended to be mounted within arms reach		N/A
3.4	Test with water		P
	Test with hexane		P
	Legible after test		P
	Label attached		P

4	CONSTRUCTION		—
4.2	Components replaceable without difficulty		N/A
4.3	Wireways smooth and free from sharp edges		P
4.4	Lampholders		N/A
4.4.1	Integral lampholder		N/A
4.4.2	Wiring connection		N/A
4.4.3	Lampholder for end-to-end mounting		N/A
4.4.4	Positioning		N/A
	- pressure test (N)		N/A
	After test the lampholder comply with relevant standard sheets and show no damage		N/A
	After test on single-capped lampholder the lampholder have not moved from its position and show no permanent deformation		N/A
	- bending test (N)		N/A
	After test the lampholder have not moved from its position and show no permanent deformation		N/A
4.4.5	Peak pulse voltage		N/A



Attachment No. 2

IEC 60598-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.4.6	Centre contact		N/A
4.4.7	Parts in rough service luminaires resistant to tracking		N/A
4.4.8	Lamp connectors		N/A
4.4.9	Caps and bases correctly used		N/A
4.5	Starter holders		N/A
	Starter holder in luminaires other than class II		N/A
	Starter holder class II construction		N/A
4.6	Terminal blocks		N/A
	Tails		N/A
	Unsecured blocks		N/A
4.7	Terminals and supply connections		N/A
4.7.1	Contact to metal parts		N/A
4.7.2	Test 8 mm live conductor		N/A
	Test 8 mm earth conductor		N/A
4.7.3	Terminals for supply conductors		N/A
4.7.3.1	Welded connections:		N/A
	- stranded or solid conductor		N/A
	- spot welding		N/A
	- welding between wires		N/A
	- Type Z attachment		N/A
	- mechanical test according to 15.8.2		N/A
	- electrical test according to 15.9		N/A
	- heat test according to 15.9.2.3 and 15.9.2.4		N/A
4.7.4	Terminals other than supply connection		N/A
4.7.5	Heat-resistant wiring/sleeves		N/A
4.7.6	Multi-pole plug		N/A
	- test at 30 N		N/A
4.8	Switches:		N/A
	- adequate rating		N/A
	- adequate fixing		N/A
	- polarized supply		N/A



Attachment No. 2

IEC 60598-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- compliance with 61058-1 for electronic switches		N/A
4.9	Insulating lining and sleeves		N/A
4.9.1	Retainment		N/A
	Method of fixing.....:		N/A
	Insulated linings and sleeves		N/A
	Resistant to a temperature > 20 °C to the wire temperature or		N/A
	a) & c) Insulation resistance and electric strength		N/A
	b) Ageing test. Temperature (°C).....:		N/A
4.10	Insulation of Class II luminaires		P
4.10.1	No contact, mounting surface – accessible metal parts – wiring of basic insulation		P
	Safe installation fixed luminaires		N/A
	Capacitors and switches		N/A
	Interference suppression capacitors according to IEC 60384-14		P
4.10.2	Assembly gaps:		N/A
	- not coincidental		N/A
	- no straight access with test probe		N/A
4.10.3	Retainment of insulation:		P
	- fixed		N/A
	- unable to be replaced; luminaire inoperative		P
	- sleeves retained in position		N/A
	- lining in lampholder		N/A
4.11	Electrical connections		P
4.11.1	Contact pressure		N/A
4.11.2	Screws:		N/A
	- self-tapping screws		N/A
	- thread-cutting screws		N/A
4.11.3	Screw locking:		N/A
	- spring washer		N/A
	- rivets		N/A
4.11.4	Material of current-carrying parts		P



Attachment No. 2

IEC 60598-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.11.5	No contact to wood or mounting surface		P
4.11.6	Electro-mechanical contact systems		N/A
4.12	Mechanical connections and glands		N/A
4.12.1	Screws not made of soft metal		N/A
	Screws of insulating material		N/A
	Torque test: torque (Nm); part		N/A
	Torque test: torque (Nm); part		N/A
4.12.2	Screws with diameter < 3 mm screwed into metal		N/A
4.12.4	Locked connections:		N/A
	- fixed arms; torque (Nm)		N/A
	- lampholder; torque (Nm)		N/A
	- push-button switches; torque 0,8 Nm		N/A
4.12.5	Screwed glands; force (Nm)		N/A
4.13	Mechanical strength		P
4.13.1	Impact tests:		P
	- fragile parts; energy (Nm)		N/A
	- other parts; energy (Nm)	Enclosure: 0.5Nm	P
	1) live parts		P
	2) linings		N/A
	3) protection		P
	4) covers		P
4.13.3	Straight test finger		N/A
4.13.4	Rough service luminaires		N/A
	- IP54 or higher		N/A
	a) fixed		N/A
	b) hand-held		N/A
	c) delivered with a stand		N/A
	d) for temporary installations and suitable for mounting on a stand		N/A
4.13.6	Tumbling barrel		P
4.14	Suspensions and adjusting devices		N/A
4.14.1	Mechanical load:		N/A



Attachment No. 2

IEC 60598-1			
Clause	Requirement + Test	Result - Remark	Verdict
	A) four times the weight		N/A
	B) torque 2,5 Nm		N/A
	C) bracket arm; bending moment (Nm)		N/A
	D) load track-mounted luminaires		N/A
	E) clip-mounted luminaires, glass-shelve. Thickness (mm)		N/A
	Metal rod. diameter (mm)		N/A
	Fixed luminaire or independent control gear without fixing devices		N/A
4.14.2	Load to flexible cables		N/A
	Mass (kg)		N/A
	Stress in conductors (N/mm ²)		N/A
	Mass (kg) of semi-luminaire		N/A
	Bending moment (Nm) of semi-luminaire		N/A
4.14.3	Adjusting devices:		N/A
	- flexing test; number of cycles		N/A
	- strands broken		N/A
	- electric strength test afterwards		N/A
4.14.4	Telescopic tubes: cords not fixed to tube; no strain on conductors		N/A
4.14.5	Guide pulleys		N/A
4.14.6	Strain on socket-outlets		N/A
4.15	Flammable materials:		N/A
	- glow-wire test 650 °C		N/A
	- spacing $\geq$ 30 mm		N/A
	- screen withstanding test of 13.3.1		N/A
	- screen dimensions		N/A
	- no fiercely burning material		N/A
	- thermal protection		N/A
	- electronic circuits exempted	Electronic lamp controlgear is exempted from this requirement	N/A
4.15.2	Luminaires made of thermoplastic material with lamp control gear		N/A
	a) construction		N/A



Attachment No. 2

IEC 60598-1			
Clause	Requirement + Test	Result - Remark	Verdict
	b) temperature sensing control		N/A
	c) surface temperature		N/A
4.16	Luminaires for mounting on normally flammable surfaces		N/A
	No lamp control gear	Electronic lamp controlgear is exempted from this requirement	N/A
4.16.1	Lamp control gear spacing:		N/A
	- spacing 35 mm		N/A
	- spacing 10 mm		N/A
4.16.2	Thermal protection:		N/A
	- in lamp control gear		N/A
	- external		N/A
	- fixed position		N/A
	- temperature marked lamp control gear		N/A
4.16.3	Design to satisfy the test of 12.6		N/A
4.17	Drain holes		N/A
	Clearance at least 5 mm		N/A
4.18	Resistance to corrosion:		N/A
4.18.1	- rust-resistance		N/A
4.18.2	- season cracking in copper		N/A
4.18.3	- corrosion of aluminium		N/A
4.19	Igniters compatible with ballast		N/A
4.20	Rough service vibration		N/A
4.21	Protective shield:		N/A
4.21.1	Shield fitted		N/A
	Shield of glass if tungsten halogen lamps		N/A
4.21.2	Particles from a shattering lamp not impair safety		N/A
4.21.3	No direct path		N/A
4.21.4	Impact test on shield		N/A
	Glow-wire test on lamp compartment		N/A
4.22	Attachments to lamps		N/A
4.23	Semi-luminaires comply Class II		N/A



Attachment No. 2

IEC 60598-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.24	UV radiation for tungsten halogen lamps and metal halide lamps (Annex P)		N/A
4.25	No sharp point or edges		P
4.26	Short-circuit protection:		N/A
4.26.1	Uninsulated accessible SELV parts		N/A
4.26.2	Short-circuit test		N/A
4.26.3	Test chain according to Figure 29		N/A
4.27	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N/A
	Pull test of terminal fixing (20 N)		N/A
	After test, resistance < 0,05 Ω		N/A
	Pull test of mechanical connection (50 N)		N/A
	After test, resistance < 0,05 Ω		N/A
	Voltage drop test, resistance < 0,05 Ω		N/A

11	CREEPAGE DISTANCES AND CLEARANCES		—
	Working voltage (V)	—	—
	Voltage form	Sinusoidal ☒ Non-sinusoidal ☐	—
	PTI	< 600 ☒ $\geq$ 600 ☐	—
	Impulse withstand category (Normal category II) (Category III Annex U)	Category II ☒ Category III ☐	—
	Rated pulse voltage (kV).....	--	—
	(1) Current-carrying parts of different polarity: cr (mm); cl (mm).....		N/A
	(2) Current-carrying parts and accessible parts: cr (mm); cl (mm).....		N/A
	(3) Parts becoming live due to breakdown of basic insulation and metal parts: cr (mm); cl (mm).....		N/A
	(4) Outer surface of cable where it is clamped and metal parts: cr (mm); cl (mm).....		N/A
	(5) Not used		—
	(6) Current-carrying parts and supporting surface: cr (mm); cl (mm).....		N/A



Attachment No. 2

IEC 60598-1			
Clause	Requirement + Test	Result - Remark	Verdict

7	PROVISION FOR EARTHING		—
7.2.1 + 7.2.3	Accessible metal parts		N/A
	Metal parts in contact with supporting surface		N/A
	Resistance < 0,5 Ω		N/A
	Self-tapping screws used		N/A
	Thread-forming screws		N/A
	Thread-forming screw used in a grove		N/A
	Earth makes contact first		N/A
7.2.2 + 7.2.3	Earth continuity in joints etc.		N/A
7.2.4	Locking of clamping means		N/A
	Compliance with 4.7.3		N/A
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N/A
7.2.5	Earth terminal integral part of connector socket		N/A
7.2.6	Earth terminal adjacent to mains terminals		N/A
7.2.7	Electrolytic corrosion of the earth terminal		N/A
7.2.8	Material of earth terminal		N/A
	Contact surface bare metal		N/A
7.2.10	Class II luminaire for looping-in		N/A
	Double or reinforced insulation to functional earth		N/A
7.2.11	Earthing core coloured green-yellow		N/A
	Length of earth conductor		N/A

14	SCREW TERMINALS		—
	Separately approved; component list		N/A
	Part of the luminaire		N/A

15	SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS		—
	Separately approved; component list		N/A
	Part of the luminaire		N/A



Attachment No. 2

IEC 60598-1			
Clause	Requirement + Test	Result - Remark	Verdict
5	EXTERNAL AND INTERNAL WIRING		—
5.2	Supply connection and external wiring		P
5.2.1	Means of connection.....:		P
5.2.2	Type of cable: (see Annex 1)		P
	Nominal cross-sectional area (mm ²).....:	See "General product information" for details	P
	Cables equal to HD21 S2 or HD22 S2		N/A
5.2.3	Type of attachment, X, Y or Z	Type Z for output cord	P
5.2.5	Type Z not connected to screws		N/A
5.2.6	Cable entries:		P
	- suitable for introduction		P
	- adequate degree of protection		P
5.2.7	Cable entries through rigid material have rounded edges		P
5.2.8	Insulating bushings:		P
	- suitably fixed		P
	- material in bushings		P
	- material not likely to deteriorate		P
	- tubes or guards made of insulating material		P
5.2.9	Locking of screwed bushings		N/A
5.2.10	Cord anchorage:		P
	- covering protected from abrasion		P
	- clear how to be effective		P
	- no mechanical or thermal stress		P
	- no tying of cables into knots etc.		P
	- insulating material or lining		P
5.2.10.1	Cord anchorage for type X attachment:		N/A
	a) at least one part fixed		N/A
	b) types of cable		N/A
	c) no damaging of the cable		N/A
	d) whole cable can be mounted		N/A
	e) no touching of clamping screws		N/A



Attachment No. 2

IEC 60598-1			
Clause	Requirement + Test	Result - Remark	Verdict
	f) metal screw not directly on cable		N/A
	g) replacement without special tool		N/A
	Glands not used as anchorage		N/A
	Labyrinth type anchorages		N/A
5.2.10.2	Adequate cord anchorage for type Y and type Z attachment		P
5.2.10.3	Tests:		P
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N): 60		P
	- torque test: torque (Nm).....: 0.15		P
	- displacement ≤ 2 mm	0.2mm	P
	- no movement of conductors		P
	- no damage of cable or cord		P
5.2.11	External wiring passing into luminaire		P
5.2.12	Looping-in terminals		N/A
5.2.13	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		P
5.2.14	Mains plug same protection		P
	Class III luminaire plug		N/A
5.2.16	Appliance inlets (IEC 60320)		N/A
	Appliance couplers of class II type		N/A
5.2.17	No standardized interconnecting cables properly assembled		N/A
5.2.18	Used plug in accordance with		N/A
	- IEC 60083		N/A
	- other standard		N/A
5.3	Internal wiring		P
5.3.1	Internal wiring of suitable size and type		N/A
	Through wiring		N/A
	- not delivered/ mounting instruction		N/A
	- factory assembled		N/A
	- socket outlet loaded (A):		N/A



Attachment No. 2

IEC 60598-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- temperatures.....:		N/A
	Green-yellow for earth only		N/A
5.3.1.1	Internal wiring connected directly to fixed wiring		N/A
	Cross-sectional area (mm ²)		N/A
	Insulation thickness		N/A
	Extra insulation added where necessary		N/A
5.3.1.2	Internal wiring connected to fixed wiring via internal current-limiting device		P
	Adequate cross-sectional area and insulation thickness		P
5.3.1.3	Double or reinforced insulation for class II		P
5.3.1.4	Conductors without insulation		N/A
5.3.1.5	SELV current-carrying parts		P
5.3.1.6	Insulation thickness other than PVC or rubber		N/A
5.3.2	Sharp edges etc.		P
	No moving parts of switches etc.		N/A
	Joints, raising/lowering devices		N/A
	Telescopic tubes etc.		N/A
	No twisting over 360°		P
5.3.3	Insulating bushings:		N/A
	- suitable fixed		N/A
	- material in bushings		N/A
	- material not likely to deteriorate		N/A
	- cables with protective sheath		N/A
5.3.4	Joints and junctions effectively insulated		N/A
5.3.5	Strain on internal wiring		P
5.3.6	Wire carriers		N/A
5.3.7	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		P
8	PROTECTION AGAINST ELECTRIC SHOCK		—
8.2.1	Live parts not accessible with standard test finger		P



Attachment No. 2

IEC 60598-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Basic insulated parts not used on the outer surface without appropriate protection		P
	Basic insulated parts not accessible with standard test finger on portable and adjustable luminaires		P
	Basic insulated parts not accessible with Ø 50 mm probe from outside, within arms reach, on wall-mounted luminaires		N/A
	Lampholders and starterholders in portable and adjustable luminaires comply with double or reinforced insulation requirements		N/A
	Basic insulation only accessible under lamp or starter replacement		N/A
	Protection in any position		P
	Double-ended tungsten filament lamp		N/A
	Insulation lacquer not reliable		N/A
	Double-ended high pressure discharge lamp		N/A
	Relevant warning according to 3.2.18 fitted to the luminaire		N/A
8.2.2	Portable luminaire adjusted in most unfavourable position		N/A
8.2.3.a	Class II luminaire:		P
	- basic insulated metal parts not accessible during starter or lamp replacement		N/A
	- basic insulation not accessible other than during starter or lamp replacement		P
	- glass protective shields not used as supplementary insulation		N/A
8.2.3.b	BC lampholder of metal in class I luminaires shall be earthed		N/A
8.2.3.c	Class III luminaires with exposed SELV parts:		N/A
	Ordinary luminaire:		N/A
	- touch current		N/A
	- no-load voltage		N/A
	Other than ordinary luminaire:		N/A
	- nominal voltage		N/A
8.2.4	Portable luminaire:		N/A
	- protection independent of supporting surface		N/A



Attachment No. 2

IEC 60598-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- terminal block completely covered		N/A
8.2.5	Compliance with the standard test finger or relevant probe		P
8.2.6	Covers reliably secured		P
8.2.7	Discharging of capacitors $\geq 0,5 \mu\text{F}$		N/A
	Portable plug connected luminaire with capacitor		P
	Other plug connected luminaire with capacitor		N/A
	Discharge device on or within capacitor		N/A
	Discharge device mounted separately		N/A

9	RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE		—
9.2	Tests for ingress of dust, solid objects and moisture:		P
	- classification according to IP: IP20		—
	- mounting position during test.....: As in normal use		—
	- fixing screws tightened; torque (Nm):		—
	- tests according to clauses: Clause 9.2.0		—
	- electric strength test afterwards		N/A
	a) no deposit in dust-proof luminaire		N/A
	b) no talcum in dust-tight luminaire		N/A
	c) no trace of water on current-carrying parts or SELV parts or where it could become a hazard		N/A
	d) i) For luminaires without drain holes – no water entry		N/A
	d) ii) For luminaires with drain holes – no hazardous water entry		N/A
	e) no water in watertight luminaire		N/A
	f) no contact with live parts (IP 2X)		P
	f) no entry into enclosure (IP 3X and IP 4X)		N/A
	f) no contact with live parts (IP3X and IP4X)		N/A
	g) no trace of water on part of lamp requiring protection from splashing water		N/A
	h) no damage of protective shield or glass envelope		N/A
9.3	Humidity test 48 h	25°C; 93%R.H.	P



Attachment No. 2

IEC 60598-1			
Clause	Requirement + Test	Result - Remark	Verdict

10	INSULATION RESISTANCE AND ELECTRIC STRENGTH		—
10.2.1	Insulation resistance test		N/A
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø		—
	Insulation resistance (MΩ)	See clause 11 of IEC 61347-2-13	—
	SELV:		N/A
	- between current-carrying parts of different polarity.....		N/A
	- between current-carrying parts and mounting surface		N/A
	- between current-carrying parts and metal parts of the luminaire		N/A
	Other than SELV:		N/A
	- between live parts of different polarity		N/A
	- between live parts and mounting surface		N/A
	- between live parts and metal parts		N/A
	- between live parts of different polarity through action of a switch		N/A
10.2.2	Electric strength test		N/A
	Dummy lamp		N/A
	Luminaires with ignitors after 24 h test		N/A
	Luminaires with manual ignitors		N/A
	Test voltage (V):	See clause 12 of IEC 61347-2-13	—
	SELV:		N/A
	- between current-carrying parts of different polarity.....		N/A
	- between current-carrying parts and mounting surface		N/A
	- between current-carrying parts and metal parts of the luminaire		N/A
	Other than SELV:		N/A
	- between live parts of different polarity		N/A
	- between live parts and mounting surface		N/A



Attachment No. 2

IEC 60598-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- between live parts and metal parts		N/A
	- between live parts of different polarity through action of a switch		N/A
10.3	Touch current (mA)	Touch current: Max. 0.408mA (limit: 0.7mA) (Max. value is recorded)	P

13	RESISTANCE TO HEAT, FIRE AND TRACKING		—
13.2.1	Ball-pressure test:		P
	- part tested; temperature (°C)	See clause 19 of IEC 61347-2-13	P
	- part tested; temperature (°C)		N/A
13.3.1	Needle flame test (10 s):		N/A
	- part tested		N/A
	- part tested		N/A
13.3.2	Glow-wire test (650°C):		P
	- part tested		P
13.4.1	Tracking test: part tested		N/A

	ANNEX 1: components	P
--	----------------------------	---

object/part No.	code	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity
—	—	—	—	—	—	—

Remark: see appended table annex 1 of IEC 61347-2-13 for details

	ANNEX 2: screw terminals (part of the luminaire)	N/A
--	---	-----

(14)	SCREW TERMINALS		—
(14.2)	Type of terminal		—
	Rated current (A)		—
(14.3.2.1)	One or more conductors		N/A
(14.3.2.2)	Special preparation		N/A



Attachment No. 2

IEC 60598-1			
Clause	Requirement + Test	Result - Remark	Verdict
(14.3.2.3)	Terminal size		N/A
	Cross-sectional area (mm ²)		N/A
(14.3.3)	Conductor space (mm)		N/A
(14.4)	Mechanical tests		N/A
(14.4.1)	Minimum distance		N/A
(14.4.2)	Cannot slip out		N/A
(14.4.3)	Special preparation		N/A
(14.4.4)	Nominal diameter of thread (metric ISO thread) ..:		N/A
	External wiring		N/A
	No soft metal		N/A
(14.4.5)	Corrosion		N/A
(14.4.6)	Nominal diameter of thread (mm)		N/A
	Torque (Nm)		N/A
(14.4.7)	Between metal surfaces		N/A
	Lug terminal		N/A
	Mantle terminal		N/A
	Pull test; pull (N)		N/A
(14.4.8)	Without undue damage		N/A

	ANNEX 3: screwless terminals (part of the luminaire)	N/A
--	---	-----

(15)	SCREWLESS TERMINALS	—
(15.2)	Type of terminal	—
	Rated current (A)	—
(15.3.1)	Material	N/A
(15.3.2)	Clamping	N/A
(15.3.3)	Stop	N/A
(15.3.4)	Unprepared conductors	N/A
(15.3.5)	Pressure on insulating material	N/A
(15.3.6)	Clear connection method	N/A
(15.3.7)	Clamping independently	N/A
(15.3.8)	Fixed in position	N/A



