

TEST REPORT IEC 61347-2-13 Part 2: Particular requirements Section Thirteen – d.c. or a.c. supplied electronic controlgear for LED modules	
Report Reference No.....	STR15058005S
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Address	1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road, Bao'an District, Shenzhen, P.R.C (518101)
Testing location / address	As above
Applicant's name.....	Zhong Shan Berdis Lighting Co., LTD
Address	5F, No.10-12, South 2 nd Lane, Huasheng East Road, Caosan Industrial Park, Guzhen Town, Zhongshan City, Guangdong Province, P.R. China
Test specification:	
Standard	IEC 61347-2-13: 2006 used in conjunction with IEC 61347-1 (Second Edition) : 2007+A1:2010
Test procedure	CB Scheme
Non-standard test method.....	N/A
Test Report Form No.....	IEC61347_2_13B
Test Report Form(s) Originator	Intertek Semko AB
Master TRF.....	Dated 2007-11
Test item description	LED Dimmable Driver
Trade Mark	
Manufacturer	Zhong Shan Berdis Lighting Co., LTD
Address	5F, No.10-12, South 2 nd Lane, Huasheng East Road, Caosan Industrial Park, Guzhen Town, Zhongshan City, Guangdong Province, P.R. China
Model/Type reference	Details refer to the page 2 and 3 model list
Ratings	Details refer to the page 2 and 3 model list
Note	N/A



Test item particulars:

Type of controlgear.....: Independent
 Supply Connection.....: Screw terminal block
 Operating condition.....: Continuous
 Class of equipment: Class II
 Mass of equipment (g).....: 0.085kg
 Pollution degree: ☒ PD 2 ☐ PD 3
 IP protection class: IPX0

Possible test case verdicts:

- test case does not apply to the test object: N (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.....: May 5, 2015
 Date(s) of performance of tests.....: May 5, 2015 to May 15, 2015

General remarks:

The test results presented in this report relate only to the object tested.
 This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
 "(see Enclosure #)" refers to additional information appended to the report.
 "(see appended table)" refers to a table appended to the report.
 Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

General product information:

Independent controlgear, non-inherently short circuit proof, constant current output, Class II, IP20, ta=45°C, tc=75°C (at the bottom of enclosure above transformer) .
 All models are same circuit construction, except for model names, transformer, the secondary components and secondary ratings, see below model list and different for detail.

Model List and different						
No.	Mode No.	Input Voltage(V)	input current (A)	Output voltage(V)	output current (mA)	Transformer No.
1	EC013-0350-A01	AC 220-240V, 50/60Hz	0.1	27-42	350	K.C.AA-057501
2	EC013-0320-A01			27-42	320	K.C.AA-057501
3	EC013-0280-A01			27-42	280	K.C.AA-057501
4	EC013-0260-A01			27-42	260	K.C.AA-057501
5	EC012-0350-A01			27-42	350	K.C.AA-057501

6	EC012-0320-A01	AC 220-240V, 50/60Hz	0.1	27-42	320	K.C.AA-057501
7	EC012-0300-A01			27-42	300	K.C.AA-057501
8	EC012-0280-A01			27-42	280	K.C.AA-057501
9	EC012-0260-A01			27-42	260	K.C.AA-057501
10	EC012-0240-A01			27-42	240	K.C.AA-057501
11	EC010-0350-A01			22-34	350	K.C.AA-057502
12	EC010-0320-A01			22-34	320	K.C.AA-057502
13	EC010-0280-A01			27-42	280	K.C.AA-057501
14	EC010-0260-A01			27-42	260	K.C.AA-057501
15	EC010-0240-A01			27-42	240	K.C.AA-057501
16	EC010-0220-A01			27-42	220	K.C.AA-057501
17	EC008-0350-A01			22-34	350	K.C.AA-057502
18	EC008-0320-A01			22-34	320	K.C.AA-057502
19	EC008-0260-A01			27-42	260	K.C.AA-057501
20	EC008-0220-A01			27-42	220	K.C.AA-057501

Copy of the marking plate:

BERDIS LIGHTING

LED Dimmable Driver
Constant Current

Model: EC013-0350-A01
Input: 220-240V~ 50/60Hz 0.1A
Output: 350mA, 27- 42VDC
Max. output voltage: 54VDC
ta=45°C, tc=75°C

0.75~2.5□

220~240V~ac

0.75~2.5□

SEC

• tc

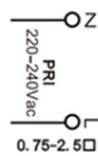
CE

RoHS

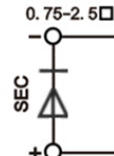
SAA APPROVALS



LED Dimmable Driver Constant Current



Model: EC010-0350-A01
Input: 220-240V~ 50/60Hz 0.1A
Output: 350mA, 22-34VDC
Max. output voltage: 39VDC
 $t_a=45^{\circ}\text{C}$, $t_c=75^{\circ}\text{C}$ •tc



IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
4 (4)	GENERAL REQUIREMENTS		P
	Compliance of independent controlgear enclosure with EN 60598-1		P
	Independent SELV controlgear comply with Annex I		P
	– Where the controlgear has accessible outputs, the controlgear shall be SELV output and comply with Annex I. (AS/NZS 61347.2.13:2013)		P
	– SELV equivalent is not permitted where controlgear has accessible outputs or is classified as independent SELV. (AS/NZS 61347.2.13:2013)		P
6 (6)	CLASSIFICATION		P
	Independent controlgear	Yes ☒ No ☐	—
	Built-in controlgear	Yes ☐ No ☒	—
	Integral controlgear	Yes ☐ No ☒	—
	SELV-equivalent or isolating controlgear.....	Yes ☐ No ☒	—
	Auto-wound controlgear.....	Yes ☐ No ☒	—
	Independent SELV controlgear.....	Yes ☒ No ☐	—
7	MARKING		P
7.1 (7.1)	Mandatory markings:		P
	- mark of origin		P
	- model number, type reference	See rating label	P
	- symbol for independent controlgear, if applicable		P
	- correlation between interchangeable parts and controlgear marked		N
	- rated supply voltage (V)	220-240V	P
	- earthing symbol		N
	- wiring diagram		P
	- value of t_c	75°C	P
	- symbol for declared temperature		N
	Constant voltage type:	Yes ☐ No ☒	—
	- rated supply voltage (V)		N
	Constant current type:	Yes ☒ No ☐	—
	- rated output current (A)	Max. 350mA	P
	- rated maximum output voltage (V)	Max. 54Vdc	P
	- indication if for LED modules only	Indicated in instruction manual and label	P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
7.2 (7.1)	- information to be provided, if applicable		P
	- declaration on protection against accidental contact	IP20	P
	- cross-section of conductors (mm ²) :	0.75-2.5mm ²	P
	- number, type and wattage of lamp(s)		P
	- directly mains-connected windings		N
	SELV-equivalent controlgear		N
- (7.2)	Marking durable and legible		P
	Rubbing 15 s water, 15 s petroleum; marking legible	After the test there was no damage to the label. The marking did not fade. There was no curling nor lifting of on the edge	P

8 (10)	PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS		P
- (10.1)	Controlgear protected against accidental contact with live parts		P
- (A2)	The current flowing between the part concerned and earth is measured and does not exceed 0,7 mA (peak) or 2 mA d.c.:	Measured current : 0.160mA Limit:0.7mA	P
- (A2)	For frequencies above 1 kHz, the current does not exceed 0,7 mA (peak) multiplied by the value of the frequency in kilohertz or 70 mA (peak):	Measured current : 0.160mA Limit:0.7mA	P
- (A3)	The voltage between the part concerned and any accessible part is measured and does not exceed 34 V (peak).....:	32.8V	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:	X-cap. (CX1)=0.068uF	N
8.1 (-)	SELV-equivalent controlgear accessible parts are insulated from live parts by double or reinforced insulation according 8.6 and 13.1 in IEC 60065		N
8.2 (-) (AS/NZS 61347.2.13 :2013)	Output circuits of SELV controlgear with accessible outputs shall not exceed 25 V r.m.s.	DC output	N
	or 60 V d.c. ripple-free d.c. under load except as indicated below.	Not exceed 60 V d.c. ripple-free d.c. under load	P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	If the voltage exceeds 25 V r.m.s. or 60 V ripple-free d.c., the output shall comply with the following:		N
	a) the touch current shall not exceed: – for a.c.: 0,7 mA (peak); – for d.c.: 2,0 mA;		N
	b) the no-load output shall not exceed $33\sqrt{2}$ V peak or 60 V ripplefree d.c.		N
	For controlgears with more than one supply voltage, the requirements are applicable for each of the rated supply voltages.		N
	Insulated terminals		N
	Accessible conductive parts separated by double or reinforced insulation, that may be one capacitor Y1 or two capacitors Y2 of the same values used in series between SELV or SELV-equivalent output and primary circuits	Approved CY1 Capacitor used	P
	- Capacitor complying with IEC 60384-14	Approved CY1 Capacitor used	P
	- Other components bridging the separating transformer complying with IEC 60065, clause 14		N
9 (8)	TERMINALS		P
	Screw terminals: compliance with Section 14 of IEC 60598-1	See the Appendix 4 Screw terminals	P
	Screwless terminals: compliance with Section 15 of IEC 60598-1		N
9.1	Plug-in controlgear with pins for direct insertion into a socket-outlet shall comply with Appendix J of AS/NZS 3112:2011.	No plug-in	N
10 (9)	PROVISION FOR EARTHING		N
	External metal parts connected to the earthterminal:	Class II appliance	N
	- compliance with 7.2.1 in IEC 60598-1		N
	Test with a current of 10 A between earthing terminal and each of the accessible metal parts; measured resistance (Ω): $< 0,5 \Omega$		N
	Protective earth, symbol		N
	Terminal complying with clause 8 in Part 1		N
	Locked against loosening and not possible to loosen by hand		N
	Not possible to loosen clamping means unintentionally on screwless terminals		N

