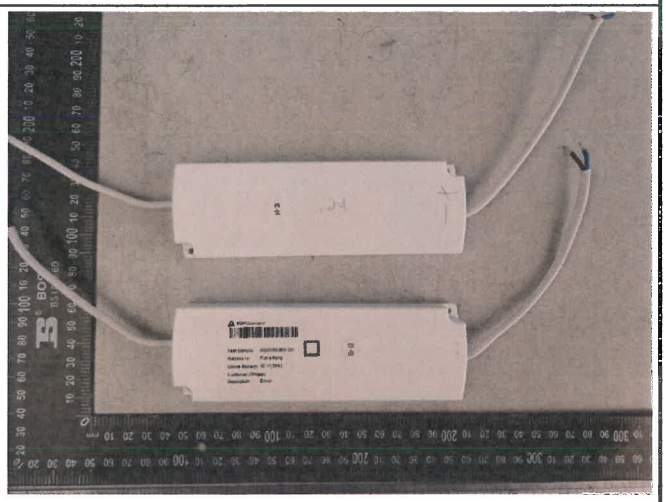
Prüfbericht-Nr.: *Test Report No.:*	**14717310 001**	**Auftrags-Nr.:** *Order No.:*	1160019957	Seite 1 von 58 *Page 1 of 58*
Kunden-Referenz-Nr.: *Client Reference No.:*	N/A	**Auftragsdatum:** *Order date:*	02.11.2015	
Auftraggeber: *Client:*	Ningbo Snappy Optoelectronics Co., Ltd.No.56, Keda Road National Hi-tech park of Ningbo Zhejiang 315040 P.R. China.			
Prüfgegenstand: *Test item:*	LED POWER SUPPLY			
Bezeichnung / Typ-Nr.: *Identification / Type No.:*	SNP30-12VFP, SNP30-24VFP, SNP30-12VF-3, SNP30-24VF-3.			
Auftrags-Inhalt: *Order content:*	Type test			
Prüfgrundlage: *Test specification:*	EN 61347-1:2015 EN 61347-2-13:2014 EN 62493:2010			

Wareneingangsdatum: *Date of receipt:*	02.11.2015
Prüfmuster-Nr.: *Test sample No.:*	1160019957
Prüfzeitraum: *Testing period:*	02.11.2015 – 13.01.2016
Ort der Prüfung: *Place of testing:*	TÜV Rheinland / CCIC (Ningbo) Co., Ltd.
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland / CCIC (Ningbo) Co., Ltd.
Prüfergebnis*: *Test result*:*	Pass



geprüft von / *tested by*:

Datum *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*
2016-01-13	Fiona Fang / PE	Fiona. Fang

kontrolliert von / *reviewed by*:

Datum *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*
2016-01-15	Chengchao Huang / TC	Chengchao Huang

Sonstiges / *Other*: TUV mark and CE-LVD issued.
Attachment list refer to page 4 of this report.

Zustand des Prüfgegenstandes bei Anlieferung: Prüfmuster vollständig und unbeschädigt
Condition of the test item at delivery: *Test item complete and undamaged*

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhaft
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
Legend:	*1 = very good*	*2 = good*	*3 = satisfactory*	*4 = sufficient*	*5 = poor*
	P(ass) = passed a.m. test specification(s)		*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

V04

Test Report issued under the responsibility of:

TÜVRheinland®

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

Report Number. .....:	14717310 001
Date of issue .....:	See cover page
Total number of pages.....	See cover page
Name of Testing Laboratory preparing the Report.....:	TÜV Rheinland / CCIC (Ningbo) Co., Ltd. 3F, Building C13, R&D Park, No.32 Lane 299 Guanghua Road, National Hi-Tech Zone, Ningbo 315048, P.R. China
Applicant's name.....:	Ningbo Snappy Optoelectronics Co.,Ltd.
Address .....:	No.56,Keda Road, National Hi-tech park of Ningbo, Zhejiang 315040 P.R.China
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 .....:	TUV mark & CE-LVD
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

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

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

General disclaimer:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test item description .....:	LED POWER SUPPLY
Trade Mark .....:	Snappy Optoelectronics
Manufacturer.....:	Ningbo Snappy Optoelectronics Co., Ltd. No.56, Keda Road, National Hi-tech park of Ningbo, Zhejiang 315040 P.R. China.
Model/Type reference.....:	SNP30-12VFP, SNP30-24VFP, SNP30-12VF-3, SNP30-24VF-3.
Ratings .....:	I/P: AC 200-240V; 50/60Hz; independent; SELV, ta:45℃, tc 85℃ . Details in “General product information”.

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):			
☒	**Testing Laboratory:**	TÜV Rheinland / CCIC (Ningbo) Co., Ltd.	
Testing location/ address ..... :		3F, Building C13, R&D Park, No.32 Lane 299 Guanghua Road, National Hi-Tech Zone, Ningbo 315048, P.R. China.	
☐	**Associated CB Testing Laboratory:**		
Testing location/ address ..... :			
Tested by (name, function, signature) ..... :		See cover page	
Approved by (name, function, signature) .. :		See cover page	
☐	**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 1: Equipment list (2 pages).

For assessment of lighting equipment related to human exposure to electromagnetic fields according to EN 62493:2010, report number: 14717506 001 (10 pages).

Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
SNP30-12VFP was selected to perform for all tests SNP30-24VFP was selected to perform for additional working voltage test. SNP30-12VF-3 was selected to perform for additional terminal block evaluation. Result: Pass.	TÜV Rheinland / CCIC (Ningbo) Co., Ltd. 3F, Building C13, R&D Park, No.32 Lane 299 Guanghua Road, National Hi-Tech Zone, Ningbo 315048, P.R. China.

Summary of compliance with National Differences:

List of countries addressed:

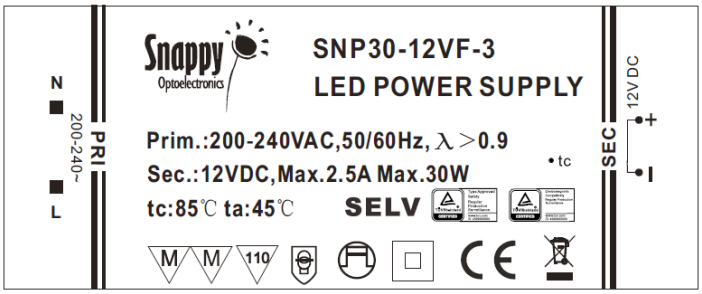
EU Group Differences.

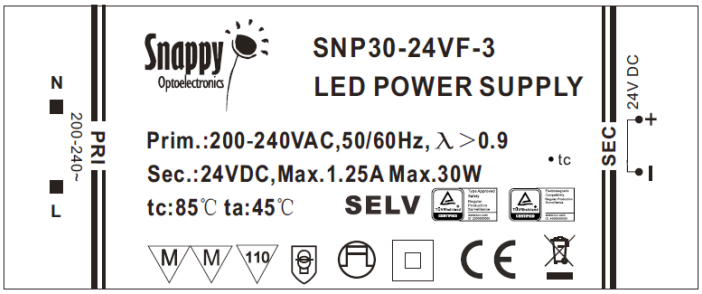
☒ **The product fulfils the requirements of EN 61347-2-13:2014 used in conjunction with EN 61347-1:2008 + A1:2011 + A2:2013.**

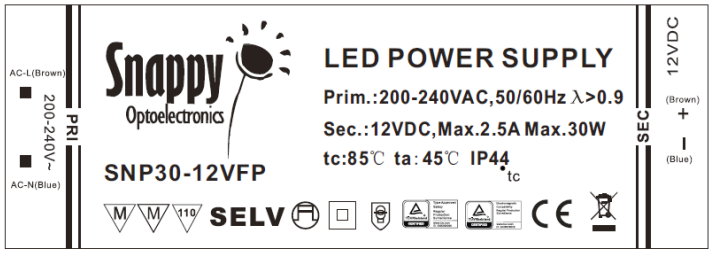
The products also comply with the standard EN 61347-1:2015, relevant deviation requirements between EN 61347-1:2008+A1:2011+A2:2013 and EN 61347-1:2015 are considered and evaluated, the details of deviation report see page 43 to page 57.

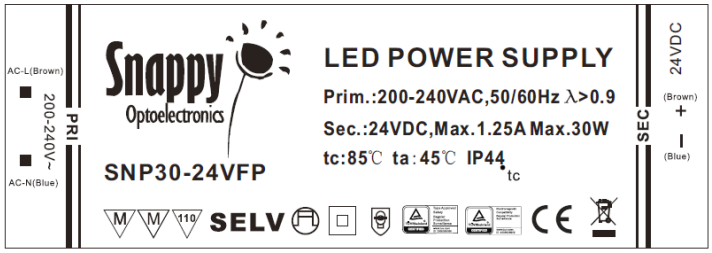
Copy of marking plate

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.









Test item particulars .....:	LED POWER SUPPLY
Classification of installation and use.....:	Independent, SELV controlgear
Supply Connection.....:	Refer to below 'general information '
.....:	
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 .....:	See cover page
Date (s) of performance of tests .....:	See cover page

General remarks:

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

ANNEX 4: EXTERNAL AND INTERNAL WIRING according to EN 60598-1 on page 39-41.

Appendix 1: Temperature Measurements for MM Mark (VDE 0710 Part 14/04.82) on page 43.

ATTACHMENT TO TEST REPORT IEC 61347-2-13 EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES on page 44.

Deviation report according to EN 61347-1:2015 on page 44-58.

Throughout this report a ☒ comma / ☐ point is used as the decimal separator.

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

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

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

Name and address of factory (ies) ..... :	Ningbo Snappy Optoelectronics Co.,Ltd. No.56,Keda Road, National Hi-tech park of Ningbo, Zhejiang 315040 P.R.China

General product information:

1. The LED power supply SNP30 series have the same schematic and PCB layout. Only the minor difference in secondary circuit. SNP30-12VFP and SNP30-24VFP have the same construction (with input and output flexible cord), SNP30-12VF-3 and SNP30-24VF-3 have the same construction (with input and output terminal block).
2. The LED power supply has plastic enclosure, Independent, Class II, and SELV, suitable for use together with LED lighting source.

Type or Model No.	Rated input voltage (VAC)	Output current(A)	Rated output voltage (VDC)	Ouput wattage (W)	ta value (°C)	tc value (°C)	IP
SNP30-12VFP	200-240 50/60Hz	Max.2.5	12	Max.30	45	85	44
SNP30-24VFP	200-240 50/60Hz	Max.1.25	24	Max.30	45	85	44
SNP30-12VF-3	200-240 50/60Hz	Max.2.5	12	Max.30	45	85	20
SNP30-24VF-3	200-240 50/60Hz	Max.1.25	24	Max.30	45	85	20

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	(see Annex O)	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 ≤ 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	See general product information	P
	c) symbol for independent controlgear, if applicable		P
	d) correlation between interchangeable parts and controlgear marked		N/A
	e) rated supply voltage (V)	200-240VAC	P
	supply frequency (Hz)	50/60Hz	P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	supply current (A)	In user manual	P
	f) earthing symbol		N/A
	k) wiring diagram		N/A
	l) value of t_c	85°C	P
	m) symbol for declared temperature	110	P
	t) LUM earthing symbol		N/A
	u) if not SELV maximum working voltage U_{out} between:	SELV	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 general product information	P
	- rated output voltage U_{rated} (V) ..... :	See general product information	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 (mm²)	In user manual	P
	j) number, type and wattage of lamp(s)		P
	s) SELV symbol		P
7.2 (-)	- declaration of mains connected windings		N/A

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

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 kΩ	(see Annex A)	P
- (A3)	Voltage > 35 V peak or > 60 V d.c. or protective impendance device	(see Annex A)	P
- (10.1)	Lacquer or enamel not used for protection or insulation		P
	Adequate mechanical strength on parts providing protection		P
- (10.2)	Capacitors > 0,5 μF: voltage after 1 min (V): < 50 V .....:	0,148μF	N/A
- (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		P
	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.24V d.c	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. .....:		N/A
	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		P
	Y1 or Y2 capacitors comply with IEC 60384-14		P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Resistors comply with test (a) in 14.1 of IEC 60065		N/A
9 (8)	**TERMINALS**		**P**
	Screw terminals according section 14 of IEC 60598-1:		**P**
	Separately approved; component list	(see Annex 1)	P
	Part of the controlgear	(see Annex 2)	P
	Screwless terminals according section 15 of IEC 60598-1:		**N/A**
	Separately approved; component list	(see Annex 1)	N/A
	Part of the controlgear	(see Annex 3)	N/A
10 (9)	**PROVISION FOR PROTECTIVE EARTHING**		**N/A**
- (9.1)	**Provisions for protective earthing**		**N/A**
	Terminal complying with clause 8		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 Ω ..... :		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

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	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 mm² and of copper or equivalent		N/A
	Protective earthing wires in line with 5.3.1.1 and clause 7		N/A
- (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 Ω ..... :		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 (MΩ):		P
	For basic insulation ≥ 2 MΩ ..... :	>500 MΩ between L-N after fuse open)	P
	For double or reinforced insulation ≥ 4 MΩ ..... :	>500 MΩ (between input circuit and output circuit) (between transformer's primary and secondary circuit) (between live parts and plastic enclosure)	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

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

12 (12)	ELECTRIC STRENGTH		P
	Immediately after clause 11 electric strength test for 1 min		P
	Basic insulation for SELV, test voltage 500 V	Between SELV circuit to enclosure	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	Between L-N after fuse open. Utest: 240V→ 1480V	P
	Supplementary insulation, 2U + 1000 V		N/A
	Double or reinforced insulation, 4U + 2000 V	Between input circuit and output circuit. Between input circuit and enclosure. For model with input voltage Utest 240V→ 2960V	P
	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		P
	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)	N/A
	Creepage distances on printed boards less than specified in clause 16 in Part 1 provided with coating according to IEC 60664-3		N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
- (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 ≥ 1 MΩ ..... :	> 500 MΩ	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		P
15 (-)	**TRANSFORMER HEATING**		**P**
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		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

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

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**		**N/A**
	No dangerous compatibility between output socket-outlet and a plug for socket-outlets for input circuit in relation to installation rules, voltages and frequencies		N/A
	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
	- plugs not able to enter socket-outlets of other standardised system		N/A
	- socket-outlets not admit plugs of other standardised system		N/A
	- socket-outlets without protective earth		N/A

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		N/A
	Creepage distances not less than minimum clearance		P

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

18 (17)	**SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS**		**P**
	Screws, current-carrying parts and connections in compliance with IEC 60598-1 (clause numbers between parentheses refer to IEC 60598-1)		P
(4.11)	**Electrical connections**		**P**
(4.11.1)	Contact pressure		P
(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
(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
	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)..... :	Bobbin 125°C, 0,4mm	P
	- part tested; temperature (°C)..... :	Enclosure 125°C, 1,6mm	P
	- part tested; temperature (°C)..... :	PCB 125°C, 0,6mm	P
- (18.2)	Test of printed boards:		P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	- part tested.....:	PCB	P
	- part tested.....:		N/A
- (18.3)	Glow-wire test (650°C):		P
	- part tested.....:	Enclosure	P
	- part tested.....:		N/A
- (18.4)	Needle flame test (10 s):		P
	- part tested.....:	Enclosure	P
	- part tested.....:	Bobbin	P
	- part tested.....:	PCB,	P
- (18.5)	Tracking test:		
	- part tested.....:	PCB	P
	- part tested.....:	Bobbin	P

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

14	**TABLE: tests of fault conditions**	**P**
Part	Simulated fault	Hazard
BD1	SC; The fuse open No operation	~~YES~~/NO
C115	SC; The fuse open No operation	~~YES~~/NO
C120	SC; The fuse open No operation	~~YES~~/NO
Q100 g-s	SC; The fuse open No operation	~~YES~~/NO
Q101 d-s	SC; The fuse open No operation	~~YES~~/NO
C202	SC; No operation	~~YES~~/NO
C203	SC; No operation	~~YES~~/NO
Output	SC; No operation	~~YES~~/NO
Output	SC; No operation	~~YES~~/NO
Remark: SC means short circuit, OC means open circuit.		

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

15.1	**TABLE: test of transformer heating (☒ Constant voltage ☐ Constant current)**		**P**
	Type reference:	SNP30-12VFP	
15.2	Test 1: Normal Operation		—
	1.06 times rated voltage:.....	1,06Un;254V	—
	Under ta = ...:	50,4°C	—
15.3	Test 2: Abnormal Operation: Short-circuit the output according to L.7		—
	1.1 or 0.9 times rated voltage:	0,9Un: 180V	—
	ta = ...:	49,7°C	—
	Test 3: Abnormal Operation: overload according to L.7		—
	1.1 or 0.9 times rated voltage:	0,9Un: 180V	—
	ta = ...:	51,4°C	—
	Test 4: Abnormal Operation: Double the number of LED modules or equivalent load.		—
	1.1 or 0.9 times rated voltage:	0,9Un: 180V	—
	ta = ...:	51,1°C	—

Temperature (°C) of Part	Cl. 15.1		Cl. 15.2			
	Test 1 (ºC)	Limit[3)]	Test 2 (ºC)	Test 3 (ºC)	Test 4 (ºC)	Limit[3)]
Input cord	76,5	90	76,61	76,85	77,07	--
CX1	67,83	100	66,86	66,99	67,00	--
C100	73,39	105	72,34	72,48	72,58	--
Q100	87,83	130	86,19	86,35	86,44	105
C115	86,83	105	84,55	84,71	84,77	--
Q101	95,03	130	93,93	94,23	94,00	--
C120	89,21	105	88,35	88,59	88,75	--
C202	90,04	105	90,21	90,58	90,80	105
CY	81,84	125	81,74	82,06	82,22	105
PRI. Winding of T1	92,28	130	92,15	92,48	92,69	175
SEC. winding of T1	90,66	130	90,88	91,39	91,74	175
PCB	84,36	130	84,22	84,58	84,79	--
Bobbin	93,33	130	93,12	93,40	93,40	--
tc point	70,23	85	69,97	70,48	70,85	110

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

Mounting surface	85,92	85	86,26	86,70	87,02	110
Enclosure inside	75,64	--	75,37	75,69	76,00	--
Output cord	54,15	90	53,86	53,94	54,06	--
Ambient temperature	45,63	--	45,60	45,43	45,31	--

Working Voltage Measurement	Test sample: SNP30-24VFP		
Supply voltage：240Vac, 50/60Hz; Output condition: Max Load or no load			
Location	V peak(V)	V rms(V)	Frequency (Hz)
TR1 PIN1-P1	44,0	2,6	11,0
TR1 PIN1-P2	8,0	1,7	555,6
TR1 PIN2-P1	8,0	1,6	112,4
TR1 PIN2-P2	32,0	2,3	12,3
TR1 PIN3-P1	348,0	336,5	1200
TR1 PIN3-P2	372,0	337,1	107,9
TR1 PIN4-P1	472,0	337,4	5,6
TR1 PIN4-P2	460,0	336,9	11,6
CY	48,0	22,75	50

Remark: the transformers have the same construction, only minor difference in secondary turns of wire.
Detail information refers to Annex 1.

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**						
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				See Annex I			
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				See Annex I			
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**						**N/A**

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

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							

18	**TABLE: Transformer check for SNP30-24VFP**	**P**
Construction details: Core: PC44		
Transformer TR1 manufacturer: Ningbo Snappy Optoelectronics Co,, Ltd, Type designation: SNP5,770,293		
Measured creepage distance base on Max, working voltage 337Vrms according to Annex I of EN 61347-2-13		
Location	Required (mm)	Measured (mm)
Pri, – Sec,	6,7	8,0
Pri, – Core	--	0
Sec, – Core	6,7	8,0
Measured clearance distance:		
Location	Required (mm)	Measured (mm)
Pri, – Sec,	5,8	8,0
Pri, – Core	--	0
Sec, – Core	5,8	8,0
Distance through insulation	Required (mm)	Measured (mm)
use reinforced insulation SEC, wire	--	--
Electric strength test: AC 3348V; 60s between Pri, to Sec,	Pass	
Specifications of winding:		
Primary winding: N1:25Ts(Φ0.35mmX1);N3: 6Ts(Φ0.14mmX3); N4:25Ts(Φ0.35mmX1); Secondary winding: N2: 10Ts(Φ0.5mmX1); Insulation: Class B (130ºC)		

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 .....:	Max.24V d.c	P
(A.3)	If voltage > 35 V peak or > 60 V d.c. or protective impendance device; touch current does not exceed 0,7 mA (peak) or 2 mA d.c. .....:		N/A
	Comply with Annex G of IEC 60598-1		N/A

C (C)	**ANNEX C – PARTICULAR REQUIREMENTS FOR ELECTRONIC LAMP CONTROLGEAR WITH MEANS OF PROTECTION AGAINST OVERHEATING**		**P**
(C3)	**GENERAL REQUIREMENTS**		**P**
(C3.1)	Thermal protection means integral with the convertor, protected against mechanical damage		P
	Renewable only by means of a tool		P
	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**		**P**
	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 ..:	Electronic protection	P
(C6)	**MARKING**		**P**
(C6.1)	Symbol for temperature declared thermally protected ballasts	110	P
(C6.2)	Declaration of the type of protection provided		P
(C7)	**LIMITATION OF HEATING**		**P**
(C7.1)	**Preselection test:**		**P**
	Test sample placed for at least 12 h in an oven having temperature (t_c - 5) K		P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	No operation of the protection device		P
(C7.2)	**Functioning of protection means:**		**P**
	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		P
	No operation of the protection device		P
	Introducing of the most onerous test condition determined during test of clause 14		P
	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		P
	Continuous measuring of the highest surface temperature		P
	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	110	P
	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**		P
	Tests in C7 performed in accordance with Annex D, if applicable		P
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
F	**ANNEX F - DRAUGHT-PROOF ENCLOSURE**		P
	Draught-proof enclosure in accordance with the description		P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Dimensions of the enclosure		P
	Other design; description		P
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 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	After 5s, 0V	P
(L.6)	**Heating**		**P**
	No excessive temperatures in normal use		P
	Value if capacitor t_c marked .....:	125°C	—
	Winding insulation classified as Class .....:	Class B	—
	Comply with tests of clause 14 of IEC 61558-1 with adjustments	Heating result refer to clause 15.2 of relevant models	P
(L.7)	**Short-circuit and overload protection**		**P**
	Comply with tests of clause 15 of IEC 61558-1 with adjustments	Heating result refer to clause 15.3 of relevant models	P
(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

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Between input- and output circuits not less than 5 MΩ ..... :	>500MΩ	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 ..... :	>500MΩ	P
(L.8.3)	Electric strength		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 having 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 ..... :		N/A
	d) live parts and an intermediate metal part ..... :		N/A
	e) intermediate metal parts and the body ..... :		N/A
	f) each input circuit and all other input circuits ... :		N/A
	3) Over reinforced insulation between the body and live parts ..... :	3000V	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		N/A
(L.10)	**Components**		**N/A**
	Protective devices comply with 20.6 – 20.11 of IEC 61558-1		N/A
(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
	c) measured values $\geq$ specified values (mm) ..... :		N/A
	2. Insulation between input and output circuits, double or reinforced insulation:		P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	a) measured values ≥ specified values (mm) ..... :	Between input and output: : cl:8,0mm>4,7mm cr:8,0m>5,0mm	P
	b) measured values ≥ specified values (mm) ..... :		N/A
	c) measured values ≥ specified values (mm) ..... :		P
	3. Insulation between adjacent input circuits		N/A
	- measured values ≥ specified values (mm) ..... :		N/A
	3. Insulation between adjacent output circuits		N/A
	- measured values ≥ specified values (mm) ..... :		N/A
	4. Insulation between terminals for external connection:		N/A
	- measured values ≥ specified values (mm) ..... :		N/A
	5. Basic or supplementary insulation:		P
	a) measured values ≥ specified values (mm) ..... :	Basic insulation of different polarity: cl:3,1mm>2,5mm cr:3,1mm>2,6mm	P
	b) measured values ≥ specified values (mm) ..... :		N/A
	c) measured values ≥ specified values (mm) ..... :		N/A
	d) measured values ≥ specified values (mm) ..... :		N/A
	e) measured values ≥ specified values (mm) ..... :		N/A
	6. Reinforced insulation or insulation:		N/A
	Between body and output circuit: measured values ≥ specified values (mm) ..... :	cl:6,0mm>4,7mm cr:6,0mm>5,0mm	P
	Between body and output circuit if provision against transient voltages: measured values ≥ specified values (mm) ..... :		N/A
	7. Distance through insulation:		P
	a) measured values ≥ specified values (mm) ..... :		N/A
	b) measured values ≥ specified values (mm) ..... :		N/A
	c) measured values ≥ specified values (mm) ..... :	1,0mm>0,9mm	P

(N)	**ANNEX N: REQUIREMENTS FOR INSULATION MATERIALS USED FOR DOUBLE OR REINFORCED INSULATION**		P
(N.4)	**General requirements**		**P**
(N.4.1)	Material comply with IEC 60085 and IEC 60216 series		P

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

(N.4.2)	**Solid insulation**		N/A
	Electric strength test at least 5 kV or 1,35 x test voltage in Table N.1		N/A
	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		N/A
	- 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		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**		**N/A**
(O.6)	**Marking**		**N/A**
	Marking according clause 7 (7)	See clause 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)	See clause 8	N/A
	Test finger not possible to make contact with basic insulated metal parts		N/A

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

(O.8)	**Terminals**		**N/A**
	Clause 9 (8)	See clause 9	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)	See clause 11	N/A
(O.11)	**Electric strength**		**N/A**
	Clause 12 (12)	See clause 12	N/A
(O.13)	**Fault conditions**		**N/A**
	Clause 14 (14)	See clause 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)	See clause 17	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)	See clause 18	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)	See clause 19	N/A
(O.17)	**Resistance to heat and fire**		**N/A**
	Clause 20 (18)	See clause 20	N/A
(O.18)	**Resistance to corrosion**		**N/A**

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Clause 21 (19)	See clause 21	N/A
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

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Comply with the requirements of 12 of IEC 62384		N/A
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

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

	ANNEX 1: Components	P

object/part No.	code	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity
Enclosure	B	BAYER THAI CO., LTD	2807+(z)(f1)	PC; V-2; 125°C	EN 61347-1 EN 61347-2-13	UL:E41613 (Test with appliance)
Alternative	D	BAYER THAI CO., LTD	6557+(z)(f1)	PC; V-2; 125°C	EN 61347-1 EN 61347-2-13	UL:E41613 (Test with appliance)
Alternative	D	BAYER THAI CO., LTD	6265+(z)(f1)	PC; V-0; 125°C	EN 61347-1 EN 61347-2-13	UL:E41613 (Test with appliance)
PCB	B	WALEX ELECTRONIC (WUXI) CO.,LTD	FR-4	V-0 or better, 130 °C	EN 61347-1 EN 61347-2-13	UL:E154355 (Test with appliance)
Alternative	D	KUNSHAN CITY SUYUAN ELECTRON CO., LTD	SY-3	V-0 or better, 130 °C	EN 61347-1 EN 61347-2-13	UL:E233870 (Test with appliance)
Alternative	D	LEUCHTEK ELECTRONICS (ZHEJIANG) CO., LTD	PFR-4	V-0 or better, 130 °C	EN 61347-1 EN 61347-2-13	UL:E199273 (Test with appliance)
CON1/CON2 (FOR SNP30-12/24VF-3)	B	DONGGUANSHI CHANGHE ELECTRONICS CO LTD	CA350-04-500	2.5-4.0mm²,250V/10A 110 °C	EN 60998-1 EN 60998-2-1	VDE:40021481
Alternative	D	PUTIAN HANJIANG FUCON ELECTRONICS CO LTD	CM200-5.0	0.5-1.5mm²,250V/10A 120°C	EN 60998-1 EN 60998-2-1	VDE:40022547
Alternative	D	Cixi Kaifeng Electronic Co., Ltd.	KF126	0,5 - 2,5 mm² ,250V/18A 105°C	EN 60998-1 EN 60998-2-1	VDE:40041233
Alternative	D	HEAVY POWER CO., LTD	PA001	0.5-1.5mm², 250V/17.5A 110 °C	EN 60998-1 EN 60998-2-1	VDE:40019265
Fuse F1	B	XC ELECTRONICS (SHENZHEN) CORP.LTD	5TE	AC 250V;1A	EN 60127-1 EN 60127-3	VDE:40029550

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

Alternative	D	Conquer Electronics Co.,Ltd	MST	AC 250V;1A	EN 60127-1 EN 60127-3	VDE:40017118
Alternative	D	walter Electronics Co.,Ltd	2010series	AC 250V;1A	EN 60127-1 EN 60127-3	VDE:40018781
Alternative	D	SUNNY EAST ENTERPRISE CO.,LTD	TSP	AC 250V;1A	EN 60127-1 EN 60127-3	VDE:40027173
X2 Capacitor (CX1)	B	FARATRONIC	MKP62	275VAC 0.15 uF T110	EN 60384-14	VDE:40000358
Alternative	D	DAIN ELECTRONICS CO., LTD	MPX	275VAC 0.15uF T110	EN 60384-14	VDE:40018798
Alternative	D	UITRA TECH XIPHI ENTERPRISE CO.,LTD	HQX	275VAC 0.15uF T100	EN 60384-14	VDE:40024534
Alternative	D	CARLI ELECTRONICS CO., LTD	MPX	275VAC 0.15uF T100	EN 60384-14	VDE:40008520
Alternative	D	KEMET ELECTRONICS CORPORATION	R.46	275VAC 0.15uF T110	EN 60384-14	ENEC:DAT97000141
Alternative	D	SHENZHEN CHUANGSHUODA ELECTRONICS CO.,LTD	MPX	275VAC 0.15uF T110	EN 60384-14	VDE:40037763
Alternative	D	ZHUHAI SUNG HO ELECTRONICS CO., LTD.	CMPP	275VAC 0.15uF T110	EN 60384-14	VDE:40026078
Y1 Capacitor (CY1)	B	JYA-NAY CO.,LTD.	JN	AC 400V;Y1;2200pF; T125	EN 60384-14	TUV:HN69242987
Alternative	D	MURATA MFG CO.,LTD	KX	AC 440V;Y1;2200pF; T125	EN 60384-14	VDE:40002831
Alternative	D	TDK	CD	AC 440V;Y1;2200pF; T125	EN 60384-14	VDE:40029780
Alternative	D	SUCCESS ELECTRONICS	SE	AC 500V;Y1;2200pF; T125	EN 60384-14	VDE:40020002

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

Bridge diode (BD1)	B	GALAXY SEMICONDUCTOR	TB10S	Min. 0.8A, 1000V	EN 61347-1 EN 61347-2-13	Test with appliance
Alternative	D	LITEON	TD10M	Min. 1A, 1000V	EN 61347-1 EN 61347-2-13	Test with appliance
Transformer (T2)(FOR 12V)	C	Ningbo Snappy Optoelectronics	SNP5.770.354	N1:25Ts(Φ0.35mmX1); N2: 5Ts(Φ0.7mmX1); N3: 6Ts(Φ0.14mmX3); N4:25Ts(Φ0.35mmX1);	EN 61347-1 EN 61347-2-13	Test with appliance
Transformer (T2)(FOR 24V)	C	Ningbo Snappy Optoelectronics	SNP5.770.355	N1:25Ts(Φ0.35mmX1); N2: 10Ts(Φ0.5mmX1); N3: 6Ts(Φ0.14mmX3); N4:25Ts(Φ0.35mmX1);	EN 61347-1 EN 61347-2-13	Test with appliance
Primary Wire	B	SHANDONG SAINT ELECTRIC CO., LTD	QA/130, QA/130 Litz MW75	130°C	EN 61347-1 EN 61347-2-13	UL E194410 (Test with appliance)
Triple insulation wire	B	SHANGHAI CHUANYE ELECTRONIC TECHNOLOGY CO.,LTD	GPX-B	130°C	EN 61347-1 EN 61347-2-13	UL E243712 (Test with appliance)
Alternative	D	TOTOKU ELECTRIC CO.,LTD	TIW-2X and TIW-2XY	130°C	EN 61347-1 EN 61347-2-13	UL E166483 (Test with appliance)
Alternative	D	GREAT LEOFLON INDUSTRIAL CO.,LTD	TRW(B)	130°C	EN 61347-1 EN 61347-2-13	UL E211989 (Test with appliance)
Varnish	B	SUZHOU TAIHU ELECTRIC ADVANCED MATERIAL CO.,LTD	T-4260(a)	130°C	EN 61347-1 EN 61347-2-13	UL E228349 (Test with appliance)
Bobbin	B	CHANG CHUN PLASTICS CO.,LTD	T375J	V-0, 150°C	EN 61347-1 EN 61347-2-13	UL E59481 (Test with appliance)

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

Insulating tape	B	JINGJIANG JINGYI ADHESIVE PRODUCT CO.,LTD	JY25-A(b)	130°C	EN 61347-1 EN 61347-2-13	UL E246950 (Test with appliance)
Teflon tube	B	GREAT HOLDING INDUSTRIAL CO.,LTD	TFL	150V 200°C VW-1	EN 61347-1 EN 61347-2-13	UL:E156256 (Test with appliance)
Heat shrinkable tube	B	SHENZHEN WOER HEAT-SHRINKABLE MATERIAL CO.,LTD	RSFR-H	600V; 125°C;VW-1	EN 61347-1 EN 61347-2-13	UL E203950 (Test with appliance)
Input cord (FOR SNP30-12/24VFP)	B	UNIRISE ELECTRIC WIRE&CABLE CO.,LTD	H05VVH2-F	2*1.0 mm²	EN 50525-2-11	VDE:40017449
Alternative	D	NINGBO XUANHUA ELECTRIC CO. LTD.	H05VVH2-F	2*1.0 mm²	VDE 0281-5*	VDE:40016531
Alternative	D	Shangyu Jintao Electron Co., Ltd.	H05VVH2-F	2*1.0 mm²	EN 50525-2-11	VDE:40013419
Alternative	D	New Square Company Ltd.	H05VVH2-F	2*1.0 mm²	EN 50525-2-11	VDE:116006
Alternative	D	Arditi CN Electric(Huizhou) Co., Ltd.	H05VVH2-F	2*1.0 mm²	VDE 0281-5*	VDE:40032075
Alternative	D	Hong Shan Chuan Industry (Shen Zhen) Co.,Ltd	H05VVH2-F	2*1.0 mm²	EN 50525-2-11	VDE:40037206
Output cord (FOR SNP30-12/24VFP)	B	UNIRISE ELECTRIC WIRE&CABLE CO.,LTD	H03VVH2-F	2*0.75 mm²	EN 50525-2-11	VDE:40017449
Alternative	D	NINGBO XUANHUA ELECTRIC CO. LTD.	H03VVH2-F	2*0.75 mm²	VDE 0281-5*	VDE:40016531
Alternative	D	Shangyu Jintao Electron Co., Ltd.	H03VVH2-F	2*0.75 mm²	EN 50525-2-11	VDE:40013419

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

Alternative	D	New Square Company Ltd.	H03VVH2-F	2*0.75 mm²	EN 50525-2-11	VDE:116006
Alternative	D	Arditi CN Electric(Huizhou) Co., Ltd.	H03VVH2-F	2*0.75 mm²	VDE 0281-5*	VDE:40032075
Alternative	D	Hong Shan Chuan Industry (Shen Zhen) Co.,Ltd	H03VVH2-F	2*0.75 mm²	EN 50525-2-11	VDE:40037206

Remark: * means test appliance with EN 61347-1 and EN 61347-2-13.

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) Certified by VDE	**P**

(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 (mm²)		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) .	M	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

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

	ANNEX 3: screwless terminals	**N/A**

(15)	**SCREWLESS TERMINALS**		**N/A**
(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
(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

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

(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										
	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

1.10 (5)	**ANNEX 4: EXTERNAL AND INTERNAL WIRING according to EN 60598-1**		**P**
1.10 (5.2)	Supply connection and external wiring		P
1.10 (5.2.1)	Means of connection..... :	Flexible cord	P
1.10 (5.2.2)	Type of cable ..... :	Refer to Annex 1	P
	Nominal cross-sectional area (mm²)..... :	Refer to Annex 1	P
	Cables equal to IEC 60227 or IEC 60245		N/A
1.10 (5.2.3)	Type of attachment, X, Y or Z	Z	P
1.10 (5.2.5)	Type Z not connected to screws		P
1.10 (5.2.6)	Cable entries:		P
	- suitable for introduction		P
	- adequate degree of protection		P
1.10 (5.2.7)	Cable entries through rigid material have rounded edges		P
1.10 (5.2.8)	Insulating bushings:		N/A
	- suitably fixed		N/A
	- material in bushings		N/A
	- material not likely to deteriorate		N/A
	- tubes or guards made of insulating material		N/A
1.10 (5.2.9)	Locking of screwed bushings		N/A
1.10 (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
1.10 (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
	f) metal screw not directly on cable		N/A
	g) replacement without special tool		N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Glands not used as anchorage		N/A
	Labyrinth type anchorages		N/A
1.10 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		P
1.10 (5.2.10.3)	Tests:		P
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N) ..... :	60N 2,0mm^2	P
	- torque test: torque (Nm) ..... :	0,25Nm	P
	- displacement ≤ 2 mm		P
	- no movement of conductors		P
	- no damage of cable or cord		P
1.10 (5.2.11)	External wiring passing into luminaire		N/A
1.10 (5.2.12)	Looping-in terminals		N/A
1.10 (5.2.13)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		N/A
1.10 (5.2.14)	Mains plug same protection		N/A
	Class III luminaire plug		N/A
1.10 (5.2.16)	Appliance inlets (IEC 60320)		N/A
	Appliance couplers of class II type		N/A
1.10 (5.2.17)	No standardized interconnecting cables properly assembled		N/A
1.10 (5.2.18)	Used plug in accordance with		N/A
	- IEC 60083		N/A
	- other standard		N/A
1.10 (5.3)	Internal wiring		N/A
1.10 (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
	- temperatures ..... :	(see Annex 2)	N/A
	Green-yellow for earth only		N/A
1.10 (5.3.1.1)	Internal wiring connected directly to fixed wiring		N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Cross-sectional area (mm²) ..... :		N/A
	Insulation thickness		N/A
	Extra insulation added where necessary		N/A
1.10 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		N/A
	Adequate cross-sectional area and insulation thickness		N/A
1.10 (5.3.1.3)	Double or reinforced insulation for class II		N/A
1.10 (5.3.1.4)	Conductors without insulation		N/A
1.10 (5.3.1.5)	SELV current-carrying parts		N/A
1.10 (5.3.1.6)	Insulation thickness other than PVC or rubber		N/A
1.10 (5.3.2)	Sharp edges etc.		N/A
	No moving parts of switches etc.		N/A
	Joints, raising/lowering devices		N/A
	Telescopic tubes etc.		N/A
	No twisting over 360°		N/A
1.10 (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
1.10 (5.3.4)	Joints and junctions effectively insulated		N/A
1.10 (5.3.5)	Strain on internal wiring		N/A
1.10 (5.3.6)	Wire carriers		N/A
1.10 (5.3.7)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		N/A

1.13 (9)	**RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE**		**P**
1.13 (-)	If IP > IP 20 the order of the test specified in clause 1,12		—
1.13 (9.2)	Tests for ingress of dust, solid objects and moisture:		P
	- classification according to IP ..... :	IP44 for SNP30-12VFP and SNP30-24VFP	—
	- mounting position during test ..... :	As stated in user manual	—
	- fixing screws tightened; torque (Nm) ..... :		—

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	- tests according to clauses ..... :	Cl 9.2.0 & Cl 9.2.5	—
	- electric strength test afterwards		P
	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		P
	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)		P
	f) no contact with live parts (IP3X and IP4X)		P
	g) no trace of water on part of lamp requiring protection from splashing water		P
	h) no damage of protective shield or glass envelope		N/A
1.13 (9.3)	Humidity test 48 h	93%, 25°C	P

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

Appendix 1: Temperature Measurements for MM Mark (VDE 0710 Part 14/04.82)			P
	Type reference .....:	SNP30-12VFP	—
	Lamp used .....:	LED power supply	—
	Mounting position.....:	On black plywood	—
	Calculated power factor.....:	N/A	—
	Table: measured temperatures corrected for ta = 50°C:		—
	Test 1: Normal Operation,1,06 times rated voltage:	1,1 times:264V	—
	Test 2: Abnormal Operation, from 1.1times rated voltage, increase the voltage in steps of 5% rated voltage until the output off	409,5V	—

Temperature (°C) of Part	Normal		Abnormal	
	Test 1	Limit	Test2	Limit
Mounting surface	63,1	95	62,5	115
Top surface	68,7	95	69,2	115
Side surface	87,5	95	87,7	115
Primary winding	92,9	--	93,1	--
Ambient temperature	45,6	--	45,6	--

Remarks: N/A

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

ATTACHMENT TO TEST REPORT IEC 61347-2-13 EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES Part 2: Particular requirements Section Thirteen – 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 .....:	IMQ SpA
Master Attachment.....:	Date 2015-03

	CENELEC COMMON MODIFICATIONS (EN)	P
	No Common modifications	**P**

Deviation test report according EN 61347-1:2015 to EN 61347-1:2008+A1+A2 as below:

5	**General notes on tests**		P
5.8	Add: Where the terms "voltage" and "current" are used, they imply the r.m.s. values unless otherwise stated.		P

7	**Marking**		P
7.1 k)	Add: For controllable controlgear, control terminals shall be identified in the manufacturer catalogue or similar. The classification of insulation that has been maintained between live parts and control circuits shall be provided. E.g. basic insulation, reinforced insulation. Maintenance of the declared insulation barrier may also be dependent on other external components/products connected to the same control bus. This is the responsibility of the control system designer, not the controlgear manufacturer.		N/A

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

v)	Declaration of the maximum equivalent output peak voltage *U*p between: • output terminals; • any output terminal and earth, if applicable.		N/A
w)	If the creepage distance values of the Table 8 of this standard have to be used and creepage distance is greater than the related creepage distances of Table 7, the maximum output peak voltage *Û*out and its corresponding frequency *f*Uout between: • output terminals; • any output terminal and earth, if applicable, shall be declared.		N/A
14	**Fault conditions**		P
14.1	Replace clause 14: 6th,7th and 8th by: The intention of Clause 14 is to check if the controlgear remains safe if a single fault occurs in the controlgear. With this test, evidence will be given that the controlgear will be safe under any single fault condition.		P

15	**Construction**		
15.4	**Add:** **Insulation between circuits and accessible parts**		**P**
15.4.1	Controlgear shall provide suitable insulation between different electrical circuits and to accessible parts.		P
	The same requirements apply to the circuits connected to the control interface of a controllable electronic controlgear where the control circuits shall be isolated from the LV supply according to the declaration of the controlgear manufacturer (see 7.1 k)).		N/A
	No insulation is required where:		N/A
	– control signals are injected via the supply terminals or circuits connected to the supply via a separate terminal;		N/A
	– control signal receiver is located in the ballast case and the signal is transmitted remotely via infra-red or radio wave transmitters;		N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	– control terminals are only to be used together with one sensing device outside of the controlgear case, but inside the luminaire (not remotely).		N/A
15.4.2	**SELV circuits**		**P**
	The following sources may be used to supply SELV circuits:		P
	– a safety isolating transformer in accordance with IEC 61558-2-6 or equivalent Part 2 of IEC 61558;		P
	– a controlgear providing SELV in accordance with IEC 61347-2-2, IEC 61347-2-3, IEC 61347-2-7, IEC 61347-2-13;		P
	– an electrochemical source (e.g. a battery) or another source independent of a higher voltage circuit.		N/A
	The voltage in the circuits shall not be higher than the limits defined for ELV.		P
	SELV circuits shall be insulated from the LV supply by double or reinforced insulation (based upon a working voltage across the insulation).		P
	SELV circuits shall be insulated from other non SELV circuits (except FELV) by double or reinforced insulation (based upon a working voltage equal to highest voltage in the circuits).		N/A
	SELV circuits shall be insulated from FELV circuits by supplementary insulation (based upon a working voltage equal to LV supply voltage).		N/A
	SELV circuits shall be insulated from other SELV circuits by basic insulation (based upon a working voltage equal to highest voltage in the circuits).		N/A
	SELV circuits shall be insulated from accessible conductive parts by insulation according to Table 6 in 15.4.5.		P
	In cases of a controlgear providing SELV according to this standard, the SELV voltage shall be considered for insulating purpose as the maximum output voltage indicated as “UOUT”		P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Compliance is checked by inspection and by the tests required in Clause 10, 11, 12 and 16 of this standard.		P
15.4.3	**FELV circuits**		N/A
	The following sources may be used to supply FELV circuits:		N/A
	– a separating transformer in accordance with IEC 61558-2-1 or equivalent Part 2 of IEC 61558		N/A
	– a separating controlgear providing basic insulation between input and output circuits in accordance with the relevant Part 2 of this standard		N/A
	– an electrochemical source (e.g. a battery) or another source in circuit separated by the LV supply by basic insulation only.		N/A
	The voltage in the circuits shall not be higher than the limits defined for ELV.		N/A
	FELV circuits shall be insulated from the LV supply by at least basic insulation (based upon a working voltage equal to LV supply voltage).		N/A
	It is not required that FELV circuits shall be insulated from other FELV circuits except for functional purpose.		N/A
	FELV circuits shall be insulated from accessible conductive parts by an insulation according to Table 6 in 15.4.5.		N/A
	Compliance is checked by inspection and by the tests required in Clause 10, 11, 12 and 16 o this standard.		N/A
	Plugs and socket-outlets for FELV systems shall comply with the following requirements:		N/A
	– plugs shall not be able to enter socket-outlets of other voltage systems;		N/A
	– socket-outlets shall not admit plugs of other voltage systems;		N/A
	– socket-outlets shall have a protective conductor contact.		N/A
15.4.4	**Other circuits**		N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	The insulation between circuits other than SELV or FELV and accessible conductive parts shall be in accordance with the requirements in Table 6 of 15.4.5.		N/A
	Compliance is checked by applying the requirements of this standard to the insulation required in 15.4.5.		N/A
15.4.5	**Insulation between circuits and accessible conductive parts**		**P**
	Accessible conductive parts shall be insulated from active parts of electric circuit by an insulation according to Table 6. Figure 3 gives an example of a controlgear insulation related to explanation in Table 6.		**P**
	In class II construction, where equipotential bonding is used for the protection against indirect contacts with live parts, the following requirements are applicable.		**N/A**
	– All conductive parts are connected together so that two failures of the insulation result in a short circuit.		N/A
	– To check whether the conductive parts are reliably connected together, the test of IEC 60598-1:2014, 7.2.3 (earth continuity test with 10 A) has to be carried out.		N/A
	– The conductive parts comply with the requirements of Annex A of this standard in case of insulation fault between live parts and accessible conductive parts.		P
16	**Creepage distances and clearances**		P
	Replace 1st-7st paragraph: This clause specifies minimum requirements for creepage distances (see 16.2) and clearances (see 16.3) for lamp controlgear. Exemptions are only specified in Clause 14. Additional requirements for SELV are given in Annex L.		P
	The requirements for creepage distances and clearances have to be applied:		P
	for basic insulation:		P
	– between live parts of different polarity		P
	– between live parts and accessible earthed metal parts		N/A
	– between circuits requiring isolation from each other (e.g. FELV circuits)		N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	– between accessible conductive parts and a metal rod of the same diameter as the flexible cable or cord (or a metal foil wrapped around the cord) inserted inside inlet bushing, anchorage and the like		N/A
	– between live part and an intermediate conductive part		N/A
	– between an intermediate conductive part and the body		N/A
	for double or reinforced insulation:		P
	– for lamp controlgear declared not to rely on the luminaire enclosure for protection against electric shock – between live parts and the outer accessible surface of insulating parts		P
	– between live parts and accessible unearthed metal parts		N/A
	– between circuits requiring isolation from each other (e.g. SELV circuits).		P
	Add: Reductions for creepage distances and clearances are allowed for lamp controlgear which are protected against pollution by the use of coating or potting. In this case pollution degree 1 applies.		N/A
	The minimum dimensions and verification tests are given in Annex P.		N/A
	Creepage distances and clearances shall be measured on uncoated products.		P
	Distances which provide basic insulation for the same circuit between live parts of different polarities on printed circuit boards are exempt from the requirements of this subclause, because they are tested according to Clause 14.		P
	Values for creepage distances and clearance given in this subclause are the absolute minimum. Exemptions for PCB are given in Clause 14.		P
	For details of pollution degrees or impulse withstand categories, IEC 60664-1 should be consulted.		P
16.2	**Creepage distances**		P
16.2.1	**General**		P

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

	The minimum values for creepage distances are listed in Tables 7 and 8.		P
	For the dimensioning of the creepage distances the r.m.s. values of the working voltage (Table 7) shall be taken into account.		P
	For working voltages with higher operating frequencies than 30 kHz, additionally the peak values of the working voltages (Table 8) shall be taken into account. For such kind of working voltages (with frequencies above 30 kHz) both Tables 7 and 8 shall be applied.		P
16.2.2	**Minimum creepage distances for working voltages**		P
	Table 7 defines the minimum creepage distance values for working voltages		P
	Basic or supplementary insulation……:	Between different polarity: cr:3,1mm>2,5mm Under fuse:cr3,1mm>2,5mm	P
	Reinforced insulation……..:	Between primary circuit and secondary circuit: cr: 8,0 m>7,5mm	P
16.2.3	**Creepage distances for working voltages with frequencies above 30 kHz**		N/A
	Table 8 presents creepage distance values for working voltages with frequencies above 30 kHz for all insulation materials (except for glass, ceramic or other inorganic materials, which do not track) – there is no distinction into different PTI classes.		N/A
	Basic or supplementary insulation……:		N/A
	Reinforced insulation……..:		N/A
16.2.4	**Compliance with the required creepage distances**		P
	Compliance is checked by measurements made with and without conductors of the largest section connected to the terminals of the controlgear.		P
	For controlgear provided with an appliance inlet, the measurements are made with an appropriate connector inserted.		N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Distances through slots or openings in external parts of insulating material are measured with metal foil in contact with the accessible surface. The foil is pushed into corners and similar places by means of the standard test finger specified in IEC 60529, but it is not pressed into openings.		N/A
	Creepage distances at a supply terminal shall be measured from the live part in the terminal to any accessible metal parts.		N/A
	When creepage distances are determined at bushings, cord anchorages, wire carriers or clips, the measurement shall be made with the cable fitted.		N/A
16.3	**clearances**		P
16.3.1	**General**		P
	The minimum values for clearances are listed in Tables 9, 10 and 11. The values for clearances are divided into categories for basic or supplementary and reinforced insulation.		P
16.3.2	**Clearances for working voltages**		P
	Table 9 presents clearance values for working voltages		P
	Clearance with mains supply transients according impulse withstand category II -Basic or supplementary insulation -Reinforced insulation	Basic insulation: 3,1mm>3mm Reinforced insulation: 8,0mm>5,5mm	P
	Clearance without mains supply transients -Basic or supplementary insulation -Reinforced insulation		N/A
16.3.3	**Clearances for ignition voltages and working voltages with higher frequencies**		P
	Minimum distances for sinusoidal or non-sinusoidal ignition voltages or working voltages with higher frequencies are given in Table 10 for basic or supplementary insulation and in Table 11 for reinforced insulation.		P
	Table 10 for basic or supplementary insulation		N/A
	Colum A Transients or ignition pulse voltage ≤ 0,75 ms within 10 ms		N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Colum B Ignition voltage or working voltage $f \leq f_{crit}$		N/A
	Colum C Ignition voltage or working voltage $f \leq$ 200KHz		N/A
	Colum D Ignition voltage or working voltage 200KHz $\leq f \leq$ 400KHz		N/A
	Colum E Ignition voltage or working voltage 400KHz $\leq f \leq$ 700KHz		N/A
	Table 11 for reinforced insulation.		P
	Colum A Transients or ignition pulse voltage ≤ 0,75 ms within 10 ms		N/A
	Colum B Ignition voltage or working voltage $f \leq f_{crit}$	8,0mm>0,1mm @0,5kV @5,6Hz	P
	Colum C Ignition voltage or working voltage $f \leq$ 200KHz		N/A
	Colum D Ignition voltage or working voltage 200KHz $\leq f \leq$ 400KHz		N/A
	Colum E Ignition voltage or working voltage 400KHz $\leq f \leq$ 700KHz		N/A
16.3.4	**Compliance with the required clearances**		P
	Compliance is checked by measurements made with and without conductors of the largest section connected to the terminals of the lamp controlgear.		P
	For controlgear provided with an appliance inlet, the measurements are made with an appropriate connector inserted.		N/A
	Distances through slots or openings in external parts of insulating material are measured with metal foil in contact with the accessible surface. The foil is pushed into corners and similar places by means of the standard test finger specified in IEC 60529, but it is not pressed into openings.		N/A
	At the internal wiring side of the terminal, the clearance shall be measured between live parts of the terminal and accessible metal parts (see Figure 24 of IEC 60598-1:2014).		N/A

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

Annex A	**Test to establish whether a conductive part is a live part which may cause an electric shock**		P
Add	if no explicit designation of the supply voltage polarity is marked on the DUT, the test is done with both supply voltage polarities;		P

Annex L	**Particular additional requirements for controlgears providing SELV**		P
L.11	**Creepage distances, clearances and distances through insulation**		P
	Creepage distances and clearances shall be not less than the values shown in Clause 16.		P
	For distances through insulation Table L.5 shall apply.		P

Annex P	**Creepage distances and clearances and distance through isolation (DTI) for lamp controlgear which are protected against pollution by the use of coating or potting**		P
P.1	**General**		P
	If the unpotted/uncoated sample of the controlgear complies with Clause 16, the controlgear is treated like an unspotted/uncoated controlgear.		P
	If the creepage distance is less than the minimum distance according to Tables 7 and 8, Clause P.2 of this annex applies.		N/A
	If the clearance of the unpotted/uncoated sample is less than the minimum distance according to Tables 9, 10 and 11, Clause P.3 of this annex applies.		N/A
P.2	**Creepage distances**		N/A
P.2.1	**General**		N/A
	Creepage distances for lamp controlgear which are protected against pollution by the use of coating or potting may be reduced to the minimum values as given in P.2.2 or P.2.3, under the condition that the lamp controlgear complies with the tests of P.2.4.		N/A
P.2.2	**Minimum creepage distances for working voltages and rated voltage with frequencies up to 30 kHz**		N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Table P.1 defines the minimum creepage distance values for working voltages and rated voltages with frequencies up to 30 kHz for all insulating materials. There is no distinction into different PTI classes.		N/A
P.2.3	**Creepage distances for working voltages with frequencies above 30 kHz**		N/A
	Table P.2 defines the minimum creepage distance values for working voltages with frequencies above 30 kHz for all insulation materials (except for glass, ceramic or other inorganic materials, which do not track). There is no distinction into different PTI classes.		N/A
	For working voltages with frequencies above 30 kHz the peak value of the voltage shall be considered, because partial discharges damage the surfaces and may cause tracking.		N/A
P.2.4	**Compliance with the required creepage distances**		N/A
P.2.4.1	**General**		N/A
	Compliance is checked in accordance with 16.3.3 and by performing the tests of P.2.4.2.		N/A
P.2.4.2.	**Preconditioning of the lamp control gear**		N/A
P.2.4.2.1	**Rapid change of temperature**		N/A
	The rapid change of temperature conditioning is in accordance with test Na of IEC 60068-2-14. The minimum temperature is set at –10 °C and the maximum temperature is set at + 125 °C.		N/A
	The conditioning is carried out as follows: • duration of one cycle 1 h (30 min ± 2 min at each temperature) • rate of change of temperature within 30 s • number of cycles: 5		N/A
P.2.4.2.2	**Moisture resistance**		N/A
	The lamp controlgear is placed in the most unfavourable position of normal use, in a humidity cabinet containing air with a relative humidity maintained between 91 % and 95 %. The temperature of the air at all places where samples can be located shall be maintained within 1 °C of any convenient value t between 20 °C and 30 °C.		N/A

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

P.2.4.3	**Electrical tests after conditioning**		N/A
P.2.4.3.1	**Insulation resistance and electric strength**		N/A
	Immediately after the preconditioning the specimens are subjected to the insulation resistance and electric strength tests according to Clause 11 and 12.		N/A
P.3	**Distance through isolation**		N/A
P.3.1	**General**		N/A
	Clearances do not exist within lamp controlgear which is protected against pollution by the use of coating or potting. Therefore, no clearance values are required.		N/A
	The insulation should be considered as solid insulation and shall comply with the requirements for distances through insulation and shall be tested in accordance with the tests of P.3.2.		N/A
	The tests are conducted on three additional specimens, which have not been used for any other test. No failure of any specimen under test is permitted.		N/A
P.3.2	**Compliance tests**		N/A
	The suitability of protection is evaluated by carrying out all the tests described in P.3.4 immediately after the conditioning described in P.3.3.		N/A
	The tests are conducted on three specimens, which have not been used for any other test. No failure of any specimen under test is permitted.		N/A
P.3.3	**Preconditioning of the lamp controlgear**		N/A
P.3.3.1	**Rapid change of temperature**		N/A
	The rapid change of temperature conditioning is in accordance with test Na of IEC 60068-2-14. The minimum temperature is set at –10 °C and the maximum temperature is set at +125 °C.		N/A

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

	The conditioning is carried out as follows: • duration of one cycle 1 h (30 min ± 2 min at each temperature) • rate of change of temperature within 30 s • number of cycles: 5		N/A
P.3.3.2	**Moisture resistance**		N/A
	The lamp controlgear is placed in the most unfavorable position of normal use, in a humidity cabinet containing air with a relative humidity maintained between 91 % and 95 %. The temperature of the air at all places where samples can be located shall be maintained within 1 °C of any convenient value t between 20 °C and 30 °C.		N/A
P.3.4	**Electrical tests after conditioning**		N/A
P.3.4.1	**Insulation resistance and electric strength**		N/A
	Immediately after the preconditioning the specimens are subjected to the insulation resistance and electric strength tests according to Clause 11 and 12.		N/A
P.3.4.2	**Impulse voltage dielectric test**		N/A
	The purpose of this test is to verify that clearances will withstand specified transient overvoltages.		N/A
	The impulse withstand test is carried out with a voltage having a 1,2/50 ms waveform with the values specified in Table P.3 between the insulation barrier where the clearance reduction has been applied, input/output terminals short-circuited and the body.		N/A
	The test shall be conducted for five impulses of each polarity with an interval of at least 1 s between pulses in the following conditions.		N/A
	No puncture or partial breakdown of solid insulation shall occur during the test, but partial discharges are allowed.		N/A

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

Annex Q	**Example for Up calculation**		N/A
	In this Annex Q, an example for the calculation of the Up value is given.		N/A

Annex R	**Concept of creepage distances and clearances**		P
R.1	Basic concept considerations		P
R.1.1	Creepage distances		P
	For creepage distances r.m.s. voltages are normally considered and pulse voltages like transients are disregarded. In case of voltages with more than 30 kHz frequency however, according to IEC 60664-4, the peak values of the voltage together with the frequency should be considered. Therefore Table 8 was created according to Table 2 in IEC 60664-4:2005.		P
R.1.2	**Clearances**		P
	The withstand voltage of a clearance is influenced by the shape of the electric field. IEC 60664-1 distinguishes only homogeneous field (two balls of 1 m diameter) and inhomogeneous field (needle of 30 mm against plane of 1 m × 1 m).		P
	According to IEC 60664-4 the withstand voltage of a clearance is reduced when the frequency of this voltage is increased above a critical value.		P
	a) Homogeneous field conditions		N/A
	b) Inhomogeneous field condition		P
	c) Practical field condition		N/A

Annex S	**Examples of controlgear insulation coordination**		P
	The controlgear insulation coordination should be considered together with the application.		P
	Dependent on the protection against electric shock are independent controlgear available as class I (cl I), class II (cl II) or class III (cl III) units (for the definition see IEC 60598-1).		P

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

Annex T	**Creepage distances and clearances for controlgear with a higher degree of availability (impulse withstand category III)**		N/A
T.1	**General**		N/A
	This informative annex details the more onerous requirements of IEC 60664 which would allow controlgear to have a higher over-voltage capability for an impulse withstand category III should a higher degree of impulse withstand category be requested.		N/A
T.2	**Clearances for working voltages of lamp controlgear not protected against pollution by coating or potting materials**		N/A
	Requirements for impulse withstand category III are given in the Table T.1. These limits are applied in place of those given in Table 9 of this standard should a rating of impulse withstand category III be requested.		N/A
T.3	**Clearances for working voltages of lamp controlgear protected against pollution by coating or potting**		N/A
	The impulse withstand test voltages for impulse withstand category III are given in Tables T.2. These impulse withstand test voltages are applied in place of those given in Table P.3 of this standard should a rating of impulse withstand category III be requested. In other respects the requirements of Clause P.3 apply.		N/A
T.4	**Distances through insulation – Particular additional requirements forcontrolgear providing SELV**		N/A
	Requirements for impulse withstand category III are given in the Table T.3 these limits are applied in place of those given in Table L.5 of this standard should a rating of impulse withstand category III be requested.		N/A

<End of the report>

TÜV Rheinland/CCIC(Ningbo)Co.,Ltd.

TÜVRheinland®

Measuring and Testing Equipment List

Used MTE

Report Number: 147173110001

Description	MTE Type/model	Internal ID	Next Calibration (DD/MM/YY)
[X] Digital Power Meter	WT200 12B921862	1.001	11/10/2016
[X] Withstanding Voltage Tester	TOS5051	1.006	11/10/2016
[X] Earth continuity Test	TOS6200	1.007	11/10/2016
[X] Leakage current tester	LMT03990	1.013B	8/2/2016
[X] Glow Wire Test Apparatus	F3-3020	1.014A	11/10/2016
[X] Tracking Test Apparatus	TI-VI	1.015	4/3/2016
[X] Needle Flame Test Apparatus	NF-II	1.016	4/3/2016
[X] Climate Chamber	ITH-408-40-IP	1.022	6/5/2016
[X] Hybrid Recorder	DX230-3-2 S5G508756	1.030A	11/10/2016
[X] Oscilloscope	TDS3012B	1.032	22/5/2016
[X] Ball pressure tester	SHQK	1.035A	31/5/2018
[X] Spring impact hammer	F 22.50 5021350	1.037	10/11/2016
[X] Torque screw driver	RTD260CN 423281R	1.040	2/11/2017
[X] Electronic scale	T-1000 1000g	1.052B	4/3/2016
[X] High voltage probe	P-5200	1.055A	12/8/2016
[X] DC/AC current probe for Oscilloscope	A622	1.055E	20/01/2016
[X] Digital Display Caliper	0~150mm 1111B33861	1.063F	13/10/2016
[X] Micrometer	F786	1.099B	8/3/2016
[X] Madrel Apparatus	EN61558-1:26.3	1.134	3/2/2016
[X] 50K Ohm nonductive resistor	50KΩ	1.165B	20/3/2017

Signature:

Date: 2015-12-4

TÜV Rheinland/CCIC(Ningbo)Co.,Ltd.

TÜVRheinland®

Measuring and Testing Equipment List

Used MTE

Report Number: 147173110001

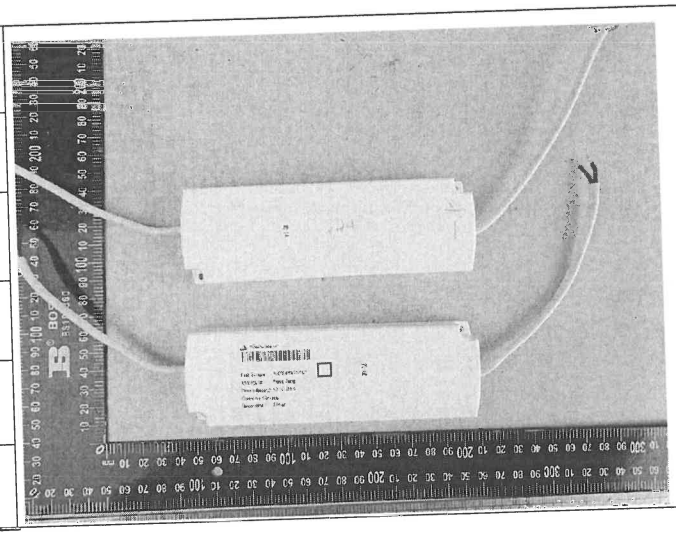
Description	MTE Type/model	Internal ID	Next Calibration (DD/MM/YY)
[x] Temp. & Humidity recorder	175H1	1.217	4/6/2016
[x] Power cord pulling and torsion tester	DMS702	1.317	23/03/2018
[x] Oven	1040121208 ST-120B1	1.384	6/5/2016
[x] Electronic Load	IT8722	1.604	11/10/2016

Signature:

Date: 2015-12-31

Prüfbericht - Nr.: *Test Report No.:*	**14717506 001**	**Auftrags-Nr.:** *Order No:*	1160019957	Seite 1 von 10 *Page 1 of 10*
Kunden-Referenz-Nr.: *Client Reference No.:*	448574	**Auftragsdatum:** *Order date:*	02.11.2015	
Auftraggeber: *Client:*	Ningbo Snappy Optoelectronics Co., Ltd. No.56, Keda Road, National Hi-tech park of Ningbo, Zhejiang 315040 P.R. China			
Prüfgegenstand: *Test item:*	LED Power Supply			
Bezeichnung / Typ-Nr. : *Identification / Type No. :*	SNP30-12VFP, SNP30-24VFP, SNP30-12VF-3, SNP30-24VF-3			
Auftrags-Inhalt: *Order content:*	TÜV Rheinland – EMC Service			
Prüfgrundlage: *Test specification:*	**EN 62493: 2010**			

Wareneingangsdatum: *Date of receipt:*	10.11.2015
Prüfmuster-Nr.: *Test sample No.:*	N/A
Prüfzeitraum: *Testing period:*	10.11.2015-13.11.2015
Ort der Prüfung: *Place of testing:*	Refer to section 1.1
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland / CCIC (Ningbo) Co., Ltd.
Prüfergebnis*: *Test result*:*	Pass



geprüft von/ *tested by:*

Datum *Date*	Name/Stellung *Name/Position*	Unterschrift *Signature*
15.01.2016	Feng Liang/PE	

kontrolliert von/ *reviewed by:*

Datum *Date*	Name/Stellung *Name/Position*	Unterschrift *Signature*
15.01.2016	Stone Hou/TC	

Sonstiges/ *Other:*

In electrical characteristics, the models listed above are similar and have been EMC approved in test report 14717505 001. Therefore Induced current density test according to EN62493 was performed on model SNP30-12VFP.

Zustand des Prüfgegenstandes bei Anlieferung: *Condition of the test item at delivery :*	Prüfmuster vollständig und unbeschädigt *Test item complete and undamaged*

*Legende:	1= Sehr gut	2 = gut	3= befriedigend	4= ausreichend	5 = mangelhaft
	P(ass) =entspricht o.g. Prüfgrundlage(n)		F(ail)= entspricht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T =nicht getestet
Legend:	*1= very good*	*2 = good*	*3= satisfactory*	*4= sufficient*	*5 = poor*
	P(ass) = passed a.m. test specification(s)		*F(ail)= failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

TEST SUMMARY

4.1 DISTURBANCE VOLTAGE AT MAINS TERMINAL (20KHZ-30MHZ)
Result:
Pass

4.2 RADIATED ELECTROMAGNETIC DISTURBANCES (100KHZ-30MHZ)
Result:
Pass

4.3 RADIATED ELECTROMAGNETIC DISTURBANCES (30-300MHZ)
Result:
Pass

4.4 INDUCED CURRENT DENSITY DUE TO THE ELECTRIC FIELD (20KHZ-10MHZ)
Result:
Pass

Contents

1 Test Sites

1.1 Test Facilities

Laboratory: Ningbo Entry-Exit Inspection and Quarantine Bureau
Electrical Safety Testing Center for Optics&Electronics products (NOETC)

5-9 Zhufeng Road, Ningbo Export Processing Zone, Beilun Ningbo, Zhejiang province, 315800, P. R. China

The used test equipment is in accordance with CISPR 16-1 series standards for measurement of radio interference.
The tests were conducted by TÜV Rheinland/CCIC's engineer directly in the above laboratory.

1.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment of Laboratory

No.	Equipment	Model	Serial No.	Cal. due date
1	EMI test receiver	ESCI	100708	2016.04.28
2	Van der Hoofden Test-Head	VDHH9502	030	2016.04.28

2 General Product Information

2.1 Product Function and Intended Use

The EUT (equipment under test) is an ordinary LED Power Supply for lighting and similar use. For the further information, refer to the user's manual.

2.2 Ratings and System Details

Rated Voltage	:	AC 200-240V, 50/60Hz	For all models
Rated Output	:	DC 12V, Max. 2.5A	For SNP30-12VFP and SNP30-12VFP-3
		DC 24V, Max. 1.25A	For SNP30-24VFP and SNP30-24VFP-3

2.3 Independent Operation Modes

The basic operation modes are: "On" or "Off".

2.4 Submitted Documents

None.

3 Test Set-up and Operation Modes

3.1 Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its highest possible emission level. The test conditions were adapted accordingly in reference to the instructions for use.

Refer to the related paragraph of this report.

3.2 Physical Configuration for Testing

Refer to the related paragraph of this report.

3.3 Test Operation and Test Software

Refer to the related paragraph of this report. No software was used.

3.4 Special Accessories and Auxiliary Equipment

None.

4 Test Results

4.1 Disturbance Voltage at Mains Terminal (20kHz-30MHz)

Result:	**Pass**

The models have been EMC approved as described in test report 14717505 001.
Therefore the models were deemed to meet the requirement of disturbance voltage at mains terminal (20kHz-30MHz) without additional test.

4.2 Radiated Electromagnetic Disturbances (100kHz-30MHz)

Result:	**Pass**

The models have been EMC approved as described in test report 14717505 001.
Therefore the models were deemed to meet the requirement of radiated electromagnetic disturbance (100kHz-30MHz) without additional test.

4.3 Radiated Electromagnetic Disturbances (30-300MHz)

Result:	**Pass**

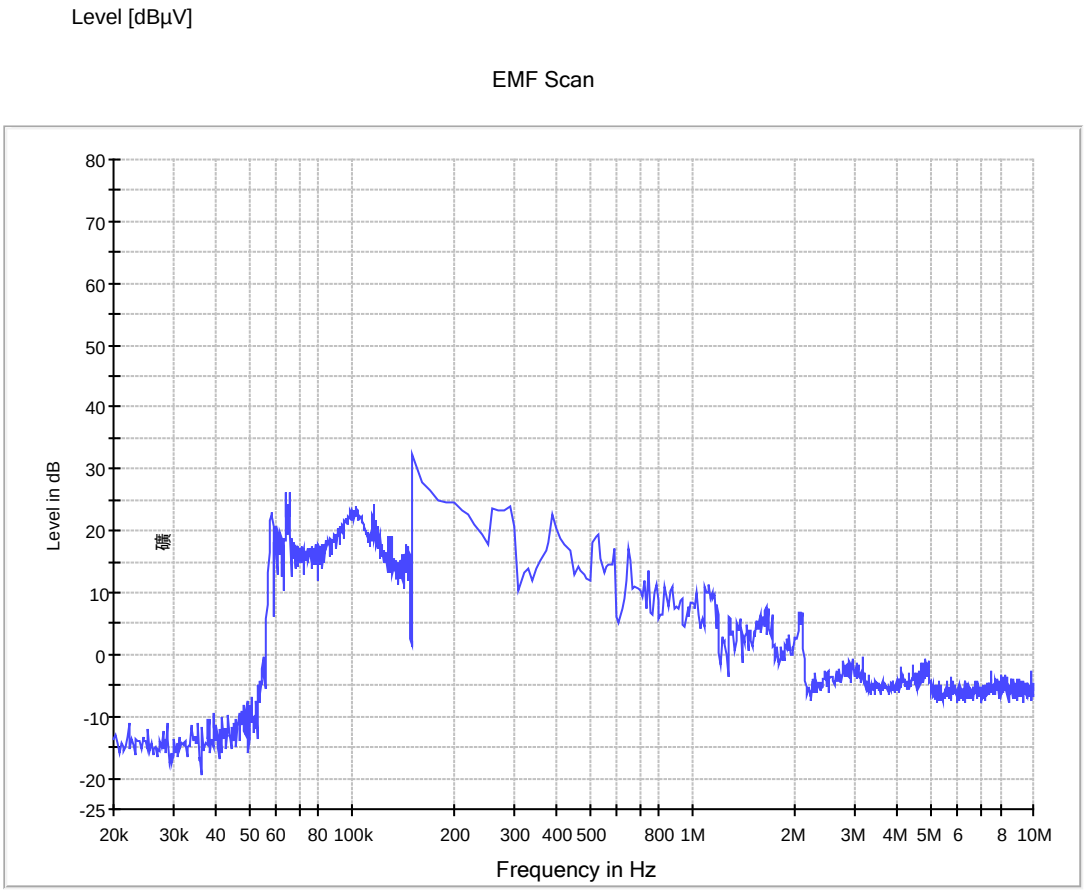
The models have been EMC approved as described in test report 14717505 001.
Therefore the models were deemed to meet the requirement of radiated electromagnetic disturbance (30-300MHz) without additional test.

4.4 Induced Current Density due to the Electric Field (20kHz-10MHz)

Result:	**Pass**

Test date	:	2015.12.15
Test procedure	:	EN 62493:2010
Frequency range	:	20kHz-10MHz
Test voltage	:	AC 200-240V, 50/60Hz
Measuring distance	:	50cm
Test-head location	:	Figure B.2, Annex B, EN 62493:2010
Operating condition	:	Continuous operation at least 30min. before test
Ambient temperature	:	23°C
Measurement uncertainty (U)	:	45%
Limit	:	The factor (F) ≤ 0.85
Measurement result	:	F = 0.079

Figure 1: Spectral diagram of induced current density measurement



5 Photographs of the Test Set-Up

Photograph 1: Set-up for measurement of induced current density due to the electric field (20kHz-10MHz)

6 List of Tables

7 List of Figures

8 List of Photographs