Attachment No. 2

IEC 60598-1										
Clause	Requirement + Test					Result - Remark				Verdict
(15.3.10)	Conductor size									N/A
	Type of conductor									N/A
(15.5.1)	Terminals internal wiring									N/A
(15.5.1.1)	Pull test spring-type terminals (4 N, 4 samples).....:									N/A
(15.5.1.2)	Pull test pin or tab terminals (4 N, 4 samples).....:									N/A
	Insertion force not exceeding 50 N									N/A
(15.5.2)	Permanent connections: pull-off test (20 N)									N/A
(15.6)	Electrical tests									N/A
	Voltage drop (mV) after 1 h (4 samples).....:									N/A
	Voltage drop of two inseparable joints									N/A
	Number of cycles									—
	Voltage drop (mV) after 10th alt. 25th cycle (4 samples)									N/A
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples)									N/A
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples)									N/A
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples)									N/A
(15.7)	Terminals external wiring									N/A
	Terminal size and rating									N/A
(15.8.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N)									N/A
	Pull test pin or tab terminals (4 samples); pull (N)									N/A
(15.9)	Contact resistance test									N/A
	Voltage drop (mV) after 1 h									N/A
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)	--	--	--	--	--	--	--	--	--	--
	Voltage drop of two inseparable joints									N/A
	Voltage drop after 10th alt. 25th cycle									N/A
	Max. allowed voltage drop (mV)									—
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)	--	--	--	--	--	--	--	--	--	--



Attachment No. 2

IEC 60598-1										
Clause	Requirement + Test					Result - Remark				Verdict
	Voltage drop after 50th alt. 100th cycle									N/A
	Max. allowed voltage drop (mV) :									—
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)	--	--	--	--	--	--	--	--	--	--
	Continued ageing: voltage drop after 10th alt. 25th cycle									N/A
	Max. allowed voltage drop (mV) :									—
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)	--	--	--	--	--	--	--	--	--	--
	Continued ageing: voltage drop after 50th alt. 100th cycle									N/A
	Max. allowed voltage drop (mV) :									—
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)	--	--	--	--	--	--	--	--	--	--



Attachment No. 2

IEC 60598-1			
Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT IEC 60598-1 EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES

Luminaires
Part 1: General Requirements and Tests

Differences according	EN 60598-1:2008 + A11:2009
Annex Form No	EU_GD_IEC_60598_1
Annex Form Originator	TÜV SÜD
Master Annex Form	2011-01
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	CENELEC COMMON MODIFICATIONS (EN)	—
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3	MARKING	—
3.3.101	Adequate warning on the package	N/A

4	CONSTRUCTION	—
4.11.6	Electro-mechanical contact systems	N/A

5	EXTERNAL AND INTERNAL WIRING	—
5.2.1	Connecting leads	N/A
	- without a means for connection to the supply	N/A
	- terminal block specified	N/A
	- relevant information provided	N/A
	- compliance with 4.6, 4.7.1, 4.7.2, 4.10.1, 11.2, 12 and 13.2 of Part 1	N/A
5.2.2	Cables equal to HD21 S2 or HD22 S2	N/A

12	ENDURANCE TEST AND THERMAL TEST	—
12.4.2c	Thermal test (normal operation)	N/A



Attachment No. 2

IEC 60598-1			
Clause	Requirement + Test	Result - Remark	Verdict
ZB	ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)		—
(3.3)	DK: power supply cord with label		N/A
	IT: warning label on Class 0 luminaire		N/A
(4.5.1)	DK: socket-outlets		N/A
(5.2.1)	CY, DK, FI, SE, GB: type of plug		N/A
ZC	ANNEX ZC, NATIONAL DEVIATIONS (EN)		—
(4 & 5)	FR: Shuttered socket-outlets 10/16A		N/A
(13.3)	FR: Glow-wire test 850°C alt. 750°C for luminaires in premises open to public or 960°C for luminaires in emergency exits		N/A
(13.3)	GB: Requirements according to United Kingdom Building Regulation		N/A



Attachment No. 3

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT IEC 61347-2-13 STANDARD DIFFERENCES BETWEEN IEC/EN 61347-2-13:2006 AND IEC/EN 61347-2-13:2014 Part 2-13: Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules			
Differences according to: IEC 61347-2-13:2006			
Attachment Form No.: SD_IEC61347_2_13E			
Attachment Originator: TÜV SÜD			
Master Attachment: 2015-05			
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16 (-)	ABNORMAL CONDITIONS		—
16.1 (-)	Control gear which are of the constant voltage output type:		P
	a) No LED module inserted	There is no output power while no LED module is connected	P
	b) Double LED modules or equivalent load connected to the output terminals	Protective circuit operated after double number of LED module	P
	c) Output terminal short-circuited (20 cm and 200 cm or declared length)	Protective circuit operated after the output terminal short-circuited	P
	During and at the end of the tests no defect impairing safety, nor any smoke or flammable gases produced		P
16.2 (-)	Control gear which are of the constant current output type		N/A
	a) No LED module connected		N/A
	b) Double the LED modules or equivalent load connected in series to the output terminals		N/A
	c) Output terminal short-circuited (20 cm and 200 cm or declared length)		N/A
	Maximum output voltage not exceeded		N/A
	During and at the end of the tests no defect impairing safety, nor any smoke or flammable gases produced		N/A



Attachment No. 3

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
I	ANNEX I: PARTICULAR ADDITIONAL REQUIREMENTS FOR INDEPENDENT SELV D.C. OR A.C. SUPPLIED ELECTRONIC CONTROLGEAR FOR LED MODULES		—
I.3	Classification		—
I.3.1	Class I	Yes ☐ No ☒	—
	Class II	Yes ☒ No ☐	—
I.3.2	a) non-inherently short circuit proof controlgear	Yes ☒ No ☐	—
	b) non-inherently open circuit proof controlgear	Yes ☐ No ☒	—
	c) inherently short circuit proof controlgear	Yes ☐ No ☒	—
	d) inherently open circuit proof controlgear	Yes ☐ No ☒	—
	e) fail safe controlgear	Yes ☐ No ☒	—
	f) non-short-circuit proof controlgear	Yes ☐ No ☒	—
	g) non-open-circuit proof controlgear	Yes ☐ No ☒	—
I.4	Marking		—
	Adequate symbols are used		P
I.5	Protection against electric shock		—
I.5.1	No connection between output winding and body		P
	No connection between output winding and protective earthing circuit		N/A
I.5.2	Input and output circuits electrically separated from each other		P
I.5.2.1	Insulation between input and output winding of the HF-transformer consists of double or reinforced insulation		P
	Class II: insulation between input/output and body consists of double or reinforced insulation		P
	Class I: insulation between input and body consists of basic and between output and body supplementary insulation		N/A
I.5.2.2	Insulation between input and output winding via the core consists of double or reinforced insulation		P
	Insulation between cord and windings of the HD-transformer consists of basic insulation		N/A
I.5.2.3	Serrated tape, additional layer		N/A



Attachment No. 3

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
1.5.2.4	Class I controlgear for fixed connection provided with basic insulation plus protective screening comply with the following conditions:		N/A
	a) Insulation between the input winding and the protective screen complies with the requirements for basic insulation		N/A
	b) Insulation between the protective screen and the output winding complies with the requirements for basic insulation		N/A
	c) Metal screen consists of a metal foil or of a wire		N/A
	d) Metal screen so arranged that both edges cannot simultaneously touch a magnetic core		N/A
	e) Metal screen and its lead-out wire have a cross-section sufficient to ensure that an overload device will open the circuit before the screen is destroyed		N/A
	f) Lead-out wire sufficiently fixed to the metal screen		N/A
1.5.2.5	Last turn of each winding of the transformer retained by positive means		P
	Impregnated winding		N/A
	Winding held together by means of insulating material		N/A
1.5.3	Components bridging between input and output circuit		P
1.5.3.1	Used capacitors and resistors comply with 8.2		P
1.5.3.2	Used opto-couplers comply with 2.10.5.2 of IEC 60950-1 or 0,4 mm and test in 1.8		N/A
1.6	Heating		—
1.6.1	No excessive temperatures in normal use		P
	Used material classified as Class	Class 130 (B)	—
	Stated value of t_a	(See appended table L.6)	—
1.6.2	Temperature rises (Upri: 1.06 time supply rated voltage)		P



Attachment No. 3

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Determined temperature rises in windings: - Primary (K) - Limit max (K) - Secondary (K) - Limit max (K)	(See appended table L.6)	P
	After the test:		P
	- no connections have worked loose		P
	- no reduction of creepage distances and clearances		P
	- no flow of sealing compound		P
	- no operation of protecting devices		P
	- electric strength test between input and output windings	3750V	P
I.6.3	Cycling test (10 cycles):		N/A
I.6.3.1	- heat run at (K)		N/A
I.6.3.2	- moisture treatment 48 h		N/A
I.6.3.3	- vibration test 1 h; 1,5 g		N/A
I.6.3.4	After the tests:		N/A
	- insulation resistance $\geq 2, 4$ or $5 \text{ M}\Omega$		N/A
	- dielectric strength test for 2 min. at 35 % of specified value in table I.6		N/A
	- Current or the ohmic component does not deviates by more than 30 %		N/A
I.7	Short-circuit and overload protection		—
I.7.1	Upri: 1.06 times rated voltage or 0.94 and 1.06 times rated supply voltage (V)	(See appended table L.7)	P
I.7.2 I.7.3 I.7.4	Determined temperature rise in windings and on other parts:		P
	- test according to Clause	Clause I.7.3	P
	- Primary winding (K)	(See appended table L.7)	P
	- Limit max (K)	(See appended table L.7)	P
	- Secondary winding (K)	(See appended table L.7)	P
	- Limit max (K)	(See appended table L.7)	P



Attachment No. 3

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	- External enclosure ≤ 80 (K)	(See appended table L.7)	P
	- Rubber insulation of wiring ≤ 60 (K)		N/A
	- PVC insulation of wiring ≤ 60 (K)		N/A
	- Supports ≤ 80 (K)	(See appended table L.7)	P
I.7.5	Fail-safe convertors		N/A
I.7.5.1	- Upri: 1.06 times rated supply voltageV:		—
	- Isec: 1.5 times rated output currentA:		—
	- time until steady-state conditions t1 (h)		—
	- time until failure t2 (h): $\leq t1$; ≤ 5 h.....		N/A
I.7.5.2	During the test:		N/A
	- no flames, molten material, etc.		N/A
	- temperature rise of enclosure ≤ 150 K		N/A
	- temperature rise of plywood support ≤ 100 K		N/A
	After the test:		N/A
	- electric strength (test voltage; 35 % of specified value); no flashover or breakdown for primary-to-secondary and for primary-to-body		N/A
	- live parts not accessible by test finger through holes of enclosure		N/A
I.8	Insulation resistance and electric strength		—
I.8.1	Conditioned 48 h between 91 % and 95 %	25°C; 93%R.H.	P
I.8.2	Adequate insulation (500 V d.c. for 1 min) between:		P
	Live parts and the body –for basic insulation not less than 2 M Ω		N/A
	Live parts and the body –for reinforced insulation not less than 4 M Ω	100M Ω	P
	Input- and output circuits not less than 5 M Ω	100M Ω	P
	Metal parts of class II convertors which are separated from live parts by basic insulation only and the body not less than 5 M Ω		N/A
	Metal foil in contact with the inner and outer surfaces of enclosures of insulating material not less than 2 M Ω	100M Ω	P
I.8.3	Electric strength test:		P



Attachment No. 3

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	1) Between live parts of input circuits and live parts of output circuits	3750V	P
	2) Over basic or supplementary insulation between:		P
	a) live parts which are or may become of different polarity	1875V	P
	b) live parts and body if intended to be connected to protective earth		N/A
	c) accessible metal parts and a metal rod of the same diameter as the flexible cable or cord	1875V	P
	d) live parts and an intermediate metal part		N/A
	e) intermediate metal parts and the body		N/A
	3) Over reinforced insulation between the body and live parts	3750V	P
	No flashover or breakdown occurred		P
I.9	Construction		—
I.9.1	Comply with all requirements		P
I.9.2	The distance between input and output terminals shall not be less than 25 mm		P
I.10	Components		—
I.10.1	Socket-outlets in the output circuit does not accept plugs complying with IEC 60083 and IEC 60906-1		N/A
I.10.2	Self-resetting protective devices shall not be used unless it is certain that there will be no hazards		N/A
	Compliance is checked by connecting the convertor for 48 h at 1.06 times the rated voltage with the output short-circuited		N/A
I.11	Creepage distances and clearances		—
	1. Insulation between input and output circuits:		P
	a) measured values $\geq$ specified values (mm) (See appended table I.11)		P
	b) measured values $\geq$ specified values (mm) (See appended table I.11)		P
	c) measured values $\geq$ specified values (mm) (See appended table I.11)		P
	2. Insulation between adjacent <u>input</u> circuits: measured values $\geq$ specified values (mm)		N/A
	2. Insulation between adjacent <u>output</u> circuits: measured values $\geq$ specified values (mm)		N/A



Attachment No. 3

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	3. Insulation between terminals for external connection:		N/A
	a) measured values $\geq$ specified values (mm)		N/A
	b) measured values $\geq$ specified values (mm)		N/A
	c) measured values $\geq$ specified values (mm)		N/A
	4. Basic or supplementary insulation:		P
	a) measured values $\geq$ specified values (mm) (See appended table I.11)		P
	b) measured values $\geq$ specified values (mm)		N/A
	c) measured values $\geq$ specified values (mm)		N/A
	d) measured values $\geq$ specified values (mm)		N/A
	e) measured values $\geq$ specified values (mm)		N/A
	5. Reinforced insulation: measured values $\geq$ specified values (mm) (See appended table I.11)		P
	6. Distance through insulation:		P
	a) measured values $\geq$ specified values (mm)		N/A
	b) measured values $\geq$ specified values (mm)		N/A
	c) measured values $\geq$ specified values (mm)		N/A
	d) measured values $\geq$ specified values (mm)		P

16	TABLE: transformer heating--abnormal condition			P
	Type reference			—
	Lamp used	LED modules		—
	Mounting position	As in normal use		—
	Test voltage	90V and 264V		—
temperature rise(K) of part		Test (K)		Limit(K)
Condition:	16.1 / 16.2 a)	16.1 / 16.2 b)	16.1 / 16.2 c)	—
PCB	—	—	—	—
Transformer (T1) coil, class 130 (B)	—	—	—	—
tc above T1	—	—	—	—
Ambient	—	—	—	—
Remark: 1. Output shutdown immediately for 16.2b) and 16.2c). 2. The temperature rise of components are lower than temperature rise of components at normal heating test, so no temperature rise data are recorded.				



Attachment No. 3

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

I.11	TABLES: Creepage distances and clearances measurement						P
creepage distance Cr. and clearance Cl. at/of:	Up (V)	U rms. (V)	Table I.7	Measured		Required in table L.5	
				Cl. (mm)	Cr. (mm)	Cl. (mm)	Cr. (mm)
Basic Insulation							
Line and Neutral before F1	—	240	4a	5.0	5.0	2.9	2.9
Two terminals of F1	—	240	4a	3.0	3.0	2.9	2.9
Supplementary Insulation							
—	—	240	4c	—	—	2.9	2.9
Reinforced or Double Insulation							
Live parts and outer surface	—	240	5	6.0	6.0	5.8	5.8
CY1 two terminals	—	257	1a	6.5	6.5	5.8	5.8
Pri. Part to sec. part (except T1)	—	257	1a	8.0	8.0	5.8	5.8
Iron core of T1 and sec. components	—	257	1a	6.1	6.1	5.8	5.8
Iron core of T1 and sec. pin of T1	—	257	1a	6.5	6.5	5.8	5.8
DTI (Distance through insulation)							
DTI at/of:	Up (V)	U rms. (V)	Table I.7	Measured		Required in table L.5 DTI (mm)	
				DTI (mm)	Layers of insulating tape		
Supplementary Insulation							
—	—	—	—	—	—	—	
Reinforced insulation							
Tape on outer of T1	—	240	1c	0.2	3	0.1 [output<25VA] 0.2 [25VA≤ output≤100VA] 0.3 [output>100VA]	
Enclosure	—	240	6d	2.0	—	0.8	
Remark:							
1. above limits are considered under normal pollution and PTI < 600 condition.							
2. minimum measured value recorded.							



Attachment No. 4

Deviation for Australia and New Zealand of IEC 61347-1			
Clause	Requirement + Test	Result - Remark	Verdict
Annex ZZ2	Variations		P
5	General notes on tests		P
	For Australia, the rated supply voltage is 230 V/400 V+10%,-6% and for testing according to this standard, the rated test voltage shall be 240 V/415 V.		P
7.1	- the marking of the rated voltage, or rated voltage range. It shall cover 240 V for Australia and 230 V for New Zealand.	See test report	P
9 (8)	Terminals, cables and cords		N/A
	Screw terminals shall comply with Section 14 of AS/NZS 60598.1 Screwless terminals shall comply with Section 15 of AS/NZS 60598.1 Cables and cords shall comply with the relevant requirements of Section 5 of AS/NZS 60598.1		N/A
20 (18)	Resistance to heat, fire and tracking		P
(18.2.1)	Glow-wire test (750°C):		P
	- part tested : Enclosure		P
(18. 2.2)	Glow-wire test (650°C):		N/A
	- part tested :		N/A
(18.2.3)	Needle flame test (10 s):		P
	- part tested : Transformer bobbin, plug holder		P



Attachment No. 5

According to AS/NZS IEC 61347.2.13:2013 compared to IEC 61347-2-13:2006

AS/NZS IEC 61347.2.13:2013			
Clause	Requirement - Test	Result - Remarks	Verdict
ZZ	Appendix ZZ: Variations to IEC 61347-2-13:2006 for Australia and New Zealand		—
4	GENERAL REQUIREMENTS		—
	Where the control gear has accessible outputs, the control gear shall be - SELV outputs, and - comply with Annex I		P
	SELV equivalent is not permitted, where		N/A
	Control gear has accessible outputs		N/A
	Control gear is classified as independent SELV		P
8	PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS		—
8.2	Output circuits of SELV control gear with accessible outputs		N/A
	Output voltage under load ≤ 25 V r.m.s. or ≤ 60 V d.c.		N/A
	If output voltage > 25 V r.m.s. or > 60 V d.c.		P
	a) touch current does not exceed 0,7 mA (peak) or 2 mA d.c. :	See main report	P
	b) the no load output shall not exceed $33\sqrt{2}$ V peak or 60 V d.c.		N/A
	The requirements are applicable for each of the rated supply voltages.		N/A
	Control gear with an output greater than the limits above shall have insulated terminals.		N/A
	The touch current is checked by measurement in accordance with Annex G of IEC 60598-1		P
	Double or reinforced insulation bridged by appropriate and at least two resistors or two Y2 capacitors or one Y1 capacitor		P
	Y1 or Y2 capacitors comply with IEC 60384-14		P
	Resistors comply with test (a) in 14.1 of IEC 60065		N/A
9	TERMINALS		—
9.1	Direct plug-in control gear		P
	Plug-in control gear with pins for direct insertion into a socket-outlet shall comply with Appendix J of AS/NZS 3112:2011.		P
16	ABNORMAL CONDITIONS		—



Attachment No. 5

AS/NZS IEC 61347.2.13:2013

Clause	Requirement - Test	Result - Remarks	Verdict
16.2	Control gear which are of the constant current output type		N/A
	d) For control gear with SELV output, the LED modules, or equivalent load for which the control gear is designed, shall continue to be connected in series incrementally to the output terminals until the control gear ceases to operate or the output voltage is stabilized.		N/A
	During the tests under d), the maximum voltage measured on the output terminal shall not exceed the SELV limits of clause 8.		N/A

Attachment No. 6

EN 50075			
Clause	Requirement + Test	Result - Remark	Verdict

For European plug (EN 50075:1990):

7	DIMENSIONS		P
	Dimension of plug shall comply with standard sheet1	(See appended table)	P
8	PROTECTION AGAINST ELECTRIC SHOCK		--
8.1	Live parts of the plugs, with the exception of the bare metal pins, should not be accessible(75N, 60 second in 35°C ambient)		P
8.2	It should not be possible to make connection between a pin of a plug and live socket contact of a socket while the other pin is accessible		P
8.3	External parts of plug made of insulating material		P
9	CONSTRUCTION		--
9.1	Plugs are not rewirable		P
9.2	Switches, fuse, lampholder shall not be incorporated in plugs		P
9.3	Pins of shall have adequate mechanical strength to withstand the stress imposed during use		P
9.4	Pins of plugs shall be locked against rotation and adequately fixed into body of the plug		P
9.6	Plug shall be shaped in such a way and made of such material that they can easily be withdrawn by hand from the socket outlet		P
10	Resistance to humidity		P
11	Insulation resistance and electric strength		P
11.1	Insulation resistance (500V, min 5MΩ)	200MΩ	P
11.2	Electric strength (2000V)		P
13	MECHANICAL STRENGTH		--
13.1	Compression test (150 N, 5 min)		P
13.2	Tumbling barrel test for adaptor After test, the pin shall not turn when a torque of 0.4 Nm is applied, first in one direction for 1 min and then in the opposite direction for 1 min.	1000 falls. EK1 557-13 considered.	P
13.3	Abrasion test on the insulating sleeves	20000 movements: no damage	P
13.4	Pin shall not have displaced in body of the plug more than 1mm		P
14	Resistance to heat and to aging		P
14.1	Sufficient resistant to heat	Incorporated with adaptor.	P
14.1.1	After 1 h in heating cabinet at 100°C no damage shown	Tested with adaptor.	P

Attachment No. 6

EN 50075			
Clause	Requirement + Test	Result - Remark	Verdict
14.1.2	After 1 h in heating cabinet at 80°C and a force of 20N through the jaws no damage shown		P
14.2	Aging test		P
	-at 70°C for 168h		P
	-at room temperature for 96h		P
	No traces of cloth at a force of 5N		P
	No damage leads to non-compliance		P
15	CURRENT-CARRYING PARTS AND CONNECTIONS		--
15.1	Connections withstand the mechanical stresses occurring in normal use		P
15.2	Electric connection shall be so designed that contact pressure is not transmitted through insulation		P
15.3	Current-carrying parts		P
	Copper		P
	Alloy containing at least 58% of copper equivalent		P
16	Creepage distances, clearances and distances through insulation		P
	Live parts of different polarity: 3mm	>5.0 mm	P
	Through insulation between live parts and accessible surfaces: 1.5mm	>2.0 mm	P
17	RESISTANCE OF INSULATING MATERIAL TO ABNORMAL HEAT AND TO FIRE		--
	Glow-wire test		P
	Parts of insulating material to retain current-carrying parts: 750 °C		P
	Other parts: 650 °C		P

Sub-clause 7 Dimension of plug shall comply with standard sheet1. Unit (mm)

Location	Sample No. 1	Sample No. 2	Sample No. 3	Limit
A	26.08	26.10	26.08	$26.1 \pm 0.5^{*1}$
B	14.01	14.04	14.02	$13.7 \pm 0.7^{*1}$
C	35.22	35.25	35.23	$35.3 \pm 0.7^{*1}$
(see note *1)	18.16	18.19	18.17	≥ 18
D	18.66	18.68	18.69	19 ± 0.5
E	3.98	3.97	3.99	$\varnothing 4.0 \pm 0.06$
F	3.34	3.31	3.30	$\varnothing 3.8 \text{ Max.}$
F	3.88	3.86	3.88	$\varnothing 4.0 \text{ Max.}^{*3}$
F	3.60	3.61	3.59	4.0 Max.^{*3}
G	10.52	10.51	10.50	10-11
a1 (Engagement)	18.69	18.71	18.68	$18-19.2^{*2}$

Attachment No. 6

EN 50075				
Clause	Requirement + Test		Result - Remark	Verdict

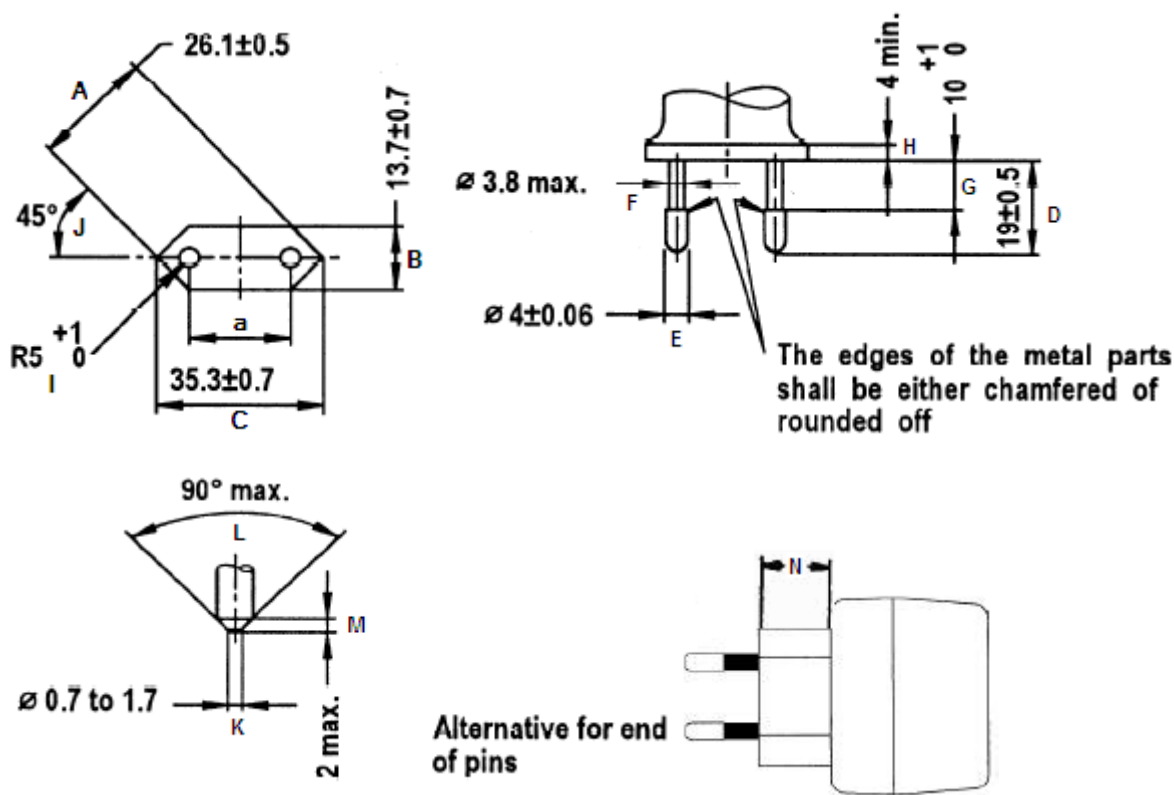
a2 (End)	17.13	17.15	17.11	17-18 ^{*2}
H	N/A	N/A	N/A	4 Min.
I	5.24	5.21	5.23	R5-R6
J	44.97	44.95	44.98	---
Alternative for end of pin				
K	N/A	N/A	N/A	φ0.7-1.7
L	N/A	N/A	N/A	90° max.
M	N/A	N/A	N/A	2.0 max.

Note

***1:** These dimension shall not exceeded within a distance of 18mm from the engagement face of plug.

***2:** a1: in the plane of the engagement face, a2: at the ends of pins.

***3:** This dimension maybe increased to 4mm within a distance of 4mm from engagement face of plug.





Attachment No. 7

PRODUCT INCORPORATING PINS FOR INSERTION INTO UK SOCKET OUTLET TEST ACCORDING TO APPLICABLE REQUIREMENTS FROM BS1363-3 AND ASTA BEAB REQUIREMENT 4 (ABR4)

BS 1363-3:1995 + Amd. No. 9543, 14225, 14540, 17437 & A4			
Clause	Requirement – Test	Result – Remarks	Verdict
12.1	Disposition of pins		P
12.2	Dimensions	(See appended table)	P
12.2.1	Gauging test according to finger 5, the plug portion shall enter the gauge fully with a force less than 10N	Applied force: 3N	P
	In the case of adaptors with ISODs, the test given in 13.8 of BS 1363-2:1995 shall be applied and the maximum withdrawal force from a socket-outlet conforming to BS 1363-2 shall not exceed 36N	Applied force: 3N	P
12.3	Distance of pins from periphery	Measured distance: L: 10.4mm, N: 10.4mm	P
12.7	Fixing of cover		N/A
12.9	Deformation immediately following the temperature rise test specified in the appropriate (base) standard		P
12.11	Construction of pins		P
12.11.1	All exposed surfaces of the adaptor plug pins shall be smooth and free from burrs or sharp edges and other irregularities.		P
12.11.4.1	For solid pins, applying a force 1100N on the pin according to figure 32.		P
12.11.4.2	For non-solid pins, conformity shall be checked by the following test. 1) Applying a force 800N on the pin according to Figure 32. 50 times without impact. 2) Separate specimens applying a force 1100N on the pin according to Figure 32.		N/A
12.11.4.3	For ISOD, applying a force 400N on the pin according to figure 32.		P
12.11.5.1	Adaptors with non-solid pins shall not cause excessive wear to socket contacts or shutters of sockets-outlets		P



Attachment No. 7

BS 1363-3:1995 + Amd. No. 9543, 14225, 14540, 17437 & A4			
Clause	Requirement – Test	Result – Remarks	Verdict
12.11.5.2	Adaptors with ISOD shall not cause excessive wear to socket contacts or shutters of sockets-outlets. One type of socket-outlet shall preferably have a shutter-operating ramp of metal.		P
12.11.6.1	1 Nm torque test on the opposite two directions according to figure 33		P
12.13	Retention of pins		P
12.14	Flexibility of pins		P
12.18	Insulating sleeves on pins		P
12.19.3	Abrasion resistance of insulating sleeve		P
13.10	The total mass of the equipment with all specified connectors shall not exceed 800g. The torque exerted on socket shall not exceed 0.7 Nm	Measured torque: Max. 0.021Nm	P

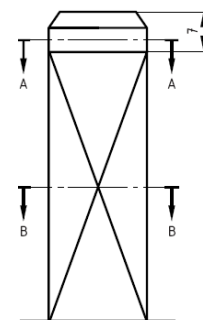
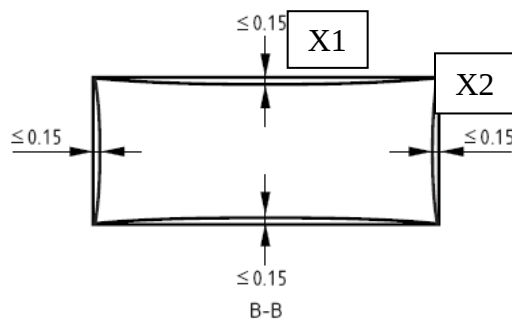
BS 1363-1:1995 + Amd. No. 9541, 14539, 17435 & A4 Additional requirements For plug portion with Insulated Shutter Opening Device (ISOD)			
Clause	Requirement – Test	Result – Remarks	Verdict
12.9.1	All exposed surfaces of plug pins shall be smooth and free from burrs or sharp edges and other irregularities which could cause damage or excessive wear to corresponding socket contacts or shutters		P

Additional test for adaptor with UK plug need to comply with IEC60950-1 (CB bulletin, IEC60950-1:2005+A1:2009, clause 4.3.6)			
Clause	Requirement – Test	Result – Remarks	Verdict
12.17.2	Electric strength test applied between the metal part of plug pin and the sleeve (1250±30V)		P
12.17.4	Placed in a heating cabinet at 125(-8, 0)°C for a period of 120(-5, 0)min, after which the specimen is removed and immediately cooled by immersion in water at approximately room temperature. The thickness of the insulation remaining at the point of impression is measured and shall not have been reduced by more than 50 %.		P
22.2	75C ball pressure test to ISOD.		P
23	750C GWT to ISOD.		P



Attachment No. 7

Clause 12.2: Dimensions measurement				
Dimensions(mm)	Sample A	Sample B	Sample C	Limit
A	24.73	24.74	24.73	25.37 max
B	32.64	32.65	32.63	34.6 max
C	N/A	N/A	N/A	15 min.
D	10.42	10.43	10.45	9.5 min.
E (L-E)	11.08	11.07	11.09	11.05-11.18
E (N-E)	11.09	11.08	11.08	11.05-11.18
F (L-E)	22.23	22.22	22.21	22.10-22.36
F (N-E)	22.22	22.24	22.22	22.10-22.36
G1	6.30	6.29	6.31	6.22-6.48
G2	6.31	6.30	6.29	6.22-6.48
H	3.96	3.95	3.96	3.90-4.05
I	22.61	22.60	22.59	22.23-23.23
J	1.81	1.83	1.80	1.35-1.85
K(earth)	N/A	N/A	N/A	7.80-8.05
K (ISOD)	7.94	7.95	7.94	7.75-8.05
L (line)	9.08	9.07	9.08	9.5 max
L (neutral)	9.06	9.09	9.07	9.5 max
M (line)	8.89	8.88	8.89	9.2 max
M (neutral)	8.92	8.91	8.92	9.2 max
N (line)	3.99	4.00	3.99	3.90-4.05
N (neutral)	4.00	3.98	3.98	3.90-4.05
O (line)	17.97	17.95	17.97	17.20-18.20
O (neutral)	17.98	18.0	17.99	17.20-18.20
P (line)	1.63	1.61	1.63	1.35-1.85
P (neutral)	1.62	1.64	1.61	1.35-1.85
Q	6.40	6.41	6.39	6.35 min.
R (line)	1.64	1.65	1.64	1.2-2.0
R (neutral)	1.63	1.64	1.66	1.2-2.0
W	0.56	0.57	0.54	R 0.1-1.0
θ 1	60.37	60.31	60.33	58°-62°
θ 2 (line)	68.11	68.12	68.13	60°-80°
θ 2 (neutral)	68.10	68.10	68.12	60°-80°
X1 (for ISOD only)	0.10	0.09	0.12	0.15 max
X2 (for ISOD only)	0.09	0.11	0.11	0.15 max
Alternative chamfers on L and N pin				
S (line)	N/A	N/A	N/A	1.35-1.85
S (neutral)	N/A	N/A	N/A	1.35-1.85
θ 3 (line)	N/A	N/A	N/A	58°-62°
θ 3 (neutral)	N/A	N/A	N/A	58°-62°
θ 4 (line)	61.14	61.13	61.13	58°-62°
θ 4 (neutral)	61.12	61.12	61.14	58°-62°
T (line)	1.63	1.61	1.63	1.35-1.85
T(neutral)	1.62	1.64	1.61	1.35-1.85
U (line)	N/A	N/A	N/A	0.2 Max.
U(neutral)	N/A	N/A	N/A	0.2 Max.
V (line)	N/A	N/A	N/A	1.35-1.85
V(neutral)	N/A	N/A	N/A	1.35-1.85

[illegible]

**Attachment No. 8**

“AU plug portion”, according to Appendix J of
Australian/New Zealand Standard AS/NZS 3112:2011+A1:2012+A2:2013(2 pins)

Clause	Requirement – Test	Remarks – Result	Verdict
Annex J	APPENDIX J, EQUIPMENT WITH INTEGRAL PINS FOR INSERTION INTO SOCKET-OUTLETS		Pass
J1	Scope This Appendix applies to only the plug portion of equipment with integral pins and shall be read in conjunction with Section 2 contained in the body of this Standard. Where the term ‘plug’ is used in Section 2 it shall be taken to mean the plug portion of equipment with integral pins. This Appendix sets out the dimensional and constructional requirements, including the attachment of the integral pins of plug portions of equipment with integral pins. It does not, however, include requirements for electrical connections to the integral pins or other requirements, which are covered by the relevant product standard for the equipment with integral pins.		Pass
J2	Requirments for the plug portion		Pass
J 2.1	Plug portion A plug portions is that portion of equipment with integral pins shown in Figure 2.1, including the plug pins, terminals of the plug pins and external dimensions of the ‘maximum projection’.	See appended table	Pass
J 2.2	Requirements		Pass
J 2.2.1	General The following provisions apply to the dimensional and constructional requirements of the plug portion of equipment with integral pins. It is not intended that this Appendix apply to equipment with integral pins that are covered by particular product standards. However, where such devices have plug portions, their standards may refer to this Appendix, to supplement the requirements contained in those particular product standards.		Pass
J 2.2.2	Plug pins of plug portions		Pass
	Material for pins	Copper: ≥58%	Pass
	Assembly of pins		Pass
	Form of pin		Pass
	Insulation of plug pins		Pass
J 2.2.3	Ratings and dimensions for low-voltage plug portions		Pass
	General		Pass
	Compliance with dimensional requirements of Figure 2.1		Pass



Clause	Requirement – Test	Remarks – Result	Verdict
J 2.2.4	Internal connections for plug portions		N/A
J 2.2.5	Arrangement of earthing connections for plug portions		N/A
J 2.2.6	Configuration of plug portions		Pass
J 2.2.7	Tests		Pass
J 2.2.7.1	General		Pass
J 2.2.7.2	High voltage test (3112.2.13.3)		Pass
	The plug shall withstand without failure an a. c. voltage of the value indicated in Table 2.3, applied between the parts set out in Items (a) and (c) of Clause 2.13.2 for 1 min in each case.		Pass
	The plug shall further withstand, without failure, a voltage of 3500 V a. c. applied between the parts set out in Items (b) and (d) of Clause 2.13.2 for 1 min in each case.		Pass
	The insulation of insulated pin plugs shall withstand a voltage of 1 250V a. c. for 1 min applied in accordance with Clause 2.13.2(e).		Pass
J 2.2.7.3	Mechanical strength of pin tests		Pass
J 2.2.7.3.1	Tumbling barrel test		Pass
	The tumbling barrel test is applied to determine the mechanical strength of the plug pins.		Pass
	Three samples which have not been subjected to any previous test are tested to the requirements of Clause 2.13.7 however, the test is modified for plug portions of equipment with integral pins as follows:		Pass
	A sample of equipment with integral pins is dropped –		Pass
	a) 500 times if the mass of the specimen does not exceed 250 g. 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		Pass
	b) 250 times if the mass of the specimen exceeds 250 g. The pins being straightened after 25 drops and at the completion of the test to pass through the appropriate gauge of Figure A1, B1 or F1		N/A
	Following each test the samples shall comply with Item (e) of Clause 2.13.7.1.		Pass
J 2.2.7.3.2	Pin bending test		Pass
	The pins of the plug portion of three samples not subjected to any previous tests shall be tested for compliance with the pin bending test of clause 2.13.7.2.		Pass
	All flat-pins of plugs rated up to and including 15 A shall be subjected to a pin bending test.		Pass

Attachment No. 8



Clause	Requirement – Test	Remarks – Result	Verdict
	Three sample plugs not subjected to any previous tests shall be tested as follows: Pins of assembled plugs shall be tested by clamping the plug in a rigid holding block and applying a bending force, as shown in Figure 2.8, to the pin under test. The pins shall be straight at the beginning of the test. If there is any doubt about the straightness of the pin, it shall be checked by the appropriate plug gauge shown in Appendices A, B or F. The point of application of the force shall be 14 ± 0.5 mm from the face of the plug. The direction of the force shall be along a line parallel to the face of the plug. Active and neutral pins shall be forced towards the centroid of the plug and then back to the starting point. On the first sample plug, any earth pin shall be forced but in one direction only and then back to the starting point. On the second sample plug, any earth pin shall be forced in the opposite direction to that used for testing the first sample plug. On the third sample plug, any earth pin shall be forced in the direction that gave the least favourable result during testing of the first two sample plugs. NOTE: This is intended to simulate damage that may occur when a plug is walked on and bent pins are straightened. The distance moved from the point of application shall be 7.5 ± 0.3 mm, and then the pin shall be forced back to the starting point. Any 'spring-back' is ignored NOTE: 'Spring-back' means that the pin is allowed to move back to a position less than the travel distance, when the force is removed. o the end point (7,5 mm), and back to the starting point is one cycle (i.e. one cycle is two separate movements). The speed of deflections shall be a maximum of 50 mm/s, without intentional delay between consecutive movements within each cycle. The interval between successive cycles shall be a minimum of 10 s. The duration of one cycle shall be a maximum of 60 s. The pins shall be tested for 20 complete cycles. After the tests the pins shall be inspected with normal or corrected to normal vision.		Pass

**Attachment No. 8**

Clause	Requirement – Test	Remarks – Result	Verdict
	The pin shall not be broken off. NOTE: Cracking of the pin, less than full thickness, is not deemed to be broken off. If in doubt pins shall be disassembled from the plug and any insulation removed, NOTE: In some cases the break may be below the face of the plug or the insulation may hold the broken pieces together, retaining electrical contact.		Pass
J 2.2.7.4	Temperature rise test (3112 2.13.8)		Pass
	2.13.8 Temperature rise test		Pass
	Plugs shall be so constructed that they comply with the following temperature rise test: a) Non-rewireable plugs are tested as delivered (specially prepared sample with access to terminals for temperature measurement). b) Rewireable plugs are fitted with polyvinyl chloride flexible cords with conductors having the minimum cross-sectional area specified in the manufacturers instructions.		Pass
	The terminal screws or nuts are tightened with a torque equal to two-thirds of that specified in test No.5. To ensure normal cooling of the terminals, the conductors connected to plugs should have a length of at least 1 m.	No screws or nuts used	N/A
	The plug shall be tested in a draught-free environment at the centre of a plane wooden board, which shall be at least 6 + 2 mm thick, 500 mm wide and 500 mm long with the rear completely enclosed in a wooden mounting enclosure (wall box) of 90 × 60 × 40 mm. Apertures in the wooden board for the plug pins to pass through are specified in Table 3.1, see Figure 2.9.		Pass

**Attachment No. 8**

Clause	Requirement – Test	Remarks – Result	Verdict
	Plugs are tested as follows: The appropriate clamping units with the dimensions specified in Figure 2.10 are fitted on each live pin of the plug, together with the thermocouple. The screw is then placed approximately in the middle of the bare part of the pin and tightened with a torque of 0.8 Nm. The clamping unit is fitted with PVC-insulated conductors at least 1 m long, having nominal cross-sectional areas as shown in Table 3.3. Where the conductors pass through the wooden mounting enclosure (wall box) there shall be a complete airtight seal between the conductors and the enclosure. An alternating current of 1.1 times the rated current of the plug is then passed through each live pin/clamping unit for 1 h. For plugs with three poles or more, the current during the test shall be passed through the phase contacts, where applicable. In addition, separate tests shall be made passing the current through the neutral contact, if any, and the adjacent phase contact.		Pass
	The temperature rise of the pins shall not exceed 45 K irrespective of the temperature rise of parts specified in end-product standards.		Pass
J 2.2.7.5	Securement of pins of the plug portion (3112 2.13.9)		Pass
	Movement of pins (2.13.9.1)		Pass
	Plugs shall be tested for pin movement by clamping the pin or pins not under test in a rigid holding block positioned 5 ± 0.5 mm from the plug face and applying a force of 18 ± 1 N to the pin under test. The design of the block shall be such that the pin under test shall not come into contact with the block during the test.		Pass
	Except for non-rewireable plugs, the test shall be carried out without a cord attached to the plug, and with the terminal screws loosened sufficiently to allow a 1mm ² conductor to be connected.		N/A
	The plug and test equipment shall be preconditioned at a temperature of $40 \pm 1^\circ\text{C}$ for 1 h, without the test force applied. Throughout the test, all parts of the plug and test equipment shall be maintained at this temperature.		Pass
	For all plugs, the point of application of the force of the plug along the pins, and the direction of the force shall be- a) in both directions along the line perpendicular to the plane of the pin, and passing through the centre of the pin; and b) in that plane in both directions along a line at right angles to that specified in Item(a).		Pass



