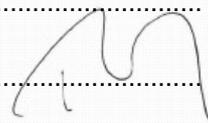




| TEST REPORT IEC 60968 and/or EN 60968 Self-ballasted lamps for general lighting services Safety requirements | |
|--|--|
| Report reference No. | 3007659.50-QUA/LI |
| Tested by (printed name and signature) | Cliff Fung  |
| Approved by (printed name and signature) | Roy Yip  |
| Date of issue | 2011-03-11 |
| Testing Laboratory Name | DEKRA Certification Hong Kong Limited |
| Address | Unit 1-14, 6/F., Fuk Shing Commercial Building, 28 on Lok Mun Street, On Lok Tsuen, Fanling, N.T. Hong Kong |
| Testing location | CBTL <input checked="" type="checkbox"/> CCATL <input type="checkbox"/> SMT <input type="checkbox"/> TMP <input type="checkbox"/> |
| Address | as above |
| Applicant's Name | Matrix Lighting Limited |
| Address | Room 223-231, 2/F., East Wing, Tsim Sha Tsui Centre, 66 Mody Road, Tsim Sha Tsui East, Kowloon, Hong Kong |
| Test specification | |
| Standard | IEC 60968:88 (1 st Edition) + A1:91 + A2:99 and EN 60968:90 (1 st Edition) + A1:93 + A2:99 + Australia national deviation (AS/NZS 60968: 2001) |
| Test procedure | CB |
| Non-standard test method | N/A |
| Test Report Form No. | IECEN60968A |
| TRF originator | SGS Fimko Ltd |
| Master TRF | dated 2002-01 |
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| | |
|------------------------------------|---|
| Test item description | LED Spot Light |
| Trademark | VIRIBRIGHT |
| Manufacturer | same as applicant |
| Factory..... | 1) Zhong Shan Ban Fu Micami Toys Factory Sha Guo Industrial Zone, Ban Fu Country, ZhongShan City, Guangdong Province, China 2) ZhongShan Wei Heng Plastic Industry Co.,Ltd. 172 North Banfu Road, Banfu town, Zhongshan, Guangdong, China |
| Model and/or type reference | 1)50-45BEU, 2) 50-45EEU, 3) 50-45GEU |
| Rating(s) (V; Hz)..... | 220-240 Vac, 50 Hz, 27 mA, 4,5 W, |
| | 1) B22, 2) E27, 3) GU10 |

Copy of marking plate

| | |
|---|--|
|  |    |
| | Model#: 50-45BEU 220-240VAC 50Hz 27mA LED Spot Light Made In China Z1108 4.5W B22 CW |
|  |    |
| | Model#: 50-45EEU 220-240VAC 50Hz 27mA LED Spot Light Made In China Z1108 4.5W E27 CW |
|  |    |
| | Model#:50-45GEU 220-240VAC 50Hz 27mA LED Spot Light Made In China Z1108 4.5W GU10 CW |

Summary of testing

Full test according IEC/EN 60968 except cl. 12 with additionally cl. 13, 15,16,17,19 of IEC/EN 62031, IEC/EN 62471 and IEC/EN 60061-1 sheets 7004-10-6 (B22), 7004-21-9 (E27), 7004-23-6 (E14). and 7004-121-1 (GU10)

The self-ballasted LED lamps were tested according IEC/EN 62471. The model: 50-45EEU is selected for the test, which can represent all models. Model: 50-45EEU has been classified as Exempt Group.

Test items particulars:

Lamp cap: E27/ B22 / GU10
Lamp identification: LED
Commission received from: -
Date: 2011-03-11
Electrical safety class: II
IP number: IP20
.....:

Test case verdicts

Test case does not apply to the test object ...: N/A
Test item does meet the requirement: P(ass)
Test item does not meet the requirement: F(ail)

Testing

Date of receipt of test item: 2011-01-03 – 2011-02-25
Date(s) of performance of test: 2011-01-03 – 2011-03-09

General remarks

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by a NCB in accordance with IEC 60364-4-41.

This report shall not be reproduced except in full without the written approval of the testing laboratory. The test results presented in this report relate only to the item(s) tested.

"(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.

The product complied with the following standards:

- IEC 60968:88 (1st Edition) + A1:91 + A2:99;
- EN 60968:90 (1st Edition) + A1:93 + A2:99;
- IEC/EