


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.....	STR14078149S
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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 2nd 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 2nd Lane, Huasheng East Road, Caosan Industrial Park, Guzhen Town, Zhongshan City, Guangdong Province, P.R. China
Model/Type reference	E1A3-0270-01, E1A3-0270-02, E1A3-0270-03, E1A3-0270-04, E1A3-0320, E1A3-0240, E1A3-0350, E1A3-0220
Ratings	Input: 220-240V~, 50/60Hz, 0.08A Output: see model list
Note	N/A



Test item particulars:	
Type of controlgear.....	Independent
Supply Connection.....	Terminal block
Operating condition.....	Continuous
Class of equipment	Class II
Mass of equipment (g).....	0.084kg
Pollution degree	<input checked="" type="checkbox"/> PD 2 <input type="checkbox"/> 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.....	July 18, 2014
Date(s) of performance of tests.....	July 18, 2014 to August 15, 2014

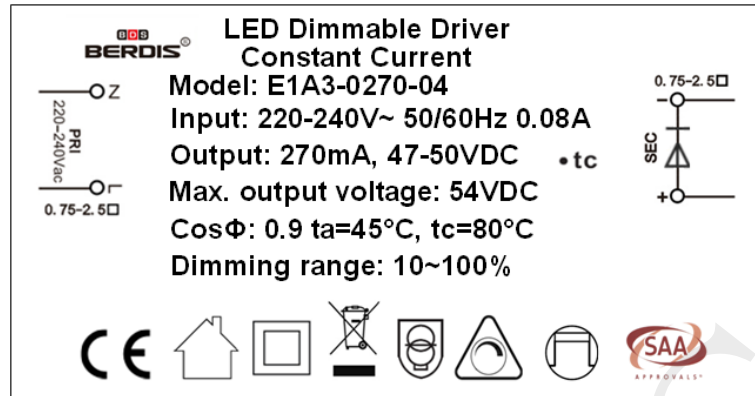
General remarks:
<p>The test results presented in this report relate only to the object tested.</p> <p>This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.</p> <p>"(see Enclosure #)" refers to additional information appended to the report.</p> <p>"(see appended table)" refers to a table appended to the report.</p> <p>Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.</p>


General product information:

Independent controlgear, non-inherently short circuit proof, constant current output, Class II, IP20, ta=45°C, tc=80°C (at the bottom of enclosure above transformer).

Model List and Different					
Model No.	Input Voltage and Frequency (Vac and Hz)	input current (A)	output voltage (V)	output current (mA)	operating in dimming circuit
E1A3-0270-01	220-240V, 50/60Hz	0.08	20-27	270	Yes
E1A3-0270-02			27-34		
E1A3-0270-03			35-42		
E1A3-0270-04			47-50		
E1A3-0320			20-27	249	
E1A3-0240			27-34		
E1A3-0350			42-50		
E1A3-0220			37-40		

Copy of the marking plate:



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 <input checked="" type="checkbox"/> No <input type="checkbox"/>		—
	Built-in controlgear: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		—
	Integral controlgear: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		—
	SELV-equivalent or isolating controlgear.....: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		—
	Auto-wound controlgear.....: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		—
	Independent SELV controlgear.....: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		—
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	80°C	P
	- symbol for declared temperature		N
	Constant voltage type: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		—
	- rated supply voltage (V):		N
	Constant current type: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		—
	- rated output current (A):		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) :	0.75-2.5 mm 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 : 0.19mA 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):		N
- (A3)	The voltage between the part concerned and any accessible part is measured and does not exceed 34 V (peak).....:	22.8V	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 μ F: voltage after 1 min (V): < 50 V:	X-cap. (C1)=0.01uF	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 Y1 Capacitor (C7) used	P
	- Capacitor complying with IEC 60384-14	Approved Y1 Capacitor (C7) used	P
	- Other components bridging the separating transformer complying with IEC 60065, clause 14		N
9 (8)	TERMINALS		N
	Screw terminals: compliance with Section 14 of IEC 60598-1	The terminal block approved	N
	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 table 14)	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	48.0 °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, Ø 0.8mm.	P
	- part; test temperature (°C).....:	Input terminal: 125°C, Ø 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	Enclosure, Input terminal and 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, Input terminal and 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-connecte d		hazard
BR1	0.9x220 =198V	1.1x240 =264V	X	--	Fuse open, BR1 damaged, no hazard.	No
U1 Pin 12-13	0.9x220 =198V	1.1x240 =264V	X	--	Unit shutdown immediately and recoverable, no damage	No
Q1 pin 2-3	0.9x220 =198V	1.1x240 =264V	X	--	Unit shutdown immediately and recoverable, no damage	No
Q1pin 1-3	0.9x220 =198V	1.1x240 =264V	X	--	Fuse open, Q1 damaged, no hazard.	No
Q1 pin 1-2	0.9x220 =198V	1.1x240 =264V	X	--	Fuse open, Q1 damaged, no hazard.	No
T1 pin 5-6	0.9x220	1.1x240	X	--	Unit shutdown immediately and	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
	=198V	=264V			recoverable, no damage	
E1	0.9x220 =198V	1.1x240 =264V	X	--	Unit shutdown immediately and recoverable, no damage	No
D3	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>5.0</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>6.3</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		—	—	—	—	—	—	—

IEC 61347-2-13							
Clause	Requirement + Test				Result - Remark		Verdict
rated pulse voltage (peak kV)	50	60	80	100	-	-	-
required minimum distances, clearances (mm)	75	90	130	170	-	-	-
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 <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Class II	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
I.3.2	a) non-inherently short circuit proof controlgear	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	b) non-inherently open circuit proof controlgear	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	c) inherently short circuit proof controlgear	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	d) inherently open circuit proof controlgear	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	e) fail safe controlgear	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	f) non-short-circuit proof controlgear	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	g) non-open-circuit proof controlgear	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
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(C7)	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	49.2K	P
	- Limit max _____ K	150K	P
	- Secondary winding _____ K	Same as primary winding	P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	- Limit max _____ K	Same as primary winding	P
	- External enclosure _____ K	31.6K	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 foil : >100 M Ω	P
	Metal parts of class II controlgear which are separated from live parts by basic insulation only and the body not less than 5 M Ω		N
	Metal foil in contact with the inner and outer surfaces of enclosures of insulating material not		N

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	less than 2 MΩ		
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 (C7) : measured CI&Cr 7.6mm, required: CI&Cr 6.0 mm; Transformer primary pin and sec. winding: measured CI. & Cr.: >10.0 mm, required CI. & Cr.: 6.0 mm	P
	b) measured values ≥ specified values (mm)		N
	c) measured values ≥ specified values (mm)	two layers insulation tape used	P
	2. Insulation between adjacent input circuits:		N

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	measured values \geq specified values (mm)		
	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.: 3.1mm Cr.: 3.1mm, Required Cl. & Cr.: 3.0 mm; L to N: measured Cl. & Cr.: 5.0mm, 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.: 6.3mm, 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: 0.93mm Required:0.8mm	P

15	TABLE: Annex I.6.2 Heating test, thermocouples			P
	Model No.:	E1A3-0270-04		—
	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	
Input terminal (J1)		27.9	20.4	105-45=60
PCB under BR1		44.4	38.9	130-45=85
Varistor (RV1)		36.2	32.7	85-45=40
X-cap. (C1)		43.5	37.7	100-45=55
L1 body		42.0	34.5	130-45=85
L3 body		39.1	36.3	130-45=85
E2 body		43.3	46.4	105-45=60
PCB near Q1		43.9	47.3	130-45=85
PCB near U1		39.5	43.3	130-45=85
Winding of Transformer (T1)		45.2	49.2	110-45=65
Core of Transformer (T1)		43.7	47.6	110-45=65
Bridge Cap. (C7)		33.1	36.2	125-45=80
PCB near D3		39.4	41.6	130-45=85
Electronic Cap. (E1)		26.4	29.4	105-45=60
Output terminal (J2)		17.1	20.3	105-45=60
Enclosure inside top near T1		27.4	30.3	--
Enclosure outside top near T1		21.8	23.5	80-45=35
Enclosure inside bottom near T1		39.2	42.5	--
Enclosure outside bottom near T1		29.5	31.6	80-45=35

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 : 60N, 0.25Nm Cord 0.75mm ² : 60N, 0.15Nm		P
	- torque test: torque (Nm):		P
	- displacement ≤ 2 mm	0.8mm, 0.8mm	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)					P
5	GENERAL NOTES ON TESTS					P
	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					P
	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					N
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					P
18.2.1	Parts of insulating material retaining current-carrying parts in position, glow-wire test 750 °C		transformer bobbin, terminal block (J1), terminal block (J2)			P
18.2.2	Parts of insulating material which do not retain live parts in position, glow-wire test 650 °C		Enclosure			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, terminal block (J1): No flame, terminal block (J2) : 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.	—	—	5.0	—	—	—	

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.	—	—	6.3	—	—	—
- 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	2.5	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	2.5	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.	—	—	3.6	—	—	—
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.	—	—	6.3	—	—	—
- 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: Vrms=250						

Appendix 3 Component list					P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity
Plastic Enclosure	SABIC INNOVATIVE PLASTICS US L L C	FR7 (GG) (tt)	V-0, 125°C, PC	UL94, UL746C	UL E121562
Input connector (J1)	Cixi Kefa Electronics Co., Ltd	KF126-5.0 KF126R-5.0	AC 250 V, 8A, T105	EN 60998-1	VDE 40038981
Fuse (F1)	Dongguan Reomax Electronics Co., Ltd.	TBP	AC 250V, T500mAL	IEC/EN 60127-1 IEC/EN 60127-3	VDE 40024768 UL E306095
Heat shrinkable tubing	Various	Various	600V, 125°C	UL 224	UL
Line choke (L1)	Various	Various	4.7mH	IEC/EN 61347-1 IEC/EN 61347-2-13	--
Line choke (L3)	Various	Various	4.7mH	IEC/EN 61347-1 IEC/EN 61347-2-13	--
Varistor (RV1)	Hongzhi Enterprises Ltd.	HEL-7D471K	AC 460V, 85°C	IEC 61051-1 IEC 61051-2	VDE 40008621
Bridge Diode (BR1)	Various	Various	1000V, 0.5A	--	--
X-capacitor (C1)	Dain Electronics Co., Ltd.	MPX, X2 type	275V, 0.01μF, 40/110/21C	IEC 60384-14 2ed	VDE 40018798
MOSFET (Q1)	Various	Various	Min. 4A, min. 650V	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested in the equipment
Electrolytic capacitor (E2)	Various	Various	63V, 220 μ F, 105°C	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested in the equipment
Transformer (T1)	Jiaming Da Electronic	TRPQ2016-001HR	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)	DONG GUAN YIDA INDUSTRIAL CO LTD	UEW/155	155°C	UL1446	UL E344055

object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity
--Triple insulation wire of transformer (T1)	Young Chang Silicone Co., Ltd.	STW-B	130°C	IEC 60950-1	VDE 40013359
--Insulation tape of transformer (T1)	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD	CT-280B	130°C	UL510	UL E165111
--Tubing of transformer (T1)	SHENZHEN WOER HEAT-SHRINKABLE MATERIAL CO LTD	WF	200°C, 600V	UL224	UL E203950
--Varnish	SUZHOU TAIHU ELECTRIC ADVANCED MATERIAL CO LTD	ET-90	180°C	ANSI/UL 1446	UL E228349
Bridge -Capacitor (C7)	JYH HSU ELECTRONICS LTD.	JD	AC 400V, 2200pF, 125°C, Y1 type	IEC 60384-14 2ed.	VDE 40038642
Alt.	JYA-NAY Co., Ltd.	JN	AC 250 V, 2200 pF, 25/125/21/A, Y1 type	IEC 60384-14 2ed.	VDE 40001831
PCB	GOLDENMAX INTERNATIONAL TECHNOLOGY LTD	ILM-R1	130°C, V-0	UL94, UL796	UL E224772
Output connector (J2)	Cixi Kefa Electronics Co., Ltd	KF126-5.0 KF126R-5.0	AC 250 V, 8A, T105	EN 60998-1	VDE 40038981

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

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, China

Technical information:

Rating: input: 220-240V~, 50/60Hz, 0.08A

Output: see below model list

Model List and Different					
Model No.	Input Voltage and Frequency (Vac and Hz)	input current (A)	output voltage (V)	output current (mA)	operating in dimming circuit
E1A3-0270-01	220-240V, 50/60Hz	0.08	20-27	270	Yes
E1A3-0270-02			27-34		
E1A3-0270-03			35-42		
E1A3-0270-04			47-50		
E1A3-0320			20-27	249	
E1A3-0240			27-34		
E1A3-0350			42-50		
E1A3-0220			37-40		

Independent controlgear, non-inherently short circuit proof, constant current output, Class II, IP20, ta=45°C, tc=80°C (at the bottom of enclosure above transformer).

Note: the LED driver has the dimming function, so when using, need the silicon controlled dimmer.

Safety Tips:

- Please keep this equipment away from humidity;
- The equipment relies upon the enclosure for protection against electric shock;
- for safety reason, the equipment should only be opened by qualified technician;
- If one of the following situations occurred, get the equipment checked by a qualified technician;
 - Liquid has penetrated into the equipment;
 - The equipment has been exposed to moisture;
 - The equipment does not work well or you can not get it work according to the user manual;
 - The equipment has dropped and damaged;
 - If the equipment has obvious sign of breakage.
- 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;
- The product only can connected to LED modules;
- Between the primary terminal and the secondary terminal satisfy reinforced insulation.

Appendix 6 | Photos (model: E1A3-0270-04)

Photo 1



Photo 2



Photo 3



Photo 4



Photo 5

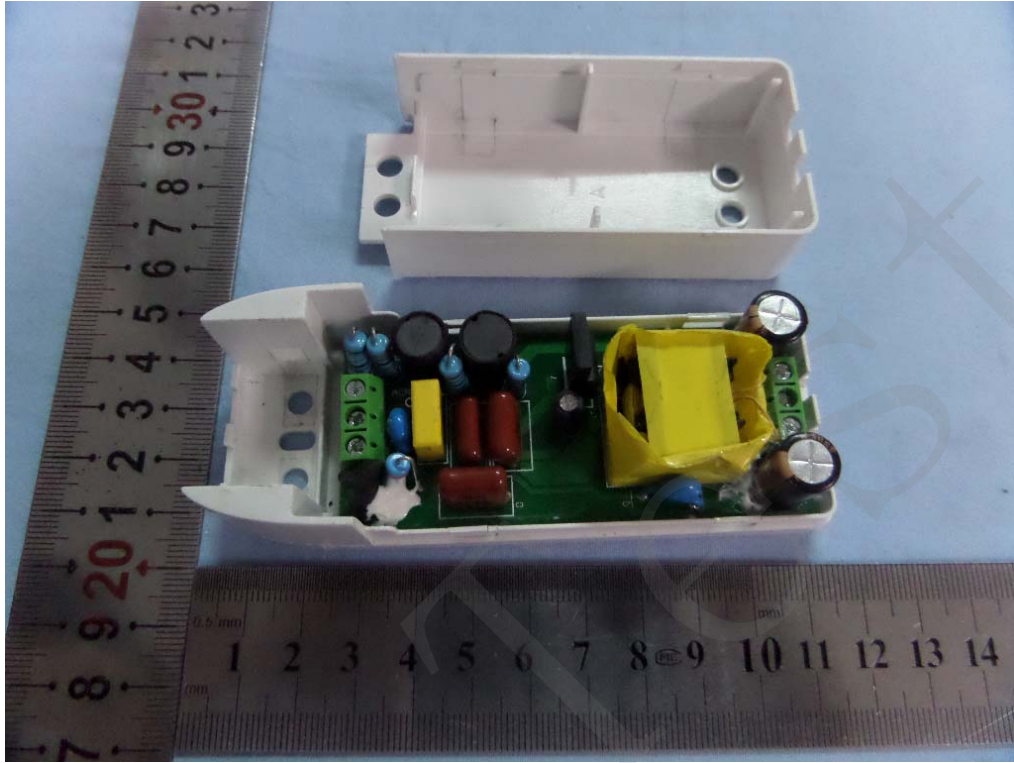


Photo 6

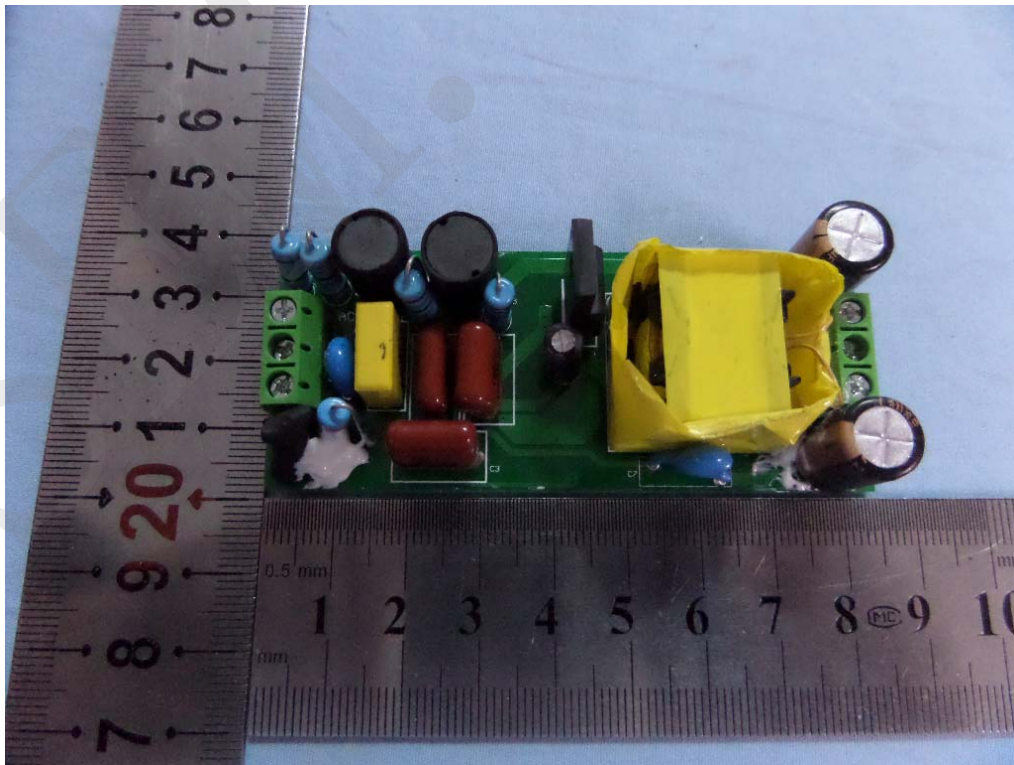


Photo 7

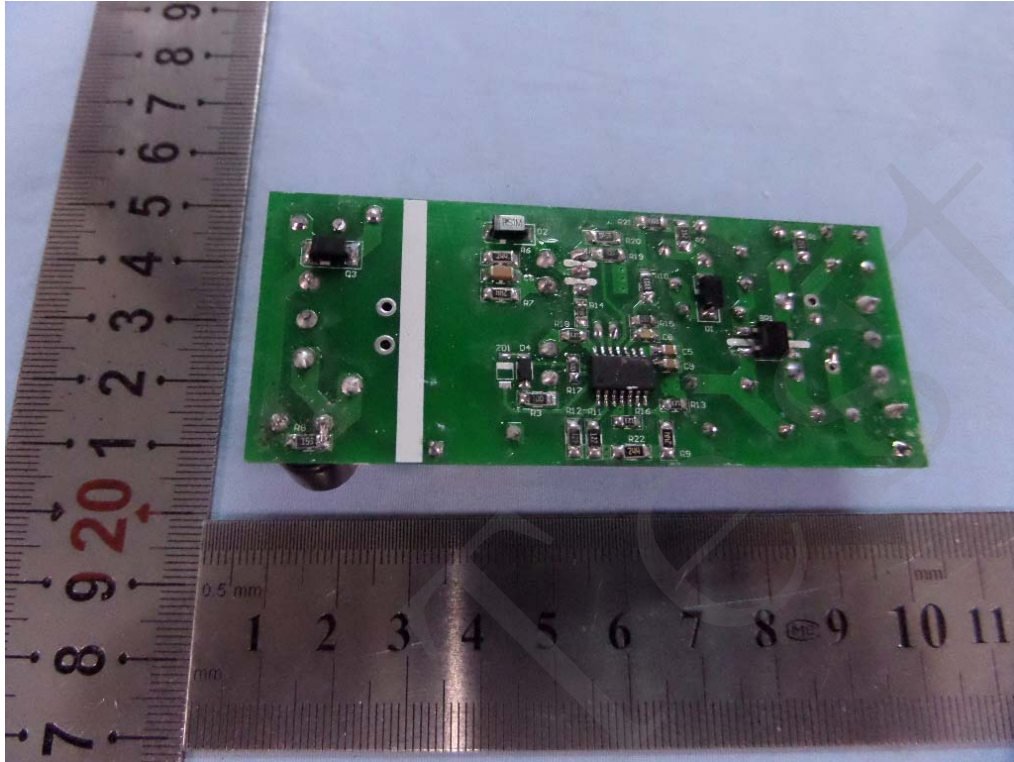


Photo 8

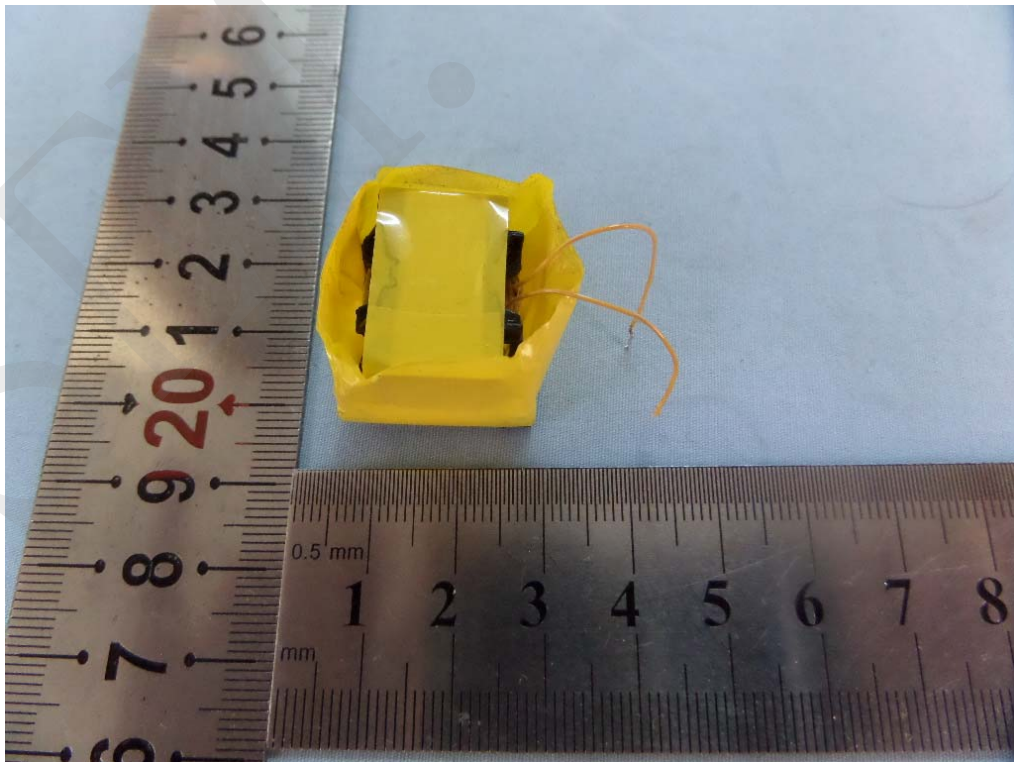


Photo 9

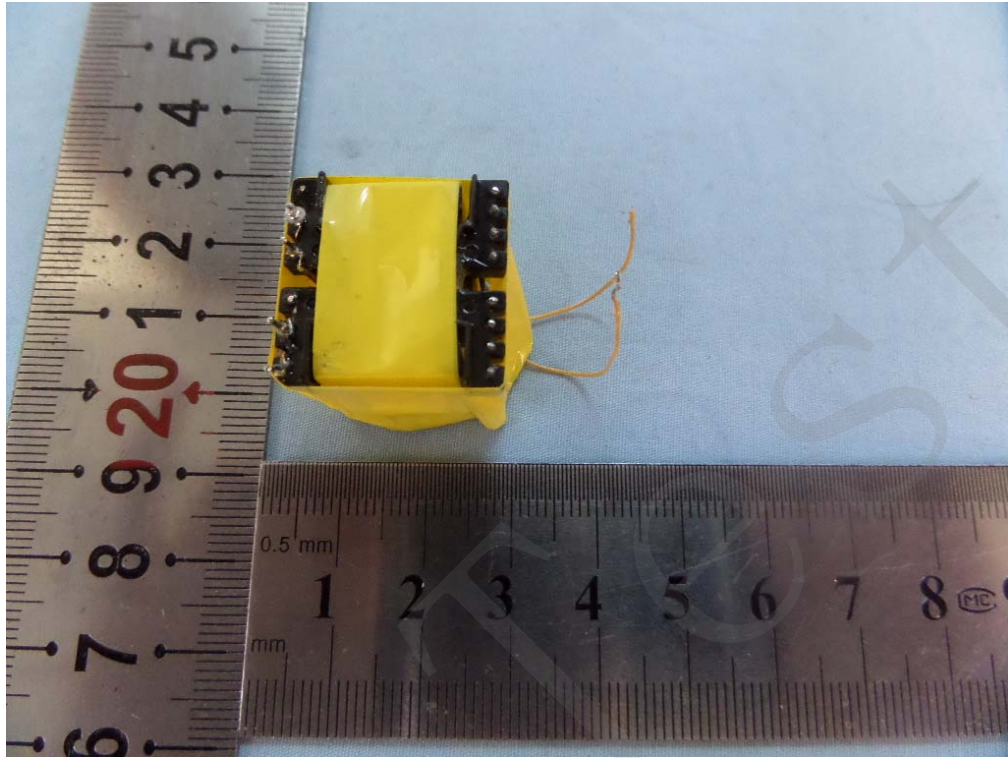


Photo 10

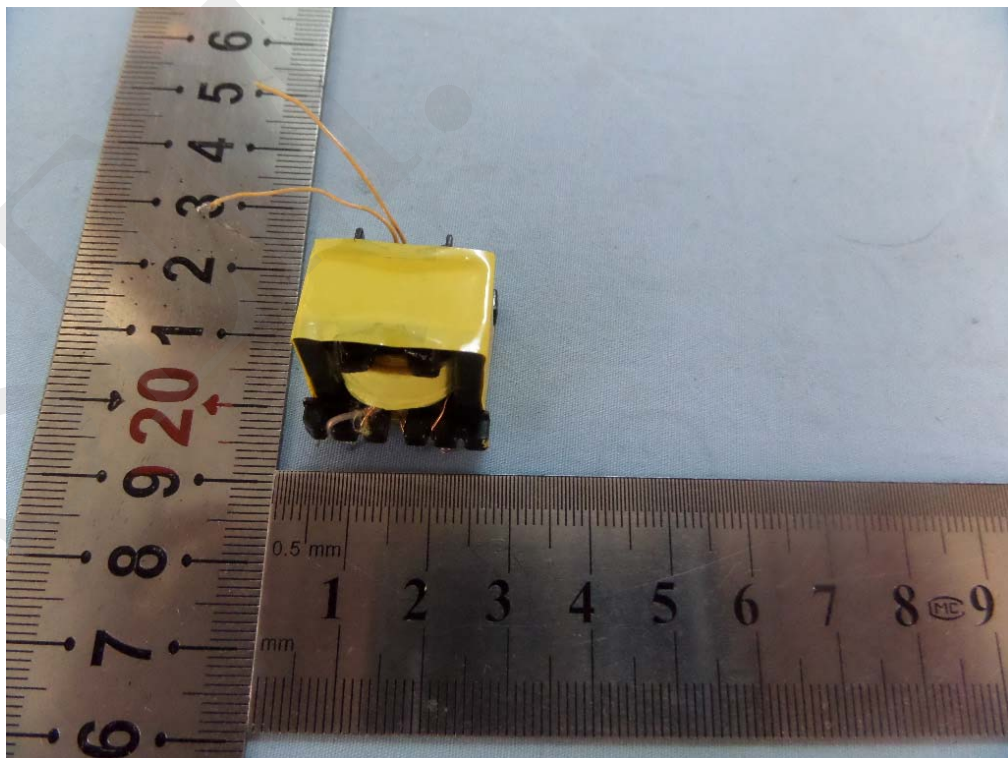


Photo 11

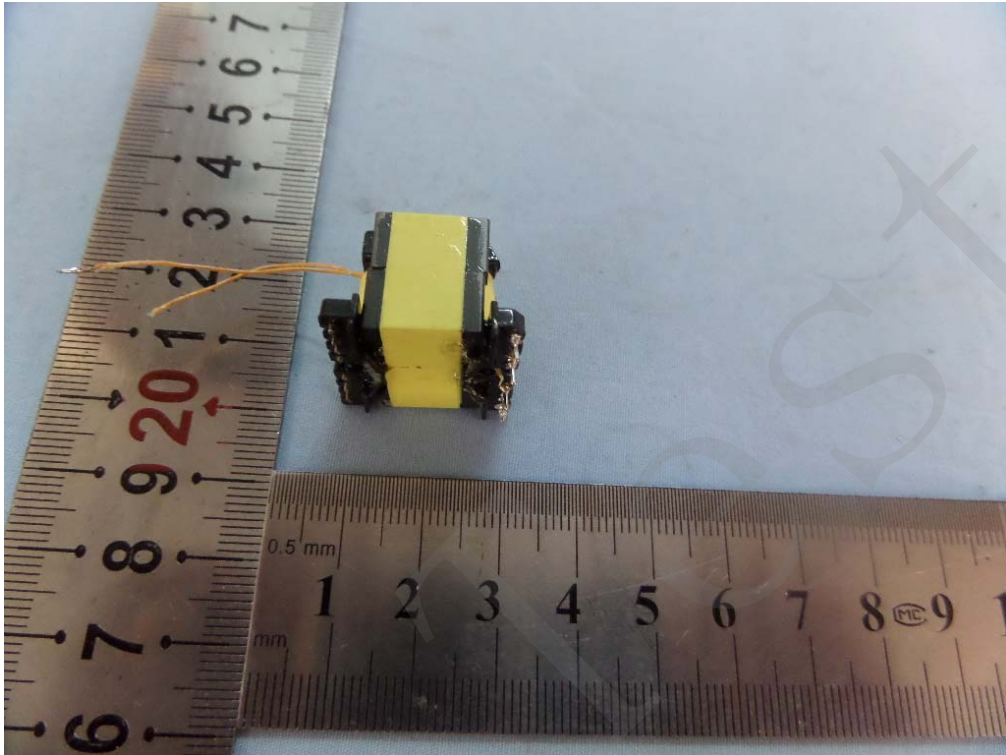


Photo 12

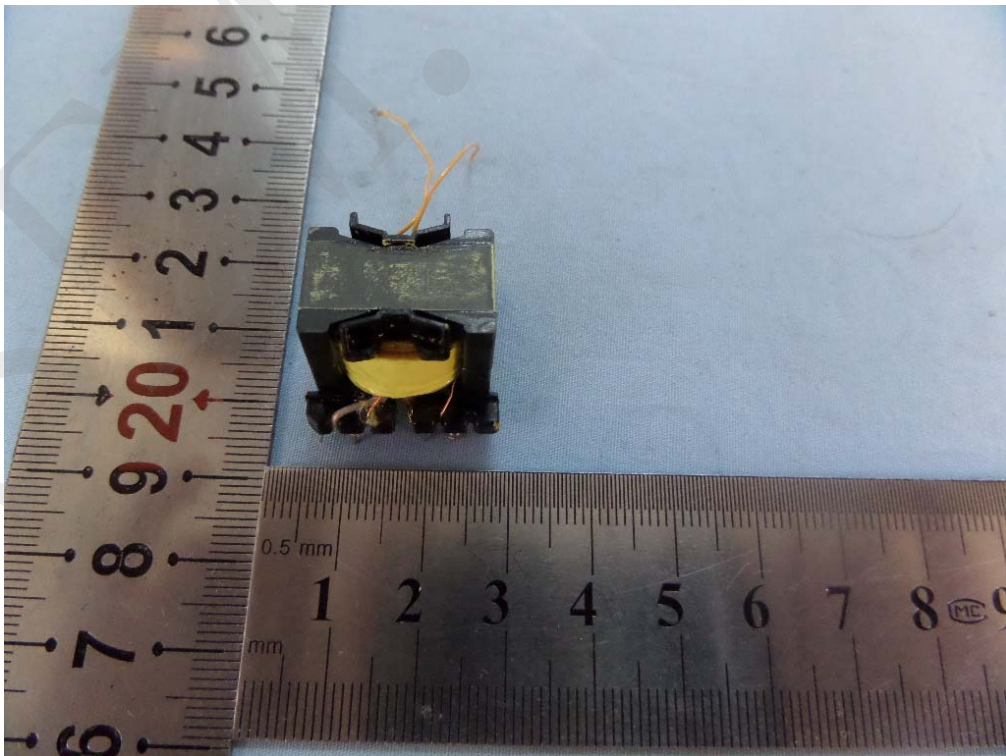


Photo 13

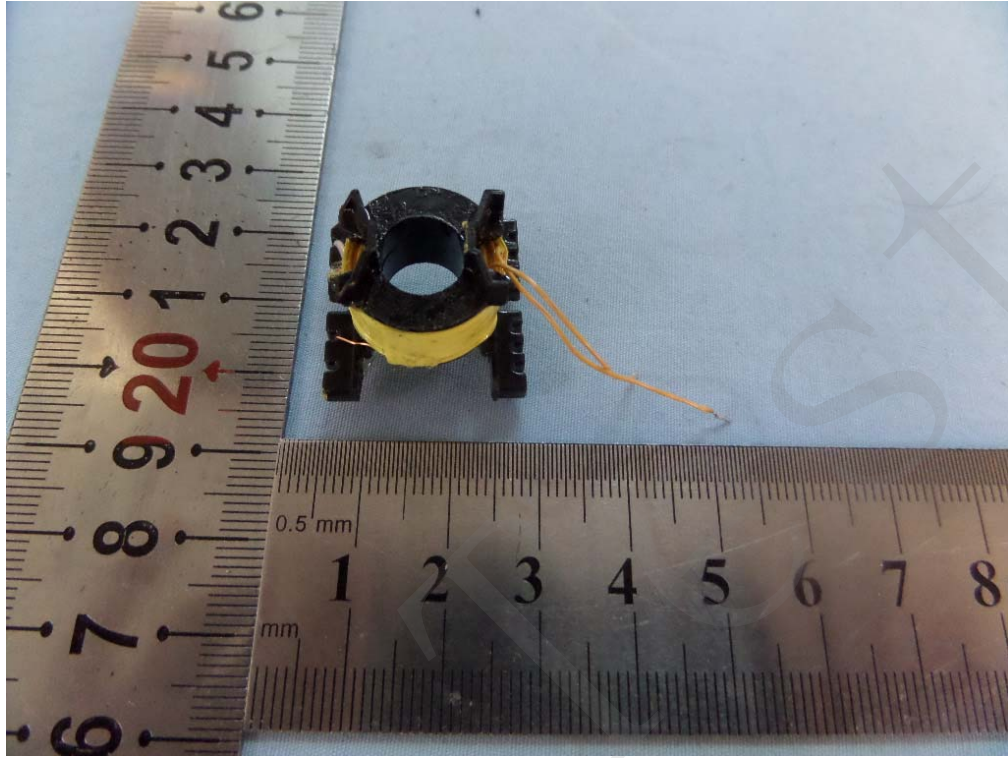


Photo 14

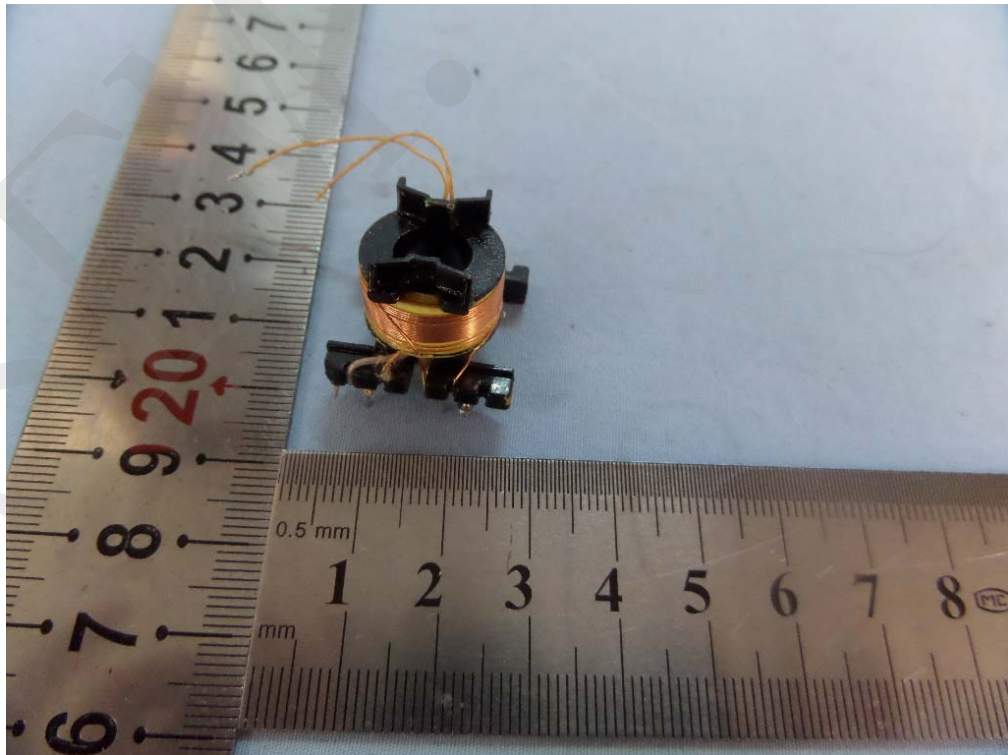


Photo 15



Photo 16

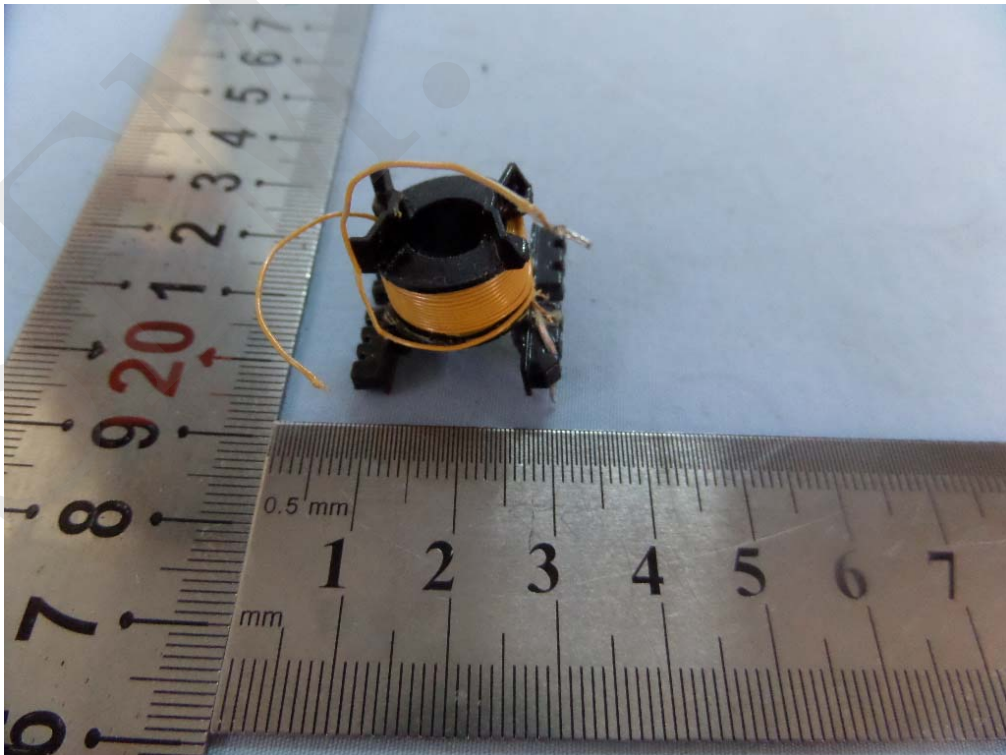


Photo 17



Photo 18

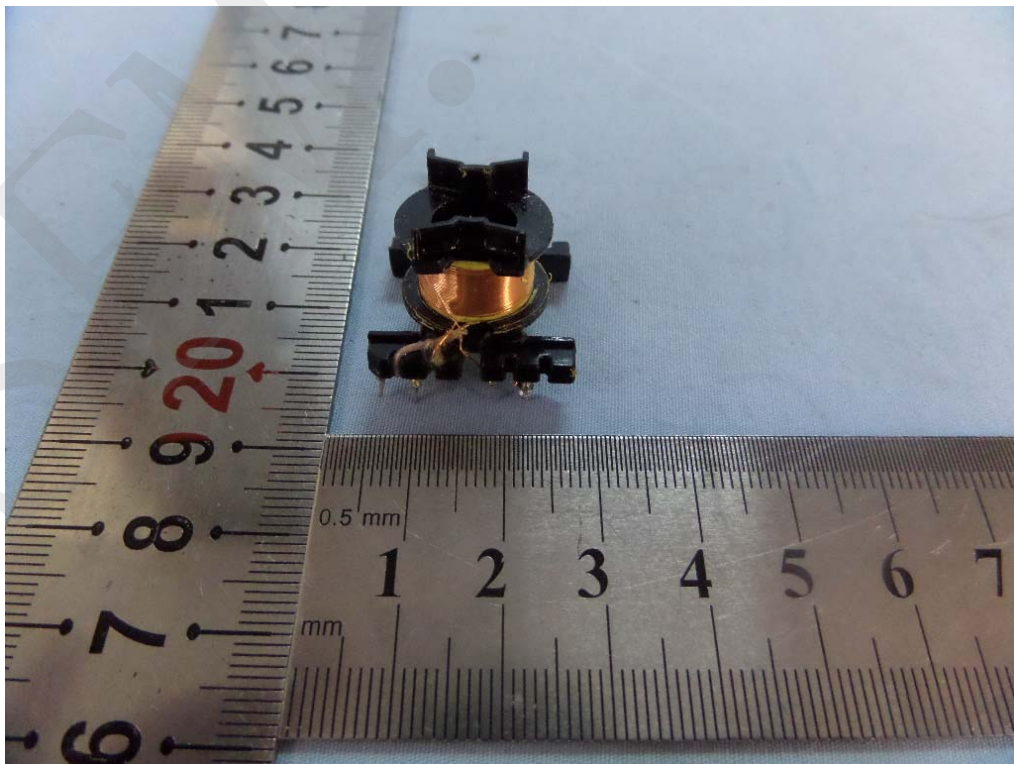


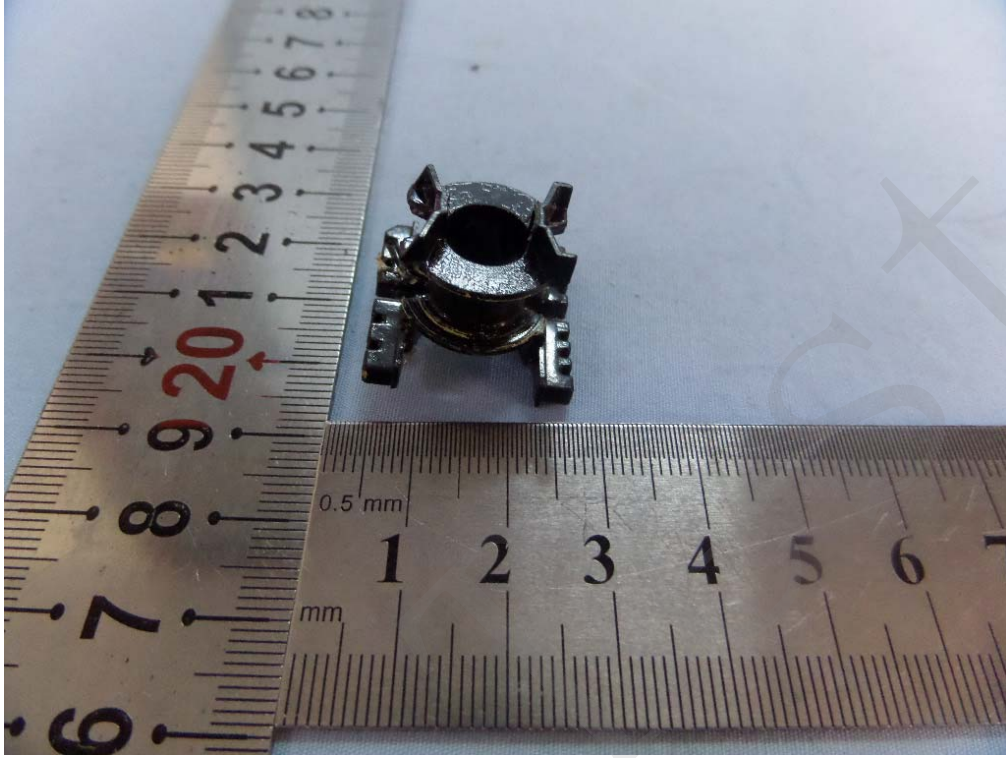
Photo 19



Photo 20



Photo 21



==== End of Report ====