Attachment No. 8

Clause	Requirement – Test	Remarks – Result	Verdict
	Over a period of 10 s, the force shall be gradually applied to each of the pins in the manner prescribed in Items (a) and (b), maintained at its maximum value for 10 s, and then released. The deflection of the pins shall be measured along the line of force relative to the face of the rigid holding block during the period when the force is applied. The maximum deflection shall not exceed 2.0 mm.		Pass
	Following the test on all pins of a plug conforming to Figure 2.1, any distortion 5 min after the completion of the test on the last pin shall be such that it will not prevent the plug from being inserted in the appropriate standard gauges shown in Appendix A, Appendix B and Appendix F without the application of undue force.		Pass
	For other types of plugs, any distortion after 5 min shall be such as will not prevent the plug being inserted into an appropriate socket-outlet without the application of undue force.		N/A
	Fixing of pins (2.13.9.2)		Pass
	A separate sample of a plug shall be heated to a temperature of $50 \pm 20^\circ\text{C}$ for 1 h and maintained at that temperature during the whole of tests, including the 5 min period after removal of the test load.		Pass
	The plug shall be held firmly in such a manner that there will be no undue squeezing or distortion of the body, and the means of holding shall not assist in maintaining the pins in their original position,		Pass
	Each pin, in turn, shall have applied to it a force which, over a period of 10 s, shall be increased steadily to $60 \pm 0.6\text{N}$ and held at this value for 10 min.		Pass
	Two tests on each pin shall be conducted, one with the direction of force along the length of the pin towards the body of the plug, and the other with the direction of force along the length of the pin away from the body.		Pass
	The attachment of pins shall be considered inadequate if any pin is displaced relative to the adjacent material of the body by more than 2.4 mm at any time during these tests, 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,		Pass
J 2.2.7.6	Tests on the insulation material of insulated pin plug portions (3112.2.13.13)		Pass
	2.13.13 Additional tests on the insulation material of insulated pin plugs		Pass
	2.13.13.1 General		Pass

Attachment No. 8



Clause	Requirement – Test	Remarks – Result	Verdict
	The material of the pin-insulation shall be resistant to the stresses to which it may be subjected at the high temperature likely to occur in conditions approaching the bad connection conditions and at low temperatures in particular conditions of service.		Pass
	Compliance shall be checked by the tests of Clause 2.13.13.2 to 2.13.13.6.		Pass
	2.13.13.2 Pressure test at high temperature		Pass
	One insulated pin only shall be subjected to the following test by means of the apparatus shown in Figure 2.5. This apparatus shall have a blade with a round shape, diameter of 6 mm and a thickness of 0.7 mm.		Pass
	The sample shall be placed in position as shown in the Figure 2.5 and a force of 2.5 N shall be applied through the blade to specimen.		Pass
	The apparatus, with the sample in position, shall be maintained for 2 h in a heating cabinet at a temperature of 160±5°C. The sample shall then be removed from the apparatus and within 10 s, cooled by immersion in cold water.		Pass
	The thickness of the insulation shall be measured immediately at the point of impression.		Pass
	The thickness of the insulation remaining at the point of impression shall be measured and shall not have been reduced by more than 50%.		Pass
	Visual inspection shall be made and no cracks on the insulation material shall be visible with normal, or corrected to normal, vision without additional magnification, and the dimension of the insulating material shall not have changed below the minimum size shown in Figure 2.4.		Pass
	2.13.13.3 Static damp heat test		Pass
	An insulated pin plug shall be subjected to two damp heat cycles in accordance with IEC 60068.2.30. Db (12+12 h cycle), 95% relative humidity, lower temperature 25±3°C and upper temperature 40°C.		Pass

Attachment No. 8

Clause	Requirement – Test	Remarks – Result	Verdict
	After this treatment and after recovery to room temperature, the specimen shall be subjected to- 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. NOTE: At the manufacturer's option, the same sample may be used for this test and the low temperature test (see Clause 2.13.13.4) and a single abrasion test may be done.		Pass
	2.13.13.4 Low temperature test		Pass
	An insulated pin plug shall be maintained at $-15\pm 2^{\circ}\text{C}$ for at least 24 h and returned to room temperature.		Pass
	The specimen shall be subjected to – 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. NOTE: At the manufacturer's option, the same sample may be used for this test and the static damp heat test (see Clause 2.13.13.3) and a single abrasion test may be done.		Pass
	(d) Impact test at low temperature (2.13.13.5)		Pass
	A specimen of one insulated pin only shall be subjected to an impact test by means of the apparatus shown in Figure 2.6. The mass of the falling weight shall be 100 ± 1 g.		Pass
	The apparatus, on a sponge rubber pad 40 mm thick, together with the specimen, shall be maintained at $-15\pm 20^{\circ}\text{C}$ for at least 24 h.		Pass
	At the end of this period, the specimen shall be placed in position, as shown in Figure 2.6, and the falling weight shall be allowed to fall from a height of 100mm. Four impacts shall be applied successively to the same specimen, rotating it through 90° between impacts.		Pass
	After the test the specimen shall be allowed to return to room temperature and then examined, No cracks of the insulating material shall be visible with normal, or corrected to normal, vision without additional magnification. NOTE: The cooling period of 14 h includes the time necessary to cool down the apparatus.		Pass

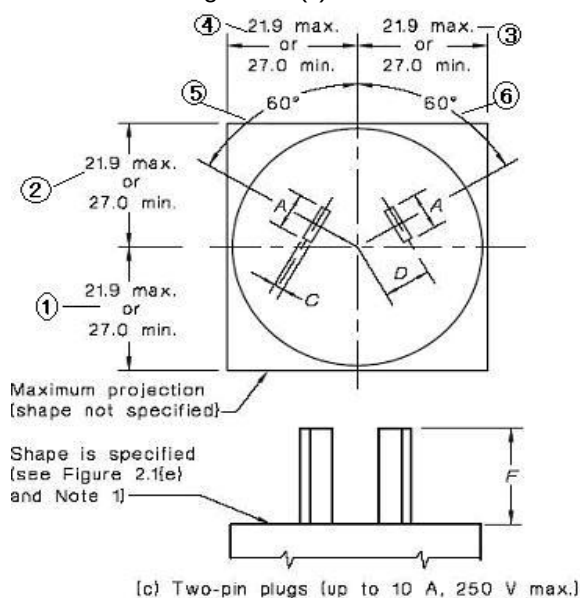
**Attachment No. 8**

Clause	Requirement – Test	Remarks – Result	Verdict
	(e) Abrasion test (2.13.13.6)		Pass
	An insulated pin of an insulated pin plug shall be subjected to the following test by means of an apparatus as shown in Figure 2.7.		Pass
	The test apparatus comprises a horizontally disposed beam, which shall be pivoted about its centre point. A short length of steel wire, 1 mm in diameter and bent into a U-shape, the base of the U being straight, shall be rigidly attached, at both ends, to one end of the beam, so that the straight part projects below the beam and shall be parallel to the axis of the beam pivot.		Pass
	The plug shall be held in a suitable clamp in such a position that the straight part of the steel wire rests on the major axis face of the plug pin, at right angles to it. The pin shall slope downwards at an angle of 10° to the horizontal.		Pass
	The beam shall be loaded so that the wire exerts a force of 4 N on the pin.		Pass
	The plug shall be moved backwards and forwards in horizontal direction in the plane of the axis of the beam, so that the wire rubs along the pin. The length of the pin thus abraded shall be approximately 9 mm, of which approximately 7 mm shall be over the insulation.		Pass
	The number of movements shall be 20 000 (10 000 in each direction) and the rate of operation shall be 30 movements per min.		Pass
	After the test, the pins shall show no damage which may affect safety or impair the further use of the plug, in particular, the insulating sleeve shall not have punctured or rucked up.		Pass
J 2.2.7.7	Equipment with integral pins intended to be supported by the contacts of a socket-outlet		Pass
	Equipment with integral pins intended to be supported by the contacts of socket-outlets shall not impose undue strain on those socket-outlets.		Pass

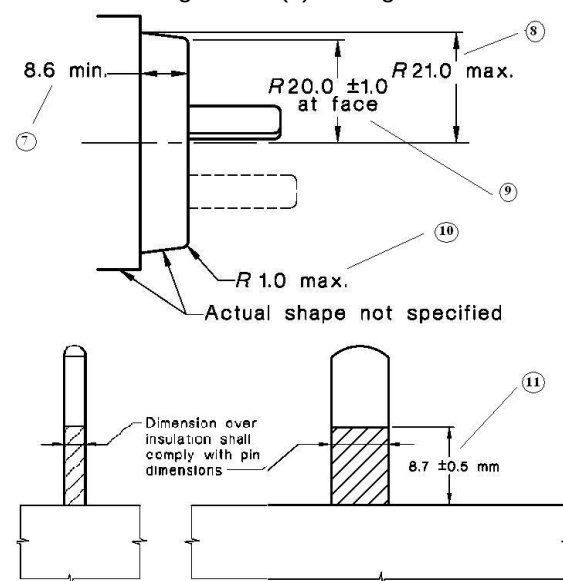
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Clause	Requirement – Test	Remarks – Result	Verdict
	Unless requirements are contained in the relevant product standard, compliance is checked by inserting the equipment with integral pins, as in normal use, into a flush-mounting combination switch socket-outlet complying with this Standard, the socket-outlet being pivoted about a horizontal axis through the centre-lines of the contact apertures at a distance of 8 mm behind the engagement face of the socket-outlet. (See Figure I1). The additional torque, which has to be applied to the socket-outlet to maintain the engagement face in the vertical plane, shall not exceed 0.25 N.m. Where the equipment with integral pins is fitted with a flexible cord, the test is conducted with the centre-line of the axis of pivot of the socket-outlet located at a point 500 mm above a horizontal surface. The flexible cord is allowed to hang freely from the equipment with that flexible cord in excess of 500 mm resting on the horizontal surface during the test.	Max. torque: 0.02Nm	Pass
J2.3	Where a plug portion is detachable, compliance shall be established by assessment with the plug portion fully assembled with the equipment. Access to live parts shall be assessed for incorrect assembly of the plug portion. It shall not be possible to assemble the plug portion to the equipment resulting in a dangerous situation allowing access to live parts. The plug portion shall not expose live parts prior to assembly.		N/A

Standard sheet Figure 2.1(c)



Standard sheet Figure 2.1 (e) and fig 2.4

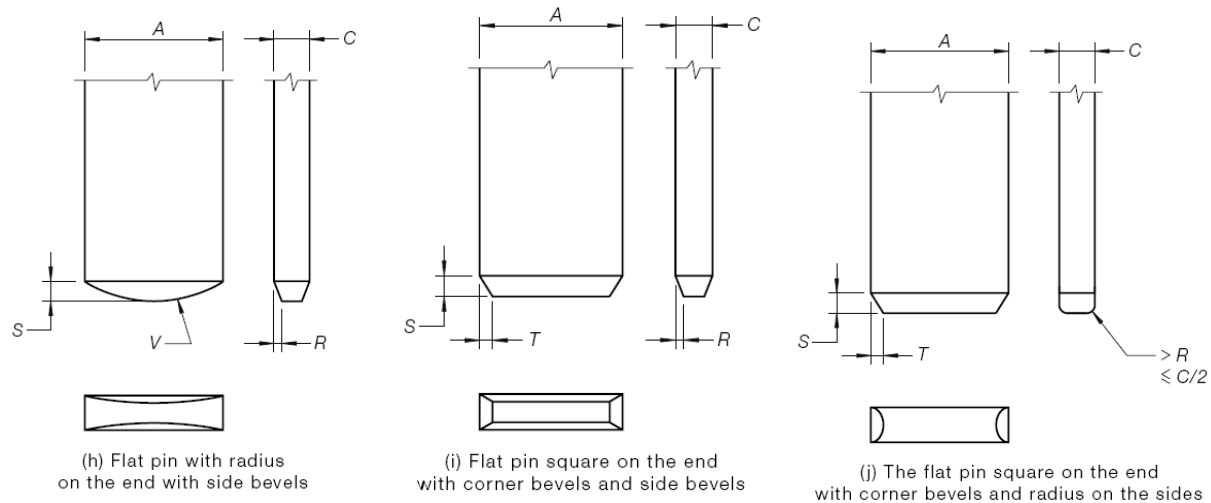


Attachment No. 8

Position	Required (mm)	By Measurement (mm)	By the gauges in Figure A1
A	6.35±0.15	6.36	--
C	1.63 ^{+0.15} _{-0.05}	1.66	--
D	7.92 †	Pass	--
F	17.06±0.4	17.40	--
1	21.9 max. or 27.0 min.	45.80	--
2	21.9 max. or 27.0 min.	29.90	--
3	21.9 max. or 27.0 min.	21.10	--
4	21.9 max. or 27.0 min.	21.10	--
5	60°	Pass	--
6	60°	Pass	--
7	8.6 min.	8.72	--
8	21.0 max.	20.70	--
9	20.0±1.0	--	--
10	1.0 max	0.90	--
11	8.7±0.5	9.01	--
The distance between alive pin of any plug and the edge of the moulding of the plug		Min. 9 (Required)	10.24
Protrude on front face of plug		Max. 0.5 (Required)	0.1
Note: 1. *Dimension 9 is not applicable for insulated pin. 2. † dimension without tolerances are nominal. Samples are to be checked with the gauge specified in Appendix A, Appendix B or Appendix F, as appropriate.			

Dimensions checked by gauge and measurement

Standard sheet Figure 2.1



Position	Required (mm)	By Measurement (mm)	By the gauges in Figure A1
Plug type (h)			
R	0.35 ± 0.05	0.34	-
S	0.9 ± 0.1	0.94	-
T	≥ 0.60	--	-
V	6	Pass	-



Attachment No. 9

JIS C 8303: 2007			
Clause	Requirement – Test	Result – Remark	Verdict
APPENDIX	JIS C 8303: 2007 – PLUGS AND RECEPTACLES FOR DOMESTIC AND SIMILAR GERERAL USE (Type inspection)		
EXPLANATION FOR ABBREVIATIONS P=Pass, F=Fail, N/A=Not applicable. Placed in the column to the right.			
4	Classification, numbers of poles, pole arrangement and rating	Plug as Figure A1 used	P
5	Performance		P
5.1	Retaining force	For socket only and movable blade plug only	N/A
5.2	Temperature Rise	For socket only and movable blade plug only	N/A
5.3	Contact resistance	Not required for plug and socket without earth pole	N/A
5.4	Make and Break	For socket only and movable blade plug only	N/A
5.5	Insulation resistance	Before test 100M Ohm After test 100M Ohm	P
5.6	Dielectric withstand voltage	1250V, 10mA, 1 min. required	P
5.7	Resistance to heat	No resin moldings or rubber moldings	P
5.8	Strength of screw terminal and lead-wire joint		P
5.9	Strength of blade fixing part		P
5.10	Rotating property of movable plug type		N/A
5.11	Strength of enclosure		P
5.12	Strength of Cord anchorage		P
5.13	Strength of Cord outlet		P
5.14	Performance of screwless terminals		N/A
5.15	Endurance to ammonia gas	Applied for socket-outlets only	N/A
5.16	Tensile load		N/A
5.17	Waterproof		N/A
5.18	Flame retardance	No supply wire connected	N/A
5.19	Moisture retardance	No supply wire connected	P
6	Construction, dimensions and material		P
6.1	Construction in general		P
6.2	Terminals	AC plug pins were moulded into enclosure directly	N/A



Attachment No. 9

JIS C 8303: 2007			
Clause	Requirement – Test	Result – Remark	Verdict
6.3	Insulation	Enclosure material: V-0	P
6.4	Materials of conductive metal parts		P
6.5	Material of non-conductive metal parts	No such part	N/A
6.6	Shapes and dimensions of blades and blade receiving holes	See measured dimension	P
6.7	Dimensions of mounting parts of recessed socket-outlets		N/A
6.8	Dimensions of cable entry		N/A
6.9	Insulation distance		P
6.10	Symbol of poles	No earth pole or a pole of earth side.	N/A
6.11	Locking type, slip-check connectors		N/A
6.12	Waterproof connectors		N/A
7	Testing methods		P
7.1	Construction test	Considered.	P
7.2	Retaining force test		N/A
7.3	Temperature rise test		N/A
7.4	Contact resistance test		N/A
7.5	Make and break test		N/A
7.6	Insulation resistance test		P
7.7	Dielectric withstand voltage test		P
7.8	Heat resistance test		P
7.9	Strength test of screw terminal and lead-wire joint		P
7.10	Strength of blade fixing part	For mold on plug pins on thermoplastic material, (b) and (c) considered.	P
	(a): pull test from blade holes , 100N in the direction at right angles to the blade surface for 1 min.		N/A
	(b): pull test from blade holes, 100N downward for 2 mins		P
	(c): Molded-on connectors		P
	(1) Specimen keep in temperature 20±2°C for 1 hr. in figure 1. A force is applied to one blade until the tip touched other blade.		N/A

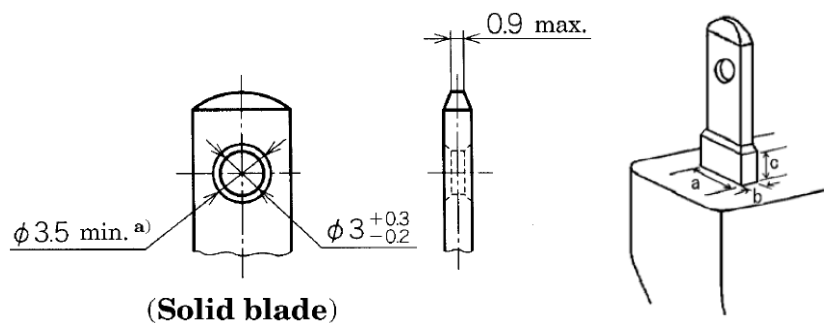
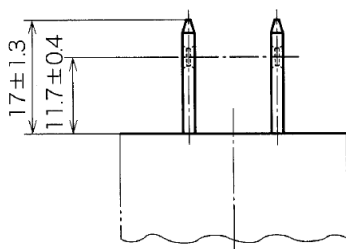
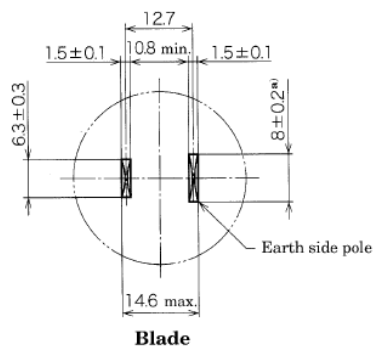


Attachment No. 9

JIS C 8303: 2007			
Clause	Requirement – Test	Result – Remark	Verdict
	(2) Specimen keep in temperature 20±2°C for 1 hr. in figure 2. blade move right and left 15° for 30 times, 10 times per minute.		P
	(3) Blade fixed as figure 3 move right and left 30° for 5 times.		P
7.11	Enclosure Strength tests		P
	(a) Enclosure compressing test	600N applied on the wider side of specimen between 5mm thick to 60 rubber sheet on top of 15mm or more thick hardwood board for 1 minute.	P
	(b) pendulum free fall test		N/A
	(c) single body free fall test		N/A
7.12	Strength test of Cord anchorage		P
7.13	Strength test of Cord outlet		P
7.14	Tensile strength test of screwless terminals		N/A
7.15	Bending test for screwless terminal		N/A
7.16	Cyclic heating test for screwless terminal		N/A
7.17	Withstand overcurrent test for screwless terminal		N/A
7.18	Ammonia gas durability test		N/A
7.19	Rotating test of movable plug-blade type		N/A
7.20	Tensile load test		N/A
7.21	Waterproof test		N/A
7.22	Flame retardance test		N/A
8	Inspection		P
8.1	Type inspection		P
8.2	Acceptance inspection		P
9	Designation of products		P
10	Marking	Plug portion is an integral part on appliance enclosure, refer to appliance ratings	P

Attachment No. 9

Measured dimensions of the plug portion (per JIS C 8303 or IEC 60 083)				P
Location	Measured dimensions (mm)			Limit of dimensions (mm)
	Sample 1	Sample 2	Sample 3	
A	14.08	13.99	14.11	14.6 max.
B	10.96	10.86	10.93	10.8 min.
C	1.46	1.49	1.47	1.5 ± 0.1
D	6.23	6.27	6.31	6.3 ± 0.3
E	--	--	--	8 ± 0.2 ¹⁾
F	3.23	3.25	3.22	$\varnothing 3 + 0.3 / - 0.2$
G	3.86	3.62	3.73	$\varnothing 3.5$ min. ^{a)}
H	11.69	11.74	11.62	11.7 ± 0.4
J	16.72	16.68	16.69	17 ± 1.3
K	0.87	0.88	0.88	0.9 max.
For pin sleeve				
a	--	--	--	<6.7mm
b	--	--	--	<1.9mm
c	--	--	--	<5mm



Notes:

- 1) Where blades are not polarized, the blade width shall be $6.3\text{mm} \pm 0.3$ mm.