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Earthing via means of fixing		N
	Earthing terminal only used for the earthing of the control gear		N
	All parts of material minimizing the danger of electrolytic corrosion		N
	Made of brass or equivalent material		N
	Contact surface bare metal		N
	Conductors by tracks on printed circuit boards:		N
	- a.c. current of 25 A for 1 min between earthing terminal and accessible metal parts		N
	- compliance with clause 7.2.1 in IEC 60598-1		N
11 (11)	MOISTURE RESISTANCE AND INSULATION		P
	After storage 48h at 91-95% relative humidity and 20-30 °C measuring of insulation resistance with d.c. 500V (MΩ):		P
	≥ 2MΩ for basic insulation	Between different polarity of L, N: >100 MΩ	P
	≥ 4MΩ for double or reinforced insulation.....	Between live parts and output terminal: >100MΩ, between live parts and plastic enclosure with foil: >100 MΩ	P
11 (-)	Adequate insulation between input and output terminals not bounded together in SELV-equivalent controlgear		N
12 (12)	ELECTRIC STRENGTH		P
	Immediately after clause 11 electric strength test for 1 min		P
	Working voltage ≤ 42 V, test voltage 500 V		N
	Working voltage > 42 V ≤ 1000 V, test voltage (V):		P
	Basic insulation, 2U + 1000 V	1480V	P
	Supplementary insulation, 2U + 1750 V	2230V	P
	Double or reinforced insulation, 4U + 2750 V	See annex I	P
	No flashover or breakdown		P
	Windings in separating transformers in SELV-equivalent control gear according to 14.3.2 of EN 60065		N
13 (13)	THERMAL ENDURANCE FOR WINDINGS (Not applicable)		—
14 (14)	FAULT CONDITIONS		P
	When operated under fault conditions the controlgear:		P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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
	Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected	(see appended table)	P
- (14.1)	Short-circuit of creepage distances and clearances if less than specified in clause 16 in Part 1 (except between live parts and accessible metal parts)	(see appended table)	P
	Distances on printed boards provided with coating according to IEC 60664-3		N
- (14.2)	Short-circuit or interruption of semiconductor devices	(see appended table14)	P
- (14.3)	Short-circuit across insulation consisting of lacquer, enamel or textile		N
- (14.4)	Short-circuit across electrolytic capacitors	(see appended table)	P
- (14.5)	After the tests the insulation resistance with d.c. 500 V (MΩ) are $\geq 1 \text{ M}\Omega$	Between live parts and output terminals: $>100 \text{ M}\Omega$ Between live parts and plastic enclosure with foil : $>100 \text{ M}\Omega$	P
	After the tests the accessible parts has not become live		P
	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		P
	Temperature declared thermally protected controlgear fulfil the requirements in Annex C		N

15	TRANSFORMER HEATING		P
	Windings of separating transformer in a SELV-equivalent controlgear fulfil the requirements according to 7.1 and 11.2 of IEC 60065	(See appended table 15)	P
15.1	Temperatures do not exceed the changed values of the values in column 2 of Table 3 of IEC 60065, in respect to relevant ambient temperature at t_c , under normal operation	(See appended table 15)	P
15.2	Temperatures do not exceed the changed values of the values in column 3 of Table 3 of IEC 60065, in respect to relevant ambient temperature at t_c , under abnormal conditions of Cl. 16 and fault conditions of Cl. 14		P
	Ambient temperature at t_c	45.6°C	P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
16	ABNORMAL CONDITIONS		P
	Safety not impaired when the controlgear is operated at any voltage between 90% and 110% of rated voltage		P
16.1	Control gear which are of the constant voltage output type:		—
	a) No LED module inserted		N
	b) Double LED modules or equivalent load connected to the output terminals		N
	c) Output terminal short-circuited (20 cm and 200 cm or declared length)		N
	During and at the end of the tests no defect impairing safety, nor any smoke or flammable gases produced		N
16.2	Control gear which are of the constant current output type:		—
	a) No LED module connected		P
	b) Double the LED modules or equivalent load connected in series to the output terminals		P
	c) Output terminal short-circuited (20 cm and 200 cm or declared length)		P
	Maximum output voltage not exceeded		P
	During and at the end of the tests no defect impairing safety, nor any smoke or flammable gases produced		P
	d) For controlgear with SELV output, the LED modules, or equivalent load for which the controlgear is designed, shall continue to be connected in series incrementally to the output terminals until the controlgear ceases to operate or the output voltage is stabilized. (AS/NZS 61347.2.13:2013)	The output shutdown	P
	During the tests specified under d), the maximum voltage measured on the output terminals shall not exceed the SELV limits of Clause 8. (AS/NZS 61347.2.13:2013)	The output shutdown	P
17 (15)	CONSTRUCTION		P
- (15.1)	Wood, cotton, silk, paper and similar fibrous material not used as insulation		P
- (15.2)	Printed boards used as internal connections complies with clause 14 of IEC 61347-1		P
	Socket-outlet in the output circuit does not accept plugs complying with IEC 60083 and IEC 60906		N

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Not possible to engage plugs accepted by socket-outlet in the output circuit with socket-outlets complying with IEC 60083 and IEC 60906		N
18 (16)	CREEPAGE DISTANCES AND CLEARANCES		P
	Creepage distances and clearances according to Table 3 and 4, as appropriate	(see appended table)	P
	Printed boards see clause 14 of IEC 61347-1		P
	Insulating lining of metallic enclosures		N
19 (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
	- self-tapping screws		N
	- thread-cutting screws		N
	- at least two self-tapping screws		N
(4.11.3)	Screw locking:		N
	- spring washer		N
	- rivets		N
(4.11.4)	Material of current-carrying parts		N
(4.11.5)	No contact to wood		N
(4.12)	Mechanical connections and glands		N
(4.12.1)	Mechanical stress	No used screw fixed	N
	Screws not made of soft metal		N
	Screws of insulating material		N
	Torque test: part; torque (Nm)		N
	Torque test: part; torque (Nm)		N
	Torque test: part; torque (Nm)		N
(4.12.2)	Screw diameter < 3 mm screwed into metal		N
(4.12.3)	Void		—
(4.12.4)	Locked connections		N
(4.12.5)	Screwed glands: force (N)		N
20 (18)	RESISTANCE TO HEAT, FIRE AND TRACKING		P
20 (18.1)	Parts of insulating material retaining live parts in position, ball-pressure test:		P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	- part; test temperature (°C).....:	Plastic enclosure:125°C, Ø0.8mm	P
	- part; test temperature (°C).....:	Transformer bobbin:125°C Ø0.8 mm	P
	- part; test temperature (°C).....:	Output terminal: 125°C, 0.8mm	P
20 (18.2)	Printed boards in accordance with IEC 60249-1, 4.3	UL approved PCB used Min. V-0 used	P
20 (18.3)	External parts of insulating material preventing electric shock glow-wire test 650 °C	Plastic Enclosure Output terminal	P
20 (18.4)	Parts of insulating material retaining live parts in position, needle-flame test 10 s:		P
	- flame extinguished within 30 s	Bobbin of transformer Output terminal	P
	- no flaming drops igniting tissue paper		P
20 (18.5)	Tracking test		N

21 (19)	RESISTANCE TO CORROSION		N
	Rust protection:		N
	- test according 4.18.1 of IEC 60598-1		N
	- adequate varnish on the outer surface		N

- (20)	NO-LOAD OUTPUT VOLTAGE		P
	No load output voltage not differ more than 10 % from rated voltage		P

14	Table of fault conditions					P
part	0.9xUn	1.1xUn	Short-circuited	Dis-connected		hazard
BR1	0.9x220 =198V	1.1x240 =264V	X	--	Fuse open, BR1 damaged, no hazard.	No
Q1 pin 1-3	0.9x220 =198V	1.1x240 =264V	X	--	Unit shutdown immediately, can't recoverable, no hazard.	No
Q1 pin 1-2	0.9x220 =198V	1.1x240 =264V	X	--	Fuse open, Q1 damaged, no hazard.	No
Q1 pin 2-3	0.9x220 =198V	1.1x240 =264V	X	--	Fuse open, Q1 damaged, no hazard.	No
U1 Pin 2-3	0.9x220 =198V	1.1x240 =264V	X	--	Fuse open, U1 damaged, no hazard.	No
T1 pin 5-6	0.9x220 =198V	1.1x240 =264V	X	--	Unit shutdown immediately and recoverable, no damage	No
C6	0.9x220 =198V	1.1x240 =264V	X	--	Unit shutdown immediately and recoverable, no damage	No

IEC 61347-2-13						
Clause	Requirement + Test				Result - Remark	Verdict
14	Table of fault conditions					P
part	0.9xUn	1.1xUn	Short-circuited	Dis-connected		hazard
D1	0.9x220 =198V	1.1x240 =264V	X	--	Unit shutdown immediately and recoverable, no damage	No
Output	0.9x220 =198V	1.1x240 =264V	X	--	Unit shutdown immediately and recoverable, no damage	No

18 (16)	TABLE: creepage distances and clearances						P
	Minimum distances for a.c. (50-60 Hz) sinusoidal voltages						
RMS working voltage (V) not exceeding	50	150	250	500	750	1000	
1 minimum distances between live parts of different polarity. Specify the value measured.	—	—	<u>7.9</u>	—	—	—	
2 minimum distances between live parts and accessible parts which are permanently fixed to the ballast, including screws or devices for fixing covers or fixing the ballast to its support. Specify the value measured.	—	—	<u>7.5</u>	—	—	—	
- required creepage distances (mm), insulation PTI ≥ 600	0,6	1,4	1.7	3	4	5,5	
- required creepage distances (mm), insulation PTI < 600	1,2	1,6	<u>2.5</u>	5	8	10	
- required clearances (mm)	0,2	1,4	1.7	3	4	5,5	
3 minimum distances between live parts and a flat supporting surface or a loose metal cover, if any, if the construction does not ensure that the values under 2 above are maintained under the most unfavourable circumstances	—	—	—	—	—	—	
- required clearances (mm)	2	3,2	<u>3.6</u>	4,8	6	8	
	Minimum distances for non-sinusoidal pulse voltages						
rated pulse voltage (peak kV)	2,0	2,5	3,0	4,0	5,0	6,0	8,0
required minimum distances, clearances (mm)	1,0	1,5	2	3	4	5,5	8
Specify the value measured	—	—	—	—	—	—	—
rated pulse voltage (peak kV)	10	12	15	20	25	30	40
required minimum distances, clearances (mm)	11	14	18	25	33	40	60
Specify the value measured	—	—	—	—	—	—	—
rated pulse voltage (peak kV)	50	60	80	100	-	-	-
required minimum distances, clearances (mm)	75	90	130	170	-	-	-



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IEC 61347-2-13							
Clause	Requirement + Test			Result - Remark			Verdict
Specify the value measured	—	—	—	—	—	—	—

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
A	ANNEX A (NORMATIVE), TEST TO ESTABLISH WHETHER A CONDUCTIVE PART IS A LIVE PART WHICH MAY CAUSE AN ELECTRIC SHOCK		P
A.2	See clause 8 A.2 in this Test Report		P
A.3	See clause 8 A.3 in this Test Report		P
C	ANNEX C – PARTICULAR REQUIREMENTS FOR ELECTRONIC LAMP CONTROLGEAR WITH MEANS OF PROTECTION AGAINST OVERHEATING		N
C3	GENERAL REQUIREMENTS		N
C3.1	Thermal protection means integral with the controlgear, protected against mechanical damage		N
	Renewable only by means of a tool		N
	If function depending on polarity, for cord-connected equipment protection means in both leads		N
	Thermal links comply with IEC 60691		N
	Electrical controls comply with IEC 60730-2-3		N
C3.2	No risk of fire by breaking (clause C7)		N
C5	CLASSIFICATION		N
	a) automatic resetting type		—
	b) manual resetting type		—
	c) non-renewable, non-resetting type		—
	d) renewable, non-resetting type		—
	e) other type of thermal protection; description		N
C6	MARKING		N
C6.1	Symbol for temperature declared thermally protected ballasts		N
C6.2	Declaration of the type of protection provided		N
C7	LIMITATION OF HEATING		N
C7.1	Preselection test		N
	Test sample placed for at least 12 h in an oven having temperature ($t_c - 5$) K		N
	No operation of the protection device		N
C7.2	Functioning of protection means		N
	Normal operation of the sample in a test enclosure according to Annex D at an ambient temperature such that ($t_c + 0; -5$) °C is obtained		N

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	No operation of the protection device		N
	Introducing of the most onerous test condition determined during test of clause 14		N
	Output of windings connected to the mains supply short-circuited, and other part of the controlgear operated under normal conditions		N
	Increasing of the current through the windings continuously until operation of the protection means		N
	Continuous measuring of the highest surface temperature		N
	Controlgear according to C5 a) or C5 e) operated until stable conditions are achieved		N
	Automatic-resetting thermal protectors working 3 times		N
	Controlgear according to C5b) working 6 times		N
	Controlgear according to C5 c) and C5) d) working once		N
	Highest temperature does not exceed the marked value		N
	Any overshoot of 10% over the marked value within 15 min		N
D	ANNEX D – REQUIREMENTS FOR CARRY OUT THE HEATING TESTS OF THERMALLY PROTECTED LAMP CONTROLGEAR		N
	Tests in C7 performed in accordance with Annex D, if applicable		N
E	ANNEX E – USE OF CONSTANT S OTHER THAN 4500 IN t_w TESTS		N
E1	Constant S claimed		N
	Claimed test method		N
E2	Procedure A		N
	Adequate data provided by the manufacturer		N
	The inverse of the slope is greater than or equal to the claimed value of S		N
	Compliance with the failure criteria for procedure B		N
E3	Procedure B		N
	Claimed value of T_1		N
	Claimed value of T_2		N
	Endurance test carried out at:		N
	T_1 (7 samples)		N
	T_2 (7 samples)		N

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Duration of test calculated from equation (2)		N
	T ₁		N
	T ₂		N
	During the test: - No open circuit - No breakdown insulation		N
	The claimed constant S is deemed to be verified		N
F	ANNEX F - DRAUGHT-PROOF ENCLOSURE		P
	Draught-proof enclosure in accordance with the description		P
	Dimensions of the enclosure		P
	Other design; description		N
H	ANNEX H - TESTS		P
	All tests performed in accordance with the advise given in Annex H, if applicable		P
I	ANNEX I - PARTICULAR ADDITIONAL REQUIREMENTS FOR INDEPENDENT SELV D.C. OR A.C. SUPPLIED ELECTRONIC CONTROLGEAR FOR LED MODULES		P
I.3	Classification		—
I.3.1	Class I	Yes ☐ No ☒	—
	Class II	Yes ☒ No ☐	—
I.3.2	a) non-inherently short circuit proof controlgear	Yes ☒ No ☐	—
	b) non-inherently open circuit proof controlgear	Yes ☐ No ☒	—
	c) inherently short circuit proof controlgear	Yes ☐ No ☒	—
	d) inherently open circuit proof controlgear	Yes ☐ No ☒	—
	e) fail safe controlgear	Yes ☐ No ☒	—
	f) non-short-circuit proof controlgear	Yes ☐ No ☒	—
	g) non-open-circuit proof controlgear	Yes ☐ No ☒	—
I.4	Marking		P
	Adequate symbols are used		P
I.5	Protection against electric shock		P
I.5.1	No connection between output winding and body		P
	No connection between output winding and protective earthing circuit		N
I.5.2	Input and output circuits electrically separated		P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	from each other		
I.5.2.1	Insulation between input and output winding of the HF-transformer consists of double or reinforced insulation	Secondary winding with triple insulated wire	P
	Class II: insulation between input/output and body consists of double or reinforced insulation		P
	Class I: insulation between input and body consists of basic and between output and body supplementary insulation	Class II appliance	N
I.5.2.2	Insulation between input and output winding via the core consists of double or reinforced insulation		P
	Insulation between cord and windings of the HF-transformer consists of basic insulation		N
I.5.2.3	Serrated tape, additional layer		N
I.5.2.4	Class I controlgear for fixed connection provided with basic insulation plus protective screening comply with the following conditions:	Class II appliance	N
	a) Insulation between the input winding and the protective screen complies with the requirements for basic insulation		N
	b) Insulation between the protective screen and the output winding complies with the requirements for basic insulation		N
	c) Metal screen consists of a metal foil or of a wire wound screen		N
	d) Metal screen so arranged that both edges cannot simultaneously touch a magnetic core		N
	e) Metal screen and its lead-out wire have a cross-section sufficient to ensure that an overload device will open the circuit before the screen is destroyed		N
	f) Lead-out wire sufficiently fixed to the metal screen		N
I.5.2.5	Last turn of each winding of the transformer retained by positive means		P
	Impregnated winding		N
	Winding held together by means of insulating material		P
I.5.3	Components bridging between input and output circuit	Bridge capacitor(CY1)	P
I.5.3.1	Used capacitors and resistors comply with 8.2	VDE approval	P
I.5.3.2	Used opto-couplers		N
I.6	Heating		—

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
I.6.1	No excessive temperatures in normal use	(See the table 15)	P
	Used material classified as Class _____		—
	Stated value of t_a _____		—
I.6.2	Upri: 1.06 time supply rated voltage		—
	Determined temperature rises in windings: - Primary: _____ K - Limit max: _____ K - Secondary: _____ K - Limit max: _____ K	(See the table 15)	P
	After the test:		P
	- no connections have worked loose		P
	- no reduction of creepage distances and clearances		P
	- no flow of sealing compound		N
	- no operation of protecting devices		N
	- electric strength test between input and output windings		P
I.6.3	Cycling test (10 cycles):		N
I.6.3.1	- heat run at _____ K		N
I.6.3.2	- moisture treatment 48 h		N
I.6.3.3	- vibration test 1 h; 1,5 g		N
I.6.3.4	After the tests:		N
	- insulation resistance		N
	- dielectric strength test at 35 % of specified value; test voltage _____ V		N
	- Current or the ohmic component does not deviates by more than 30 %		N
I.7	Short-circuit and overload protection		P
I.7.1	Upri: 1.06 times rated voltage or 0.94 and 1.06 times rated supply voltage - used voltage _____ V	1,06 x 240 V = 254.4 V	P
I.7.2 I.7.3 I.7.4	Determined temperature rise in windings and on other parts:		P
	- test according to Clause <u>I.7.2</u>	1.7.3	P
	- Primary winding _____ K	63.9K for model: EC010-0350-A01; 58.2K for model: EC013-0350-A01	P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	- Limit max _____ K	150K	P
	- Secondary winding _____ K	Same as primary winding	P
	- Limit max _____ K	Same as primary winding	P
	- External enclosure _____ K	30.3K for model: EC010-0350-A01; 28.0K for model: EC013-0350-A01	P
	- Limit max 80 K		P
	- Rubber insulation of wiring _____ K		N
	- Limit max 60 K		N
	- PVC insulation of wiring _____ K		N
	- Limit max 60 K		N
	- Supports _____ K		N
	- Limit max 80 K		N
I.7.5	Fail-safe convertors		N
I.7.5.1	- Upri: 1.06 times rated supply voltage V		—
	- Isec: 1.5 times rated output current A		—
	- time until steady-state conditions t1 (h)		—
	- time until failure t2 (h): $\leq t1$; ≤ 5 h.....		N
I.7.5.2	During the test:		N
	- no flames, molten material, etc.		N
	- temperature rise of enclosure ≤ 150 K		N
	- temperature rise of plywood support ≤ 100 K		N
	After the test:		N
	- electric strength (test voltage; 35 % of specified value); no flashover or breakdown for primary-to-secondary and for primary-to-body		N
	- live parts not accessible by test finger through holes of enclosure		N
I.8	Insulation resistance and electric strength		P
I.8.1	Conditioned 48 h between 91 % and 95 %	25.0°C, 93%	P
I.8.2	Adequate insulation (500 V d.c. for 1 min) between:		P
	Live parts and the body -for basic insulation not less than 2 M Ω		N
	Live parts and the body -for reinforced insulation not less than 4 M Ω	Between different polarity of L, N: >100M Ω	P
	Input and output circuits not less than 5 M Ω	Between input circuit and plastic enclosure with	P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
		foil : >100 MΩ; Between input circuit and output circuit: >100 MΩ	
	Metal parts of class II controlgear which are separated from live parts by basic insulation only and the body not less than 5 MΩ		N
	Metal foil in contact with the inner and outer surfaces of enclosures of insulating material not less than 2 MΩ		N
I.8.3	Electric strength test:		P
	1) Between live parts of input circuits and live parts of output circuits	Between input circuit and output circuit: 3750V	P
	2) Over basic or supplementary insulation between:		P
	a) live parts which are or may become of different polarity	1875V	P
	b) live parts and body if intended to be connected to protective earth		N
	c) accessible metal parts and a metal rod of the same diameter as the flexible cable or cord		N
	d) live parts and an intermediate metal part		N
	e) intermediate metal parts and the body		N
	3) Over reinforced insulation between the body and live parts	Between live parts and plastic enclosure with foil: 3750 V	P
	No flashover or breakdown occurred		P
I.9	Construction		P
I.9.1	Comply with all requirements		P
I.9.2	The distance between input and output terminals shall not be less than 25 mm	>25mm	P
I.10	Components		P
I.10.1	Socket-outlets in the output circuit does not accept plugs complying with IEC 60083 and IEC 60906-1		N
I.10.2	Self-resetting protective devices shall not be used unless it is certain that there will be no hazards		P
	Compliance is checked by connecting the controlgear for 48 h at 1.06 times the rated voltage with the output short-circuited		N
I.11	Creepage distances and clearances		P
	1. Insulation between input and output circuits:		P
	a) measured values > specified values (mm)	Primary and secondary of Y-C (CY1) : measured CI&Cr 6.8mm, required: CI&Cr 6.0 mm;	P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
		Transformer primary pin and sec. winding: measured Cl. & Cr.: >10.0 mm, required Cl. & Cr.: 6.0 mm	
	b) measured values $\geq$ specified values (mm)		N
	c) measured values $\geq$ specified values (mm)	two layers insulation tape used	P
	2. Insulation between adjacent input circuits: measured values $\geq$ specified values (mm)		N
	2. Insulation between adjacent output circuits: measured values $\geq$ specified values (mm)		N
	3. Insulation between terminals for external connection:		N
	a) measured values $\geq$ specified values (mm)		N
	b) measured values $\geq$ specified values (mm)		N
	c) measured values $\geq$ specified values (mm)		N
	4. Basic or supplementary insulation:		P
	a) measured values $\geq$ specified values (mm)	Different polarity of fusing F1: measured Cl. & Cr.: 3.1mm, Required Cl. & Cr.: 3.0 mm; L to N: measured Cl. & Cr.: 7.9mm, Required Cl. & Cr.: 3.0 mm	P
	b) measured values $\geq$ specified values (mm)		N
	c) measured values $\geq$ specified values (mm)		N
	5. Reinforced insulation: measured values $\geq$ specified values (mm)	Live parts to plastic enclosure, measured Cl. & Cr.: 7.5mm, required Cl. & Cr.: 6.0mm	P
	6.Distance through insulation:		P
	a) measured values > specified values (mm)		N
	b) measured values > specified values (mm)		N
	c) measured values > specified values (mm)		N
	d) measured values > specified values (mm)	Enclosure thickness: 1.0mm Required: 0.8mm	P

15	TABLE: Annex I.6.2 Heating test, thermocouples			P
	Model No.:	EC010-0350-A01		—
	Test voltage (V):	See below for detail		—
	Wattage(W) / current(A)	--		—
	Ambient (°C) :	45.0		—
Thermocouple locations		dT (K)		Max. dT (K)
		198V	254.4V	
X-cap. (CX1) body		19.5	22.7	100-45=55
L2 winding		20.4	23.2	130-45=85
L2 core		19.8	22.5	130-45=85
L1 body		20.8	22.6	130-45=85
L3 body		24.6	29.0	130-45=85
Varistor (VR1)		28.3	34.2	85-45=40
PCB under BR1		30.6	35.1	130-45=85
PCB under Q1		51.2	60.2	130-45=85
PCB near U1		47.8	55.9	130-45=85
PCB near D3		64.6	72.4	130-45=85
Electronic Capacitor (C4)		41.9	48.5	105-45=60
Winding of Transformer(T1)		56.3	62.0	110-45=65
Core of Transformer (T1)		47.4	52.7	110-45=65
Bridge capacitor (CY1)		28.9	34.8	125-45=80
Electronic Capacitor (C6)		37.1	41.7	105-45=60
PCB near D1		48.6	52.6	130-45=85
Output terminal		36.9	42.3	110-45=65
Plastic Enclosure inside bottom near T1		33.8	38.4	--
Plastic Enclosure outside bottom near T1		24.7	29.0	75-45=30
Plastic Enclosure inside top near T1		25.5	29.6	--
Plastic Enclosure outside top near T1		19.0	20.4	75-45=30

15	TABLE: Annex I.6.2 Heating test, thermocouples			P
	Model No.:	EC013-0350-A01		—
	Test voltage (V):	See below for detail		—
	Wattage(W) / current(A)	--		—
	Ambient (°C) :	45.0		—
Thermocouple locations		dT (K)		Max. dT (K)
		198V	254.4V	



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X-cap. (CX1) body	21.5	23.4	100-45=55
L2 winding	22.7	23.8	130-45=85
L2 core	22.0	21.6	130-45=85
L1 body	22.8	24.4	130-45=85
L3 body	27.2	30.7	130-45=85
Varistor (VR1)	26.8	31.5	85-45=40
PCB under BR1	21.9	22.8	130-45=85
PCB under Q1	38.3	44.2	130-45=85
PCB near U1	37.3	42.6	130-45=85
PCB near D3	64.7	71.6	130-45=85
Electronic Capacitor (C4)	35.8	40.6	105-45=60
Winding of Transformer(T1)	47.6	50.8	110-45=65
Core of Transformer (T1)	44.4	47.8	110-45=65
Bridge capacitor (CY1)	27.4	32.2	125-45=80
Electronic Capacitor (C6)	31.1	35.1	105-45=60
PCB near D1	48.7	51.9	130-45=85
Output terminal	30.9	34.5	110-45=65
Plastic Enclosure inside bottom near T1	26.2	29.7	--
Plastic Enclosure outside bottom near T1	21.4	24.8	75-45=30
Plastic Enclosure inside top near T1	27.6	30.9	--
Plastic Enclosure outside top near T1	20.4	23.8	75-45=30



