TEST REPORT
IEC 62031
LED modules for general lighting – Safety specifications

Report Number. .....:	LCSB030323033S
Date of issue .....:	March 21, 2023
Total number of pages.....	31 pages
Name of Testing Laboratory preparing the Report.....:	**Shenzhen LCS Compliance Testing Laboratory Ltd.**
Applicant's name.....:	**Shenzhen Shangpin Youbo Technology Co., Ltd**
Address .....:	102, Building D, Baoying Industrial Zone, Longxi Community, Longgang Street, Longgang District, Shenzhen City, Guangdong Province
Test specification:	
Standard.....:	IEC 62031:2018
Test procedure .....:	Type test
Non-standard test method .....:	N/A
Test Report Form No.....:	IEC62031F
Test Report Form(s) Originator ....:	Intertek Semko AB
Master TRF.....:	2018-06-14

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Test item description ..... :	lamp for Inflatable model
Trade Mark ..... :	SONPUBO
Manufacturer ..... :	Same as applicant
Model/Type reference ..... :	B2 lamp
Ratings ..... :	DC 12V, 40mA, 0,48W

☒	**Testing Laboratory:**		
Testing location/ address.....:		**Shenzhen LCS Compliance Testing Laboratory Ltd.** 101-201, No.39 Building, Xialang Industrial Zone, Heshuikou Community, Matian Street, Guangming District, Shenzhen, China	
Tested by.....:		Kim Chen (Engineer)	Kim Chen
Check by.....:		Torres He (Director)	
Approved by.....:		Jesse Liu (Manager)	

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

Attachment No. 1: 1 pages of European group differences and national differences according to EN IEC 62031:2020.

Attachment No. 2: 1 pages of report IEC TR 62778.

Attachment No. 3: 3 pages of report IEC/EN 62471.

Attachment No. 4: 3 pages of photo documentation.

Summary of testing:

Tests performed (name of test and test clause): IEC 62031:2018 IEC TR 62778:2014	**Testing location:** Shenzhen Southern LCS Compliance Testing Laboratory Ltd. 101-201, No.39 Building, Xialang Industrial Zone, Heshuikou Community, Matian Street, Guangming District, Shenzhen, China

Summary of compliance with National Differences:

List of countries addressed

EN IEC 62031:2020

EN 62471:2008

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.

lamp for Inflatable model **SONPUBO**
Model: B2 lamp
12V ⎓, 40mA, 0.48W, tc 80ºC

Shenzhen Shangpin Youbo Technology Co., Ltd
102, Building D, Baoying Industrial Zone, Longxi Community, Longgang Street, Longgang District, Shenzhen City, Guangdong Province

Note 1: The height of letters and numerals is 2mm;
Note 2: The height of graphical symbol is 5mm;
Note 3: The others' rating labels are only different from the model name and electrical parameter.

Test item particulars.....:	
Classification of installation and use.....:	Independent, IP20, indoor use only
Supply Connection.....:	Connection leads
.....:	
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 .....:	Mar. 03, 2023
Date (s) of performance of tests.....:	Mar. 03, 2023 to Mar. 18, 2023
General remarks:	
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. **Throughout this report a ☒ comma / ☐ point is used as the decimal separator.** **Clause numbers between brackets refer to clauses in IEC 61347-1**	
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).....:	Same as applicant's name & address.

General product information:

Product: lamp for Inflatable model
Rating: DC12V, 40mA, tc 80°C, independent LED modules, details see below model list.

1. The products under test are independent LED module, suitable for direct mounting on normally flammable surfaces.

Model list:
B2 lamp

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict

4	**GENERAL REQUIREMENTS**		P
4.2	Classification		P
	Built-in module ..... :	Yes ☐ No ☒	—
	Independent module..... :	Yes ☒ No ☐	—
	Integral module ..... :	Yes ☐ No ☒	—
4.6	Independent modules comply with requirements in IEC 60598-1:2014/AMD1:2017		P
4.8	Modules with integrated controlgear providing SELV comply with requirements according to IEC 61347-1:2015/AMD1:2017 clause L.5 to L.11.	(see Annex 1)	N/A

6	**MARKING**		P
6.2	**Contents of marking for built-in and for independent LED modules**		**P**
	a) mark of origin		P
	b) model number, type reference		P
	c1) constant voltage module; rated supply voltage and supply frequency		P
	c2) constant current module; rated supply current and supply frequency		N/A
	d) rated power		P
	e) indication of connections, wiring diagram		N/A
	f) value of t_c and place on the module	80°C	P
	g) *E*thr if required		N/A
	h) symbol for built-in modules		N/A
	i) heat transfer temperature t_d		N/A
	j) power for heat-conduction P_d		N/A
	k) working voltage for insulation		N/A
6.3	**Location of marking for built-in LED modules**		**N/A**
	- marking of a) and b) in 6.2 on the modules		N/A
	- marking of other applicable items in 6.2 on the modules or in data sheet, leaflet or website		N/A
6.4	**Location of marking for independent LED modules**		**P**
	- marking of a), b), c) and f) in 6.2 on the modules		P
	- marking of other applicable items in 6.2 on the modules or in data sheet, leaflet or website		P

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Clause	Requirement + Test	Result - Remark	Verdict
6.5	**Marking of integral LED modules**		**N/A**
	- information in 6.2 a) to g) in data sheet, leaflet or website		N/A
6.6	**Durable and legibility of marking**		**P**
	- marking on the LED module legible after test with water		P
	- marking not on the LED module legible		P
7	**TERMINALS**		**N/A**
7.1	**Integral terminals**		**N/A**
	Screw terminals comply with section 14 of IEC 60598-1	(see Annex 3)	N/A
	Screwless terminals comply with section 15 of IEC 60598-1	(see Annex 4)	N/A
7.2	**Terminals other than integral terminals**		**N/A**
	Separately approved; component list	(see Annex 2)	N/A
	Ratings suit the conditions		N/A
	Satisfy additional relevant requirements of this standard		N/A
8 (9)	**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
	Test according 7.2.3 of IEC 60598-1		N/A
- (9.2)	**Provision for functional earthing**		**N/A**

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Clause	Requirement + Test	Result - Remark	Verdict
	Comply with clause 8 and 9.1		N/A
	Functional earth insulated from live parts by double or reinforced insulation		N/A
- (9.3)	**Lamp controlgear with conductors for protective earthing by tracks on printed circuit 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
	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
9 (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)	N/A
- (A3)	Voltage > 35 V peak or > 60 V d.c. or protective impendance device	(see Annex A)	N/A
- (10.1)	Lacquer or enamel not used for protection or insulation		N/A
	Adequate mechanical strength on parts providing protection		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
- (10.2)	Capacitors > 0,5 μF: voltage after 1 min (V): < 50 V .....:		N/A
- (10.3)	Controlgear providing SELV		N/A
	Accessible conductive parts are insulated from live parts by double or reinforced insulation in SELV controlgear		N/A
	No connection between output circuit and the body or protective earthing circuit		N/A
	No possibility of connection between output circuit and the body or protective earthing circuit through other conductive parts		N/A
	SELV outputs separated from earth by at least basic insulation		N/A
	ELV conductive parts insulated as live parts		N/A
	Tests according Annex L of IEC 61347-1		N/A
- (10.4)	Accessible conductive parts in SELV circuits		P
	Output voltage under load ≤ 25 V r.m.s. or ≤ 60 V d.c.	Max. 12Vdc	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		N/A
	Y1 or Y2 capacitors comply with IEC 60384-14		N/A
	Resistors comply with test (a) in 14.1 of IEC 60065		N/A
10 (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 ..... :	From +/- to enclosure: 100 MΩ	P
	For double or reinforced insulation ≥ 4 MΩ ..... :		N/A
	Between primary and secondary circuits in controlgear providing SELV, values in Annex L in IEC 61347-1		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

11 (12)	**ELECTRIC STRENGTH**		**P**
	Immediately after clause 11 electric strength test for 1 min		P
	Basic insulation for SELV, test voltage 500 V	From +/- to enclosure: 500V	P
	Working voltage ≤ 50 V, test voltage 500 V		N/A
	Working voltage > 50 V ≤ 1000 V, test voltage (V):		N/A
	Basic insulation, 2U + 1000 V		N/A
	Supplementary insulation, 2U + 1000 V		N/A
	Double or reinforced insulation, 4U + 2000 V		N/A
	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		N/A

12 (14)	**FAULT CONDITIONS**		**P**
- (14.1)	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
- (14.2)	Short-circuit of creepage distances and clearances if less than specified in clause 16 in Part 1 (after any reduction in 14.2 - 14.5)	(see appended table)	N/A
- (14.3)	Short-circuit or interruption of semiconductor devices	(see appended table)	P
- (14.4)	Short-circuit across insulation consisting of lacquer, enamel or textile	(see appended table)	N/A
- (14.5)	Short-circuit across electrolytic capacitors	(see appended table)	N/A
	Short-circuit or interruption of SPDs	(see appended table)	N/A
- (14.6)	After the tests has been carried out on three samples:		P
	The insulation resistance ≥ 1 MΩ .....:	> 20 MΩ	P
	No flammable gases		P

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Clause	Requirement + Test	Result - Remark	Verdict
	No accessible parts have become live		N/A
	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		P
- (14.7)	Relevant fault condition tests with high-power a.c. supply and in turn to a d.c. supply		—
12.2	**Overpower condition**		**P**
	Module withstands overpower condition >15 min.		P
	Module with automatic protective device or power limiter, test performed 15 min. at limit.		N/A
	No fire, smoke or flammable gas is produced		P
	Molten material does not ignite tissue paper, spread below the module		P
14 (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**		**N/A**
	Printed circuits used as internal connections complies with clause 14		N/A
15 (16)	**CREEPAGE DISTANCES AND CLEARANCES**		**P**
- (16.1)	**General**		P
	Creepage distances and clearances according to 16.2 and 16.3		P
	Controlgears providing SELV comply with additional requirements in Annex L		N/A
	Insulating lining of metallic enclosures		N/A
	Controlgear protected against pollution comply with Annex P		N/A
- (16.2)	**Creepage distances**		P
- (16.2.2)	Minimum creepage distances for working voltages		P
	Creepage distances according to Table 7	(see appended table)	P
- (16.2.3)	Creepage distances for working voltages with frequencies above 30 kHz		N/A
	Creepage distances according to Table 8	(see appended table)	N/A
- (16.3)	**Clearances**		P

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Clause	Requirement + Test	Result - Remark	Verdict
- (16.3.2)	Clearances for working voltages		P
	Clearances distances according to Table 9	(see appended table)	P
- (16.3.3)	Clearances for ignition voltages and working voltages with higher frequencies		N/A
	Clearances distances for basic or supplementary insulation according to Table 10		N/A
	Clearances distances for reinforced insulation according to Table 11		N/A
16 (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)		—
(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
(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

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Clause	Requirement + Test	Result - Remark	Verdict

17 (18)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		**P**
- (18.1)	Ball-pressure test .....:	See Test Table 17 (18.1)	P
- (18.2)	Test of printed boards .....:	See Test Table 17 (18.2)	P
- (18.3)	Glow-wire test (650°C) .....:	See Test Table 17 (18.3)	P
- (18.4)	Needle-flame test (10 s) .....:	See Test Table 17 (18.4)	P
- (18.5)	Proof tracking test .....:	See Test Table 17 (18.5)	N/A

18	**RESISTANCE TO CORROSION**		**N/A**
	Comply with requirements according 4.18 of IEC 60598-1		N/A

20	**HEAT MANAGEMENT**		**P**
20.1	**General**		**P**
	Fulfil clause 20 if replaceable LED module and when heat conducting thermal interface is needed.		P
20.2	**Thermal interface material**		**N/A**
	Thermal interface material delivered with the module if necessary		N/A
20.3	**Heat protection**		**N/A**
	Not impair safety when operated under poor heat-conduction conditions according Annex D		N/A

22	**PHOTOBIOLOGICAL SAFETY**		**P**
22.1	**UV radiation**		**N/A**
	Luminous radiation not exceed 2mW/klm		N/A
22.2	**Blue light hazard**		**P**
	Assessed according to IEC TR 62778	RG0	P
22.3	**Infrared radiation**		**N/A**
	Requirements for infrared radiation when required		N/A

A	**ANNEX A - TESTS**		**P**
	All tests performed in accordance with the advice given in Annex H of IEC 61347-1, if applicable		P

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Clause	Requirement + Test	Result - Remark	Verdict

12 (14)	TABLE: tests of fault conditions	P
Part	**Simulated fault**	**Hazard**
Model: B2 lamp		
LED	Short circuited, shut down	No
LED	Open circuited, shut down	No
Resistance	Short circuited, shut down	No

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict

15 (16)	TABLE: clearance and creepage distance measurements (mm)							P
Applicable part of IEC 61347-1 Table 7 – 11*								
Distances	**Insulation type ****	**Measured clearance**	**Required**		**Measured creepage**	**Required**		
			clearance	***Table**		**creepage**	***Table**	
Distance 1:	B	--	--	--	--	--	--	
Working voltage (V) ..... :					DC 12V (SELV)			—
Frequency if applicable (kHz) ..... :					--			—
PTI..... :					< 600 ☒ ≥ 600 ☐			—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... :					--			—
Pulse voltage if applicable (kV) ..... :					--			—
Supplementary information: Max. input 24Vdc								

** Insulation type: B – Basic; S – Supplementary; R – Reinforced

17 (18.1)	TABLE: Ball Pressure Test of Thermoplastics			P
Allowed impression diameter (mm) ..... :		2		—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)	
PCB	--	125	1,0	
Enclosure	--	125	0,8	
LED cover	--	125	0,8	
Supplementary information:				

17 (18.2)	TABLE: Test of printed boards				P
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (s)	Ignition of specified layer Yes/No	Duration of burning (s)	Verdict
PCB	--	10	No	0	P
Supplementary information:					

17 (18.3)	TABLE: Glow-wire test	P

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Clause	Requirement + Test	Result - Remark	Verdict

Glow wire temperature ..... :	650°C				—
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
Enclosure	--	30	No	0	P
LED cover	--	30	No	0	P
Any flame or glowing of the sample extinguished within 30 s of withdrawing the glow-wire, and any burning or molten drop did not ignite the underlying parts (Yes/No) ..... :					No
Supplementary information:					

17 (18.4)	**TABLE: Needle-flame test**				**P**
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
PCB	--	10	No	0	P
Supplementary information:					

17 (18.5)	**TABLE: Proof tracking test**				**N/A**
Test voltage PTI ..... :		175 V			—
Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens			Verdict
--	--	--	--	--	--
Supplementary information:					

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Clause	Requirement + Test	Result - Remark	Verdict

(A)	**ANNEX A - TEST TO ESTABLISH WHETHER A CONDUCTIVE PART IS A LIVE PART WHICH MAY CAUSE AN ELECTRIC SHOCK**		**N/A**
(A.1)	Comply with A.2 or A.3		N/A

ANNEX 1	**LED MODULES WITH INTEGRAL CONTROLGEAR PROVIDING SELV**		**N/A**
(L.5)	**Protection against electric shock**		N/A
	Comply with 9.2 of IEC 61558-1		N/A
(L.6)	**Heating**		N/A
	No excessive temperatures in normal use		N/A
	Value if capacitor tc marked .....:		—
	Winding insulation classified as Class .....:		—
	Comply with tests of clause 14 of IEC 61558-1 with adjustments		N/A
(L.7)	**Short-circuit and overload protection**		N/A
	Comply with tests of clause 15 of IEC 61558-1 with adjustments		N/A
(L.8)	**Insulation resistance and electric strength**		N/A
(L.8.1)	Conditioned 48 h between 91 % and 95 %		N/A
(L.8.2)	Insulation resistance		N/A
	Between input- and output circuits not less than 5 MΩ .....:		N/A
	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 .....:		N/A
(L.8.3)	Electric strength		N/A
	1) Between live parts of input circuits and live parts of output circuits .....:		N/A
	2) Over basic or supplementary insulation between:		N/A
	a) live parts having different polarity .....:		N/A
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	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 .....:		N/A
(L.9)	**Construction**		N/A
(L.9.1)	Transformer comply with 19.12 of IEC 61558-1 and 19 of IEC 61558-2-6		N/A
	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, clearances and distances through insulation**		N/A
	Creepage distances and clearances not less than in Clause 16		N/A
	Distance through insulation according Table L.5 in IEC 61347-1		N/A
	1) Basic distance through insulation		N/A
	Required distance (mm) .....:		—
	Measured (mm) .....:		N/A
	Supplementary information		—
	2) Supplementary distance through insulation		N/A
	Required distance (mm) .....:		—
	Measured (mm) .....:		N/A
	Supplementary information		—
	3) Reinforced distance through insulation		N/A
	Required distance (mm) .....:		—
	Measured (mm) .....:		N/A
	Supplementary information		—

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Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 2	TABLE: Critical components information					
Object / part No.	**Code**	**Manufacturer/ trademark**	**Type / model**	**Technical data**	**Standard**	**Mark(s) of conformity[1)]**
DC lead wire	B	Zhongshan Yucheng Lighting Accessories Factory	H05V-K	300V, 1x 0,75 mm^2	EN 50525-2-31:2011	VDE 40044036
LED	C	GUANGDONG ANKLIGHT OPTP TECHNOLOGY CO.,LTD	WP-A2835XXXX-R8	Vf: 3,0VDC; If: 60mA CCT: 2800-7200K	IEC TR 62778:2014	Tested with appliance
LED PCB	C	ZHANGZHOU DAZHENG ELECTRONIC TECHNOLOGY CO LTD	CZ-1004	V-0, T80ºC	IEC 62031:2018	UL E323040 Tested with appliance
Enclosure	C	COVESTRO DEUTSCHLAND AG [PC RESINS]	6555 + (z)(f1)	PC; V-2	--	UL E41613
LED cover	C	TEIJIN POLYCARBONATE CHINA LTD	LN-2250Z(p2)(f1), LN-2250U(#)(f1), LN-2250V(#)(f1)	PC	--	UL E245526

Supplementary information:

[1)] Provided evidence ensures the agreed level of compliance. See OD-CB2039.

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 62031			
Clause	Requirement + Test	Result - Remark	Verdict
ANNEX 3	**Screw terminals (part of the luminaire)**		N/A
(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).....:		—
(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 62031			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 4	**Screwless terminals (part of the luminaire)**		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
(15.5.1)	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
(15.5.1.2)	Permanent connections: pull-off test (20 N)		N/A
(15.5.2)	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
(15.6)	Terminals and connections for external wiring		N/A
(15.6.1)	Conductors		N/A

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict
	Terminal size and rating		N/A
(15.6.2)	Mechanical tests		N/A
(15.6.2.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N) .....:		N/A
(15.6.2.2)	Pull test pin or tab terminals (4 samples); pull (N) .....:		N/A
(15.6.3)	Electrical tests		N/A
	Tests according 15.6.3.1 + 15.6.3.2 in IEC 60598-1		N/A

(15.6.3.1) (15.6.3.2)	**TABLE: Contact resistance test / Heating tests**									N/A
	Voltage drop (mV) after 1 h									—
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)										
Supplementary information:										

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 5	TABLE: Thermal tests of Section 12		P
	Type reference ..... :	B2 lamp	—
	Lamp used..... :	LED module	—
	Lamp control gear used..... :	--	—
	Mounting position of luminaire ..... :	As normal use	—
	Supply wattage (W) ..... :		—
	Supply current (A) ..... :		—
	Temperatures in test 1 - 4 below are corrected for ta (°C) ..... :		—
	- abnormal operating mode ..... :	--	—
1.12 (12.4)	- test 1: rated voltage ..... :	--	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current ..... :	1,1x12V	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage ..... :	--	—
	Through wiring or looping-in wiring loaded by a current of A during the test ..... :	--	—
1.12 (12.5)	- test 4: 1,1 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current ..... :	--	—

Temperature measurements (°C)

Part	Ambient	Cl. 12.4 – normal				Cl. 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
DC wire	45	--	57,5	--	85	--	--
LED PCB (tc)	45	--	78,4	--	80	--	--
Enclosure	45	--	65,4	--	Ref.	--	--
LED cover	45	--	58,4	--	Ref.	--	--
Mounting surface	45	--	62,1	--	90	--	--
Supplementary information:--							

Attachment No.1

ATTACHMENT TO TEST REPORT IEC 62031

EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES

LED modules for general lighting – Safety specifications

Differences according to.....: EN IEC 62031 :2020

	CENELEC COMMON MODIFICATIONS (EN)	P
	No Common modifications	P

Attachment No.2

IEC TR 62778 Photobiological safety of lamps and lamp systems			
Clause	Requirement + Test	Result - Remark	Verdict

Table 22	**Spectroradiometric measurement (IEC TR 62778:2014)**		--
	Measurement performed on:	**Luminaire**	--
	Model number	B2 lamp	--
	Test voltage (V)	24	--
	Test current (mA)	--	--
	Test frequency (Hz)	50	--
	Ambient, t (°C)	25.0	--
	Measurement distance	☒ 20 cm ☐ ... cm	--
	Source size	☒ Non-small ☐ Small : .... mm	--
	Field of view	☐ 100 mrad ☒ 11 mrad ☐ 1,7 mrad (for small sources)	--

Item	Symbol	Units	Result	Risk Group
Correlated colour temperature	CCT	K	--	--
x/y colour coordinates	--	--	--	--
Blue light hazard radiance	L_B	W/(m²•sr¹)	1683	☐ RG0: <100 ☒ RG1: <10000 ☐ RG2: <4000000
Blue light hazard irradiance	E_B	W/m²	--	--
Luminance	L	cd/m²	--	--
Illuminance	E	lx	--	--
Supplementary information:				

Attachment No.3

IEC/EN 62471 Photobiological safety of lamps and lamp systems			
Clause	Requirement + Test	Result - Remark	Verdict
4	**EXPOSURE LIMITS (EL'S)**		**---**
4.2	Specific factors involved in the determination and application of retinal exposure limits		P
4.2.1	Pupil diameter		P
4.2.2	Angular subtense of source and measurement field-of-view		P
4.3	Hazard exposure limits		P
4.3.1	Actinic UV hazard exposure limit for the skin and eye		N/A
4.3.2	Near-UV hazard exposure limit for the eye		N/A
4.3.3	Retinal blue light hazard exposure limit		P
4.3.4	Retinal blue light hazard exposure limit - small source		P
4.3.5	Retinal thermal hazard exposure limit		N/A
4.3.6	Retinal thermal hazard exposure limit – weak visual stimulus		P
4.3.7	Infrared radiation hazard exposure limits for the eye		N/A
4.3.8	Thermal hazard exposure limit for the skin		P
5	**MEASUREMENT OF LAMPS AND LAMP SYSTEMS**		**P**
5.1	Measurement conditions		P
5.1.1	Lamp ageing (seasoning)		P
5.1.2	Test environment		P
5.1.3	Extraneous radiation		P
5.1.4	Lamp operation		P
5.1.5	Lamp system operation		P
5.2	Measurement procedure		P
5.2.1	Irradiance measurements		P
5.2.2	Radiance measurements		P
5.2.3	Measurement of source size		P
5.2.4	Pulse width measurement for pulsed sources		N/A
5.3	Analysis methods		P
5.3.1	Weighting curve interpolations		P
5.3.2	Calculations		P
5.3.3	Measurement uncertainty		P
6	**LAMP CLASSIFICATION**		**N/A**
6.1	Continuous wave lamps		N/A
6.1.1	Exempt group		N/A
6.1.2	Risk Group 1 (Low-Risk)		N/A
6.1.3	Risk Group 2 (Moderate-Risk)		N/A

Attachment No.3

IEC/EN 62471 Photobiological safety of lamps and lamp systems			
Clause	Requirement + Test	Result - Remark	Verdict
6.1.4	Risk Group 3 (High-Risk)		N/A
6.2	Pulsed lamps		N/A
Annex A	**SUMMARY OF BIOLOGICAL EFFECTS**		**--**
Annex B	**MEASUREMENT METHOD**		**--**
Annex C	**UNCERTAINTY ANALYSIS**		**--**
Annex D	**GENERAL REFERENCES**		**--**

Table 6.1	**Emission limits for risk groups of continuous wave lamps**									**N/A**
Risk	**Action spectrum**	**Symbol**	**Units**	**Emission Measurement**						
				Exempt		**Low risk**		**Mod risk**		
				Limit	**Result**	**Limit**	**Result**	**Limit**	**Result**
Actinic UV	SUV(λ)	Es	$W•m^{-2}$	0,001	3,1e-06	-	-	-	-
Near UV		E_{UVA}	$W•m^{-2}$	0,33	2,9e-05	-	-	-	-
Blue light	B(λ)	L_B	$W•m^{-2}•sr^{-1}$	100	1,66e+03	10000	-	4000000	-
Blue light, small source	B(λ)	E_B	$W•m^{-2}$	0,01*	3,72e-01	1,0	-	400	-
Retinal thermal	R(λ)	L_R	$W•m^{-2}•sr^{-1}$	28000/α	1,9e+04	28000/α	-	71000/α	-
Retinal thermal, weak visual stimulus**	R(λ)	L_{IR}	$W•m^{-2}•sr^{-1}$	545000 0,0017 ≦α≦ 0,011	--				
				6000/α 0,011≦ α≦0.1	--				
IR radiation, eye		E_{IR}	$W•m^{-2}$	100	4,8e-02	570	-	3200	-

Attachment No.3

IEC/EN 62471 Photobiological safety of lamps and lamp systems			
Clause	Requirement + Test	Result - Remark	Verdict

Table 6.1	Emission limits for risk groups of continuous wave lamps	N/A

* Small source defined as one with α < 0,011 radian. Averaging field of view at 10000 s is 0,1 radian.
** Involves evaluation of non-GLS source

Note: The action functions: see Table 4.1 and Table 4.2
The applicable aperture diameters: see 4.2.1
The limitations for the angular subtenses: see 4.2.2
The related measurement condition 5.2.3 and the range of acceptance angles: see Table 5.5

Attachment No.4

Photo Documentation

View:
Model:
B2 lamp

[X]General
[ ]Front
[ ]Rear
[ ]Internal
[ ]Top
[ ]Bottom
[ ]PWB

Figure 1

View:

[ ]General
[ ]Front
[X]Rear
[ ]Internal
[ ]Top
[ ]Bottom
[ ]PWB

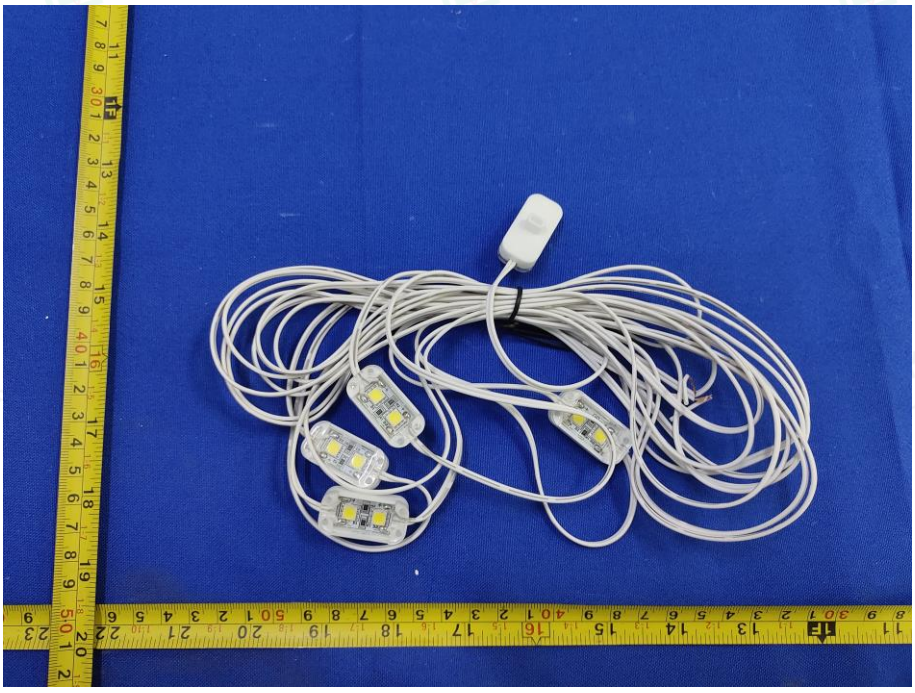

Figure 2

Attachment No.4

Photo Documentation

View:

[ ]General
[ ]Front
[ ]Rear
[X]Internal
[ ]Top
[ ]Bottom
[ ]PWB

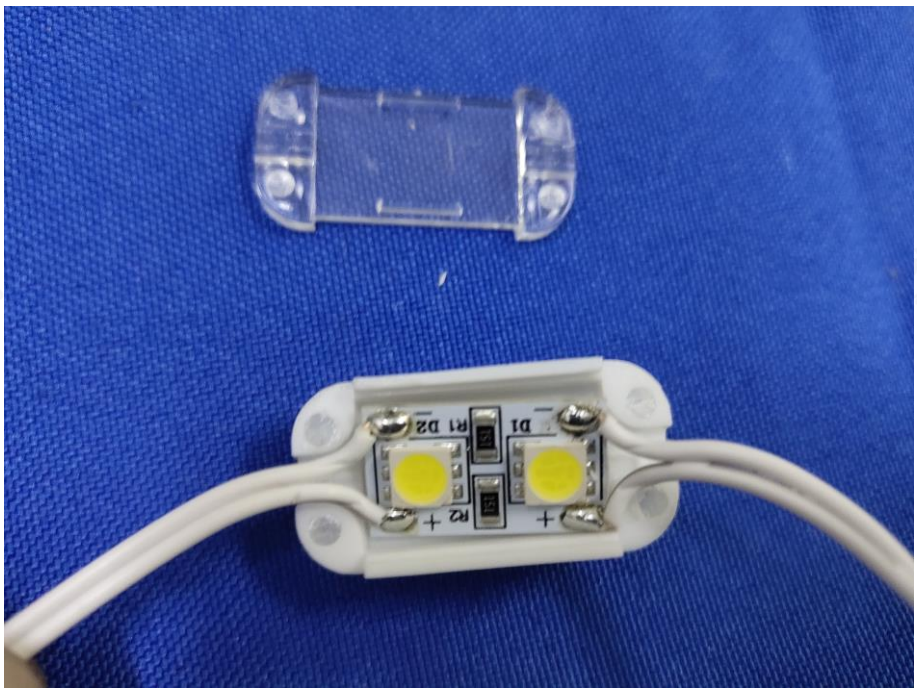

Figure 3

View:

[ ]General
[ ]Front
[ ]Rear
[X]Internal
[ ]Top
[ ]Bottom
[ ]PWB

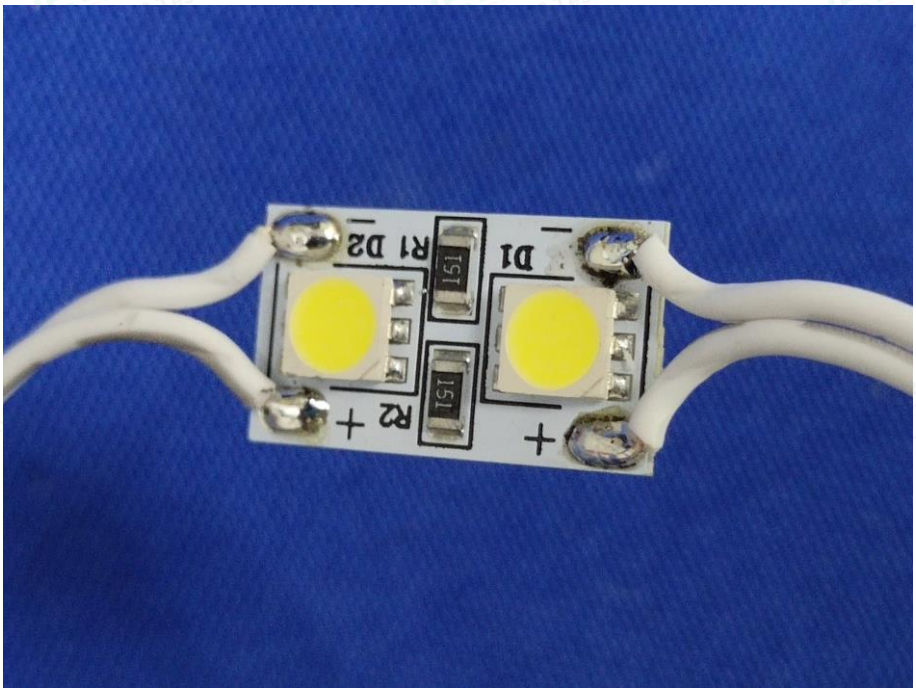

Figure 4

Attachment No.4

Photo Documentation

View:

[ ]General
[ ]Front
[ ]Rear
[X]Internal
[ ]Top
[ ]Bottom
[ ]PWB

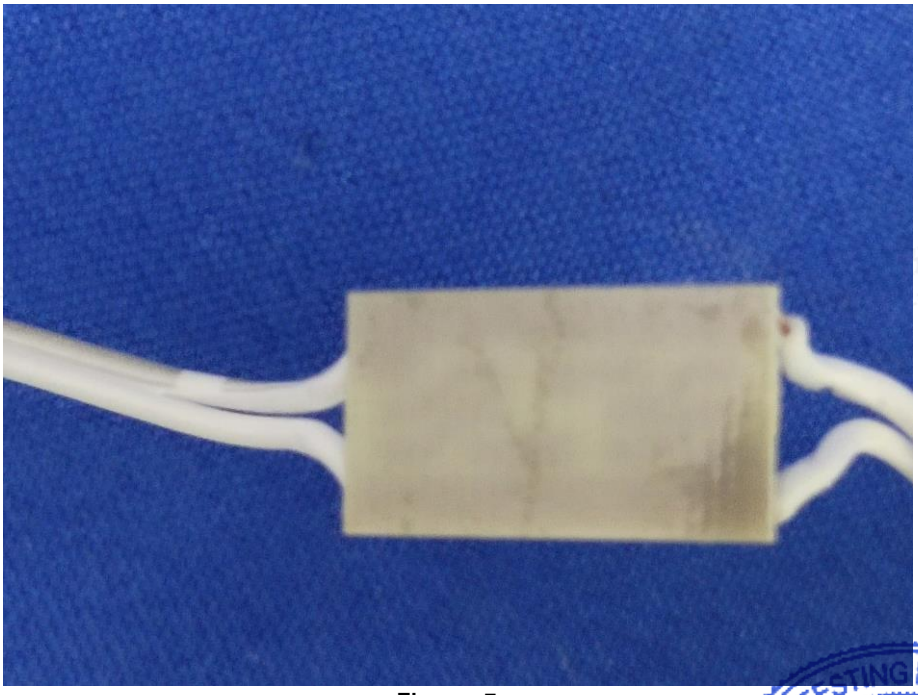

Figure 5

----------End of Test Report----------