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IEC 60598-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.2.10	Cord anchorage:		P
	- covering protected from abrasion		P
	- clear how to be effective		P
	- no mechanical or thermal stress		P
	- no tying of cables into knots etc.		P
	- insulating material or lining		P
5.2.10.1	Cord anchorage for type X attachment:		N
	a) at least one part fixed		N
	b) types of cable		N
	c) no damaging of the cable		N
	d) whole cable can be mounted		N
	e) no touching of clamping screws		N
	f) metal screw not directly on cable		N
	g) replacement without special tool		N
	Glands not used as anchorage		N
	Labyrinth type anchorages		N
5.2.10.2	Adequate cord anchorage for type Y and type Z attachment		P
5.2.10.3	Tests:		P
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N):	Cord 2.5mm ² : 80N, 0.35Nm Cord 0.75mm ² : 60N, 0.25Nm	P
	- torque test: torque (Nm).....:		P
	- displacement ≤ 2 mm	0.7mm, 0.7mm	P
	- no movement of conductors		P
	- no damage of cable or cord		P

Appendix 1:	Additional test according to AS/NZS 61347.1		
	NATIONAL DEVIATIONS (AS/NZS)		
5	GENERAL NOTES ON TESTS		
	The rated supply voltage is 230 V/400 V +10%, - 6% and for testing according to this Standard, the rated test voltage shall be 240 V/415 V		P
8	TERMINALS, CABLES AND CORDS		
	Screw terminals: compliance with Section 14 of AS/NZS 60598.1		P
	Screwless terminals: compliance with Section 15 of AS/NZS 60598.1		N
	Cables and cords: compliance with the relevant requirements of Section 5 of AS/NZS 60598.1		N
9	PROVISION FOR EARTHING		
9.1	External metal parts connected to the earth terminal:		N
	- compliance with 7.2.3 in AS/NZS 60598.1		N
18	RESISTANCE TO HEAT, FIRE AND TRACKING		
18.2.1	Parts of insulating material retaining current-carrying parts in position, glow-wire test 750 °C	transformer bobbin	P
18.2.2	Parts of insulating material which do not retain live parts in position, glow-wire test 650 °C	Plastic Enclosure, output terminal	P
18.2.3	During the application of the glow-wire tests of subclauses 18.2.1 and 18.2.2, the height and duration of the flames are measured	Transformer bobbin: No flame	P

Appendix 2:

ATTACHMENT TO TEST REPORT IEC 61347-2-13 EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES Part 2-13: Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules Differences according to : IEC 61347-2-13: 2006 used in conjunction with IEC 61347-1:2007							
(16)	Creepage distances and clearances						P
	Minimum distances for a.c. (50-60 Hz) sinusoidal voltages						
RMS working voltage (V) not exceeding		50	150	250	500	750	1000
1 minimum distances between live parts of different polarity. Specify the value measured.		—	—	7.9	—	—	—

2 minimum distances between live parts and accessible parts which are permanently fixed to the ballast, including screws or devices for fixing covers or fixing the ballast to its support. Specify the value measured.	—	—	<u>7.5</u>	—	—	—
- minimum distances for ballasts declared protected against accidental contact between live parts and the outer accessible surface of insulating parts	—	—	—	—	—	—
- required creepage distances (mm), insulation basic PTI ≥ 600	0,6	0.8	1.7	3	4	5,5
- required creepage distances (mm), insulation basic PTI < 600	1,2	1,6	<u>2.5</u>	5	8	10
- required creepage distances (mm), insulation Supplementary PTI ≥ 600	—	0.8	—	3	4	5,5
- required creepage distances (mm), insulation Supplementary PTI < 600	—	1.6	<u>2.5</u>	5	8	10
-required creepage distances (mm), Reinforced insulation	—	3.2	6.0 Limit 5.0	6	8	11
1 minimum distances between live parts of different polarity. Specify the value measured.	—	—	<u>7.9</u>	—	—	—
2 minimum distances between live parts and accessible parts which are permanently fixed to the ballast, including screws or devices for fixing covers or fixing the ballast to its support. Specify the value measured.	—	—	<u>7.5</u>	—	—	—
- minimum distances for ballasts declared protected against accidental contact between live parts and the outer accessible surface of insulating parts	—	—	—	—	—	—
- required clearance distances (mm), Basic insulation	0.2	0.8	1.7	3	4	5.5
- required clearance distances (mm), supplementary insulation		0.8	1.7	3	4	5.5
- required clearance distances (mm), reinforced insulation		1.6	6.0 Limit 3.0	6	8	11
Supplementary information: $V_{rms}=250$						

Appendix 3 Component list					P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity
Plastic Enclosure	LOTTE CHEMICAL CORPORATION	PC-1100(+)	V-2, 125°C, PC	UL94, UL746C	UL E85371
Input metal terminal(L, N)	Dongguan Changhe Electronics Co., Ltd.	K06	6*7*7.3mm	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested in the equipment
Fuse (F1)	Conquer Electronics Co., Ltd.	MST	T1AL, 250V	EN 60127-1, EN 60127-3	VDE 40017118
Alt.	Dongguan Hongda Electronic Technology Co., Ltd.	2009	T1AL, 250V	EN 60127-1, EN 60127-3	VDE 40028260
Line choke (L1)	Huizhou City St.Lotus Electronic Technology Co., Ltd	K.C.AC-011003	6T, 10X7.5	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested in the equipment
Line choke (L3)	FOSHAN KEYI POWER ELECTRONICS CO.,LTD	K.C.AB-033402	L=2.85-3.15MH $\Phi 8 \times 10 \quad \Phi = 0.15$	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested in the equipment
Line choke (L2)	FOSHAN KEYI POWER ELECTRONICS CO., LTD	K.C.AC-005101	L $\geq$ 20MH EE10	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested in the equipment
X-capacitor (CX1)	Tenta Electric Industrial Co. Ltd.	MEX	AC 275V, 0.068 μ F, 40/100/21	IEC 60384-14 2ed UL 60384-14	VDE 119119 UL E222911
Alt.	Shantou Xinyin Electronics Technology Co. Ltd.	MPX	AC 275V, 0.068 μ F, 40/110/56	IEC 60384-14 2ed UL 60384-14	VDE 40040448 UL E470852
Varistor (VR1)	Cerglass MFG Inc	10D561K	420V, 85°C	IEC 61051-1 IEC 61051-2 IEC 61051-2-2	VDE 40028836
Bridge Diode (BR1)	Various	Various	1000V, 1A	--	--
MOSFET (Q1)	Various	Various	4A, 650V	--	--
Transformer (T1)	FOSHAN KEYI POWER ELECTRONICS CO., LTD	K.C.AA-057501	Class B, 130°C	IEC/EN 61347-1 IEC/EN 61347-2-13	Test in appliance

object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity
Alt.	FOSHAN KEYI POWER ELECTRONICS CO., LTD	K.C.AA-057502	Class B, 130°C	IEC/EN 61347-1 IEC/EN 61347-2-13	Test in appliance
--Bobbin of transformer (T1)	CHANG CHUN PLASTICS CO LTD	T375J	Phenolic, 150°C, V-0	UL94	UL E59481
--Primary winding of transformer (T1)	XINGNING JINYAN ELECTRICAL CO LTD	QA-X/130	130°C	UL1446	UL E238500
--Triple insulation wire of transformer (T1)	FURUKAWA ELECTRIC CO LTD	TEX-E	130°C	IEC 60950-1	VDE 006735 UL E206440
--Insulation tape of transformer (T1)	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD	CT-280B	130°C	UL510	UL E165111
--Tubing of transformer (T1)	CHANGYUAN ELECTRONICS GROUP CO LTD	CB-TT-S	200°C, 600V	UL224	UL E180908
--Varnish	HONGDATONG INDUSTRY (DONGGUAN) CO LTD CHINA	WE-386	155°C	ANSI/UL 1446	UL E238459
Bridge -Capacitor (CY1) (Y1 type)	JYH HSU (JEC) ELECTRONICS LTD	JD	400V, 4700pF, 125°C	IEC 60384-14 2ed. UL 60384-14	VDE 40038642 UL E356696
Alt.	Dongguan Easy-gather Electronic Co., Ltd.	DCF	400V, 4700pF, 125°C	IEC 60384-14 2ed. UL 60384-14	VDE 40022942 UL E252221
PCB	GOLDENMAX INTERNATIONAL TECHNOLOGY LTD	GDM-R1, ILM-R1	130°C, V-0	UL94, UL796	UL E224772
Output terminal	Heavy Power Co., Ltd.	PA001	250V, 17.5A, T110	EN 60998-1 EN 60998-2-1	VDE 40019265
Alt.	Putian Hanjiang Fucon Electronics Co., Ltd.	CM 200 - 5.0	250V ,10A ,T120	EN 60998-1 EN 60998-2-1	VDE 40022547
Alt.	Dongguan Changhe Electronics Co., Ltd.	CA350-00-500	250V, 16A, T110	EN 60998-1 EN 60998-2-1	VDE 40021481
Mylar sheet	LOTTE CHEMICAL CORPORATION	PC-1100(+)	V-2, 125°C, PC	UL94, UL746C	UL E85371

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

* Component has been certified by UL according to UL standards. Compliance with the requirements of the product standard(s) (see page one of this test report) has been checked.

Appendix 4	Screw terminals (part of the luminaire)	P
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(14)	SCREW TERMINALS		P
(14.2)	Type of terminal.....	Pillar terminals	—
	Rated current (A).....	< 10A	—
(14.3.2.1)	One or more conductors	One conductor	P
(14.3.2.2)	Special preparation		N
(14.3.2.3)	Terminal size	1	P
	Cross-sectional area (mm ²)	0.75-2.5mm ²	P
(14.3.3)	Conductor space (mm).....	1.7mm	P
(14.4)	Mechanical tests		P
(14.4.1)	Minimum distance	4.4mm	P
(14.4.2)	Cannot slip out		P
(14.4.3)	Special preparation		N
(14.4.4)	Nominal diameter of thread (metric ISO thread)	M	P
	External wiring		P
	No soft metal		P
(14.4.5)	Corrosion		P
(14.4.6)	Nominal diameter of thread (mm)	<4.7mm	P
	Torque (Nm)	0.8Nm	P
(14.4.7)	Between metal surfaces		N
	Lug terminal		N
	Mantle terminal		N
	Pull test; pull (N)		N
(14.4.8)	Without undue damage		P



Appendix 5	Installation manual
Installation Instruction Please read the instruction carefully prior to use the product and keep it properly for future reference. Company: Zhong Shan Berdis Lighting Co., LTD Address: 5F, No.10-12, South 2nd Lane, Huasheng East Road, Caosan Industrial Park, Guzhen Town, Zhongshan City, Guangdong Province, P.R. China Model: EC013-0350-A01, EC013-0320-A01, EC013-0280-A01, EC013-0260-A01, EC012-0350-A01, EC012-0320-A01, EC012-0300-A01, EC012-0280-A01, EC012-0260-A01, EC012-0240-A01, EC010-0350-A01, EC010-0320-A01, EC010-0280-A01, EC010-0260-A01, EC010-0240-A01, EC010-0220-A01, EC008-0350-A01, EC008-0320-A01, EC008-0260-A01, EC008-0220-A01 Technical information: Rating: Independent controlgear, non-inherently short circuit proof, constant current output, Class II, IP20, ta=45°C, tc=75°C (at the bottom of enclosure above transformer). Safety Tips: 1. Please keep this equipment away from humidity; 2. The equipment relies upon the enclosure for protection against electric shock; 3. for safety reason, the equipment should only be opened by qualified technician; 4. If one of the following situations occurred, get the equipment checked by a qualified technician; - a- Liquid has penetrated into the equipment; - b- The equipment has been exposed to moisture; - c- The equipment does not work well or you can not get it work according to the user manual; - d- The equipment has dropped and damaged; - e- If the equipment has obvious sign of breakage. 5. The power supply shall be installed according to the specification by a qualified electrician, the current of each load and total output power of all loads shall not be over the specified as label value; 6. The product only can connected to LED modules; 7. Between the primary terminal and the secondary terminal satisfy reinforced insulation.	

Appendix 6 Photos

Model: EC010-0350-A01

Photo 1



Photo 2

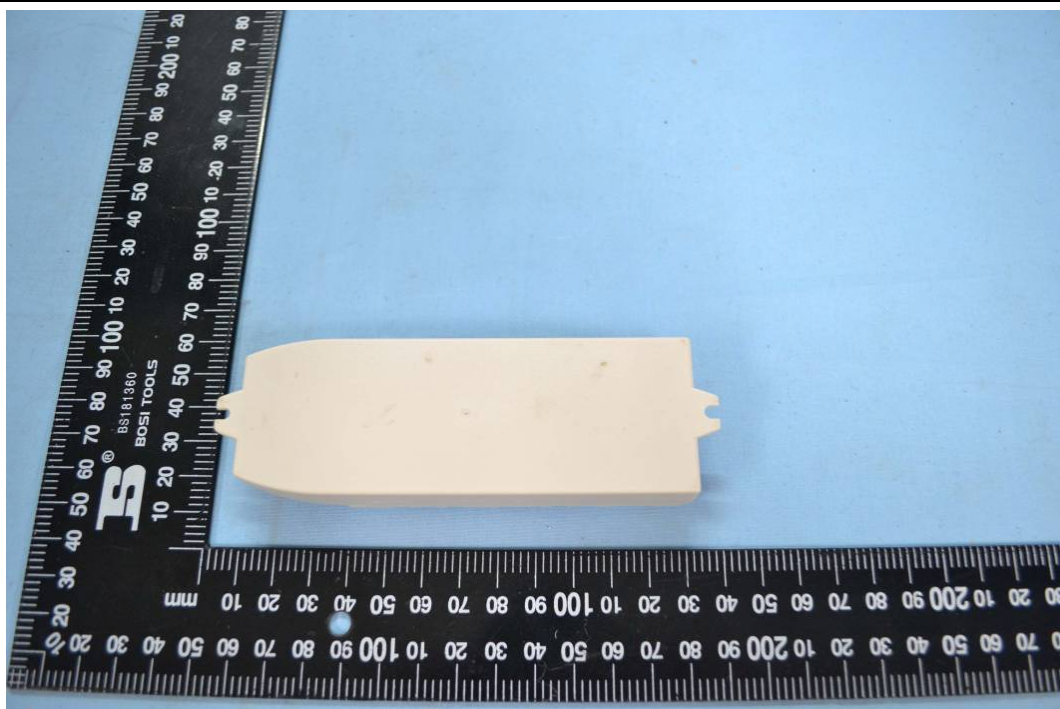


Photo 3

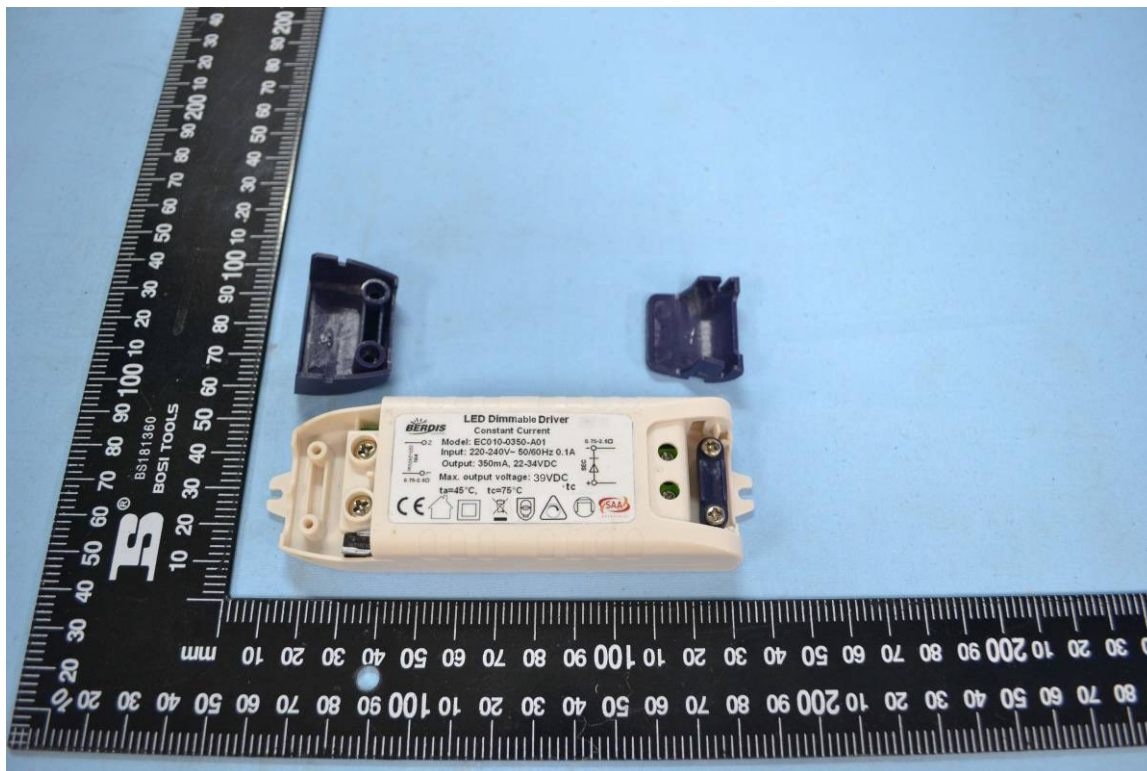


Photo 4

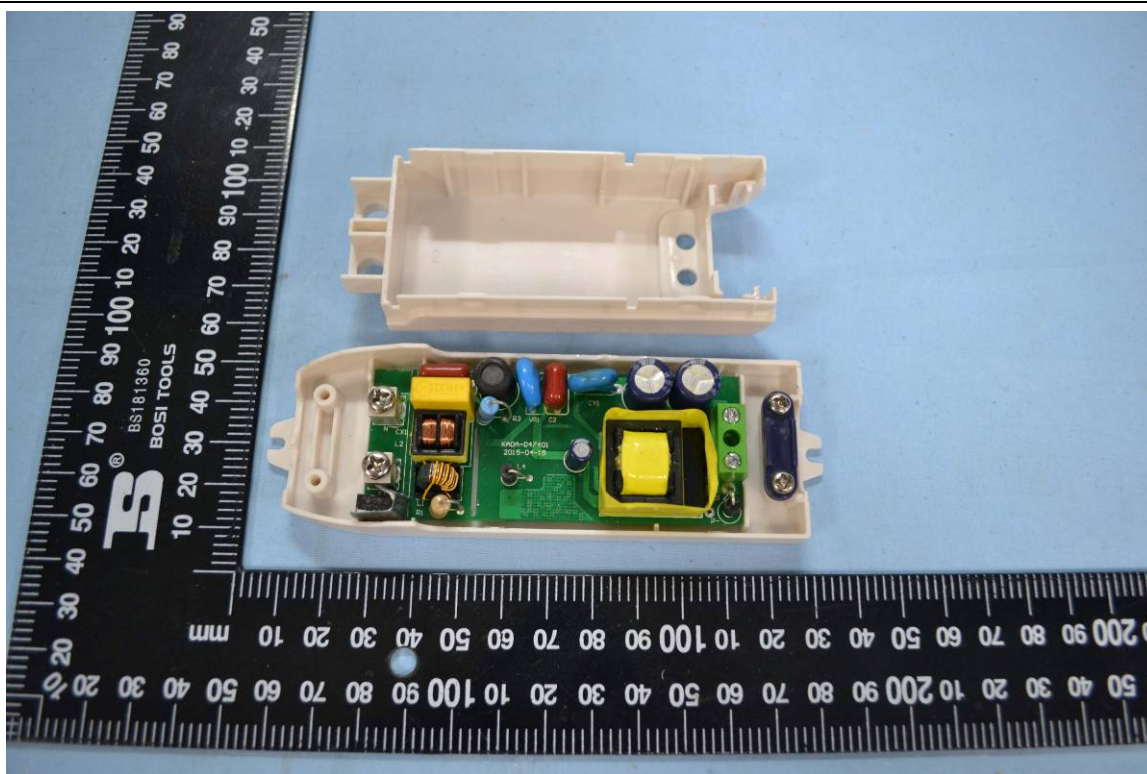


Photo 5

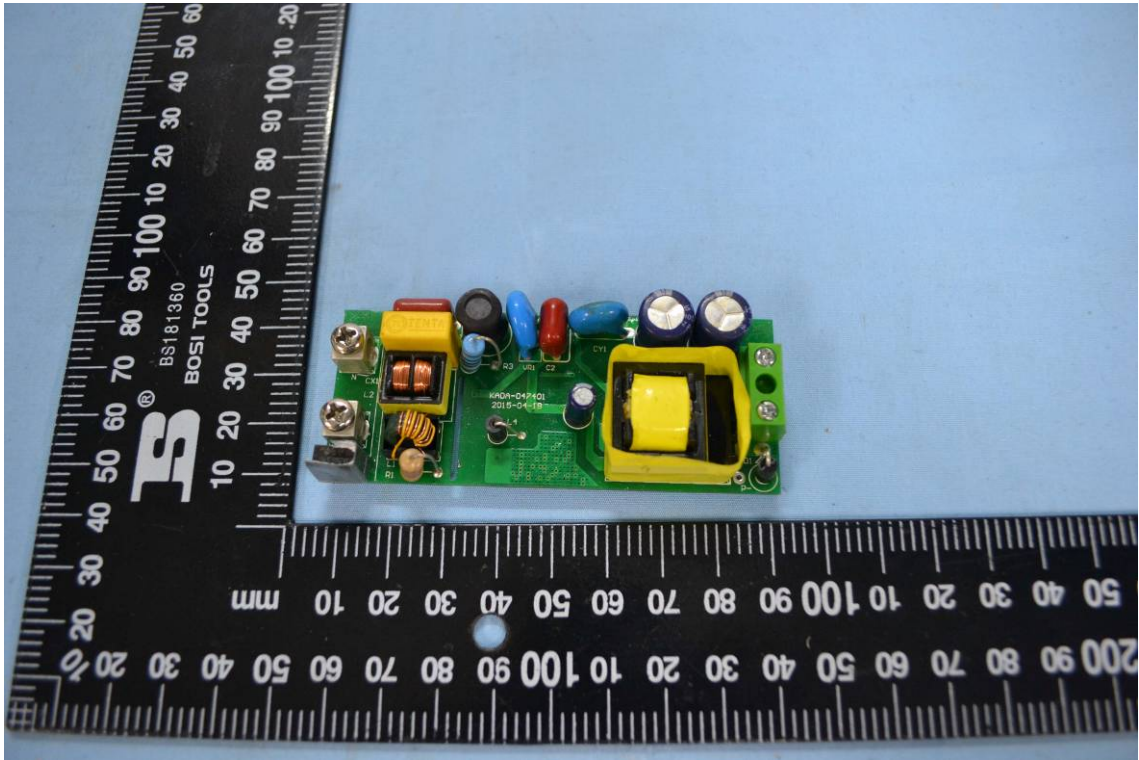
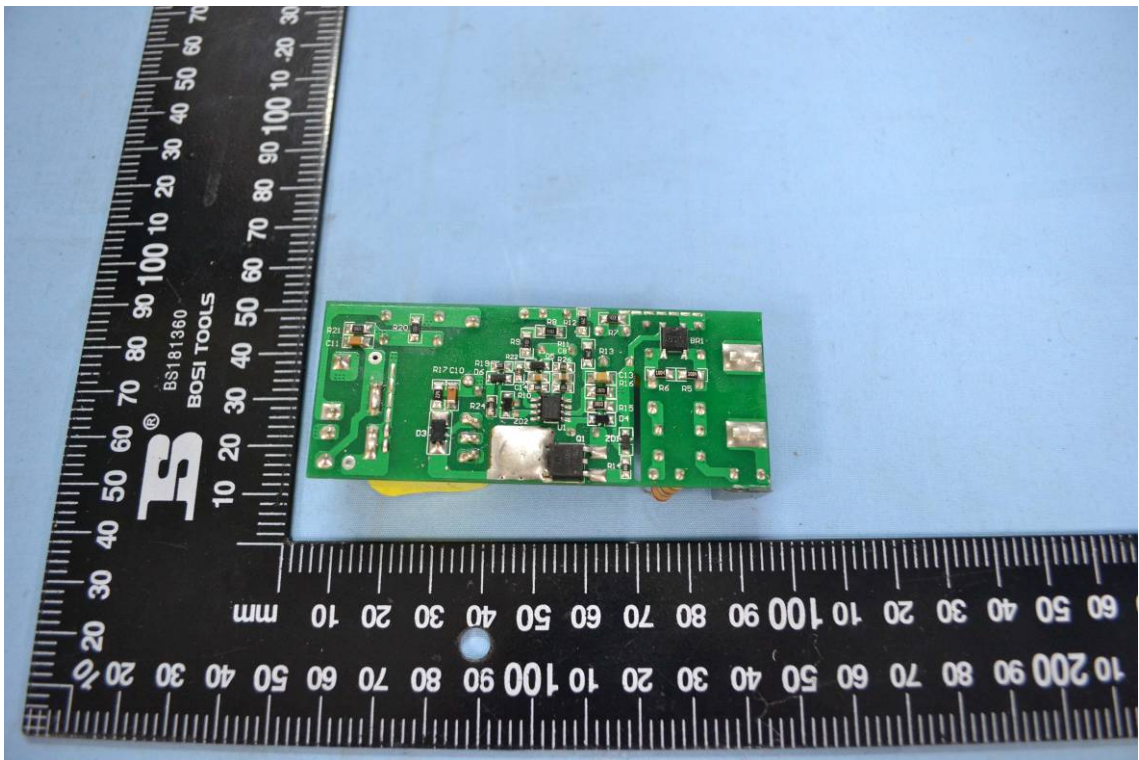


Photo 6



Model: EC013-0350-A01

Photo 1



Photo 2

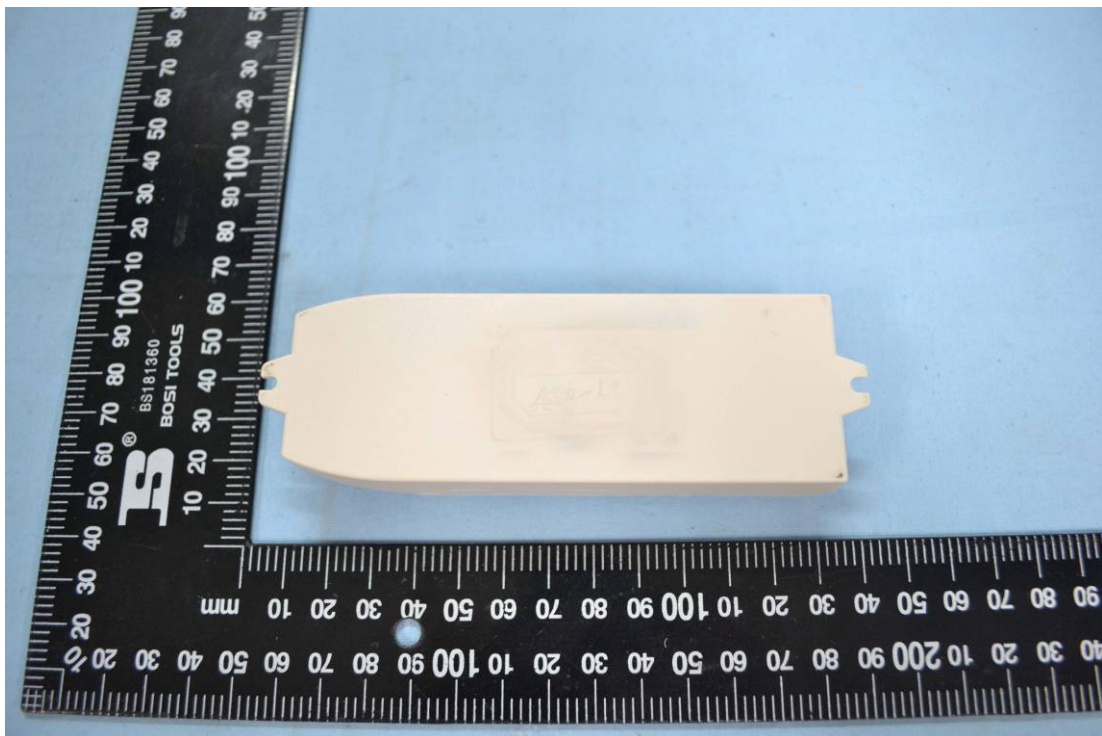


Photo 3



Photo 4

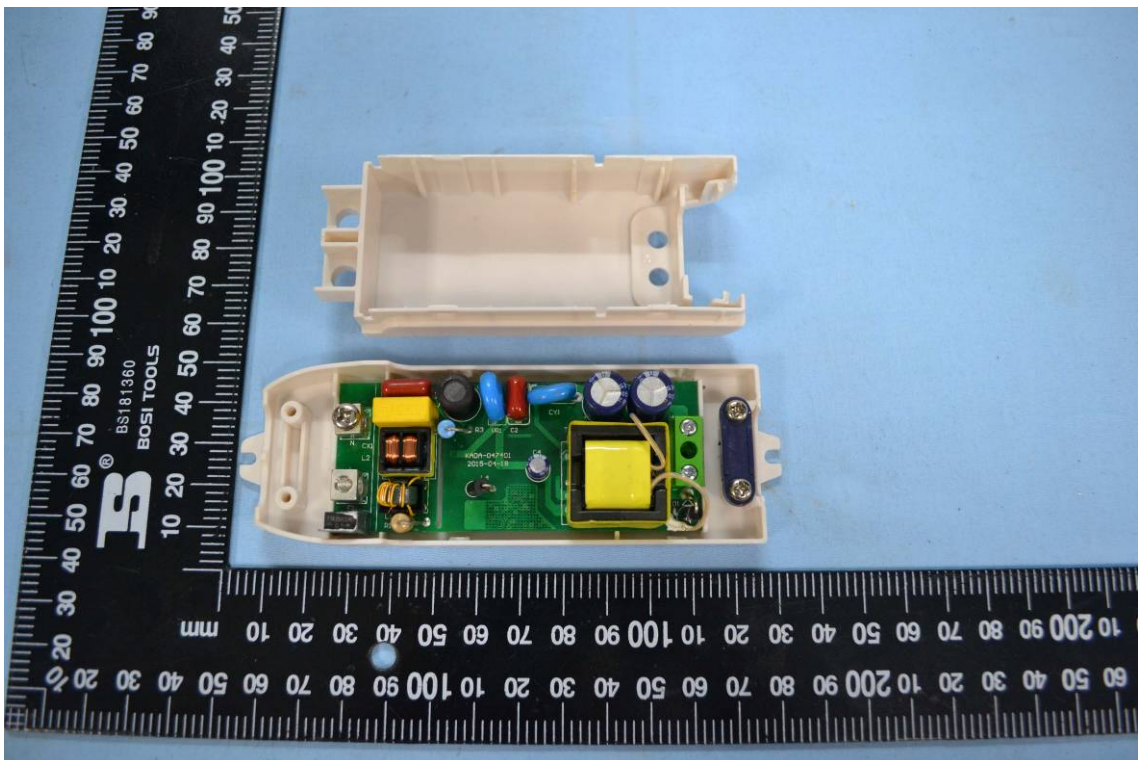


Photo 5

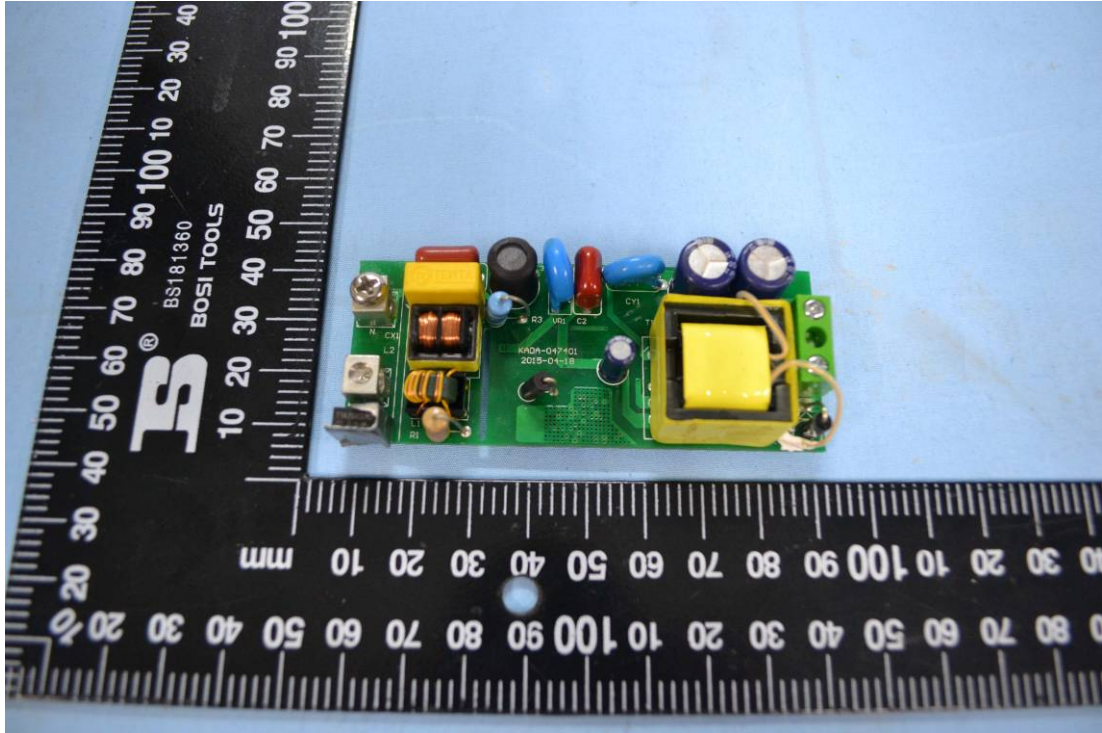
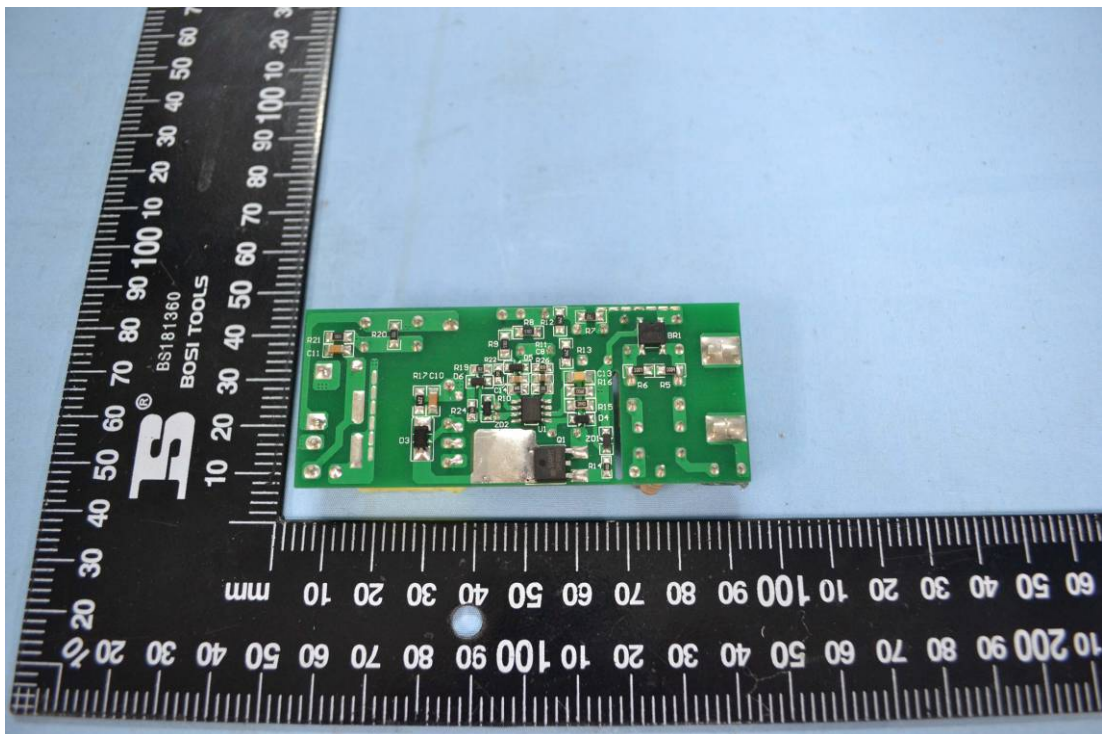


Photo 6



==== End of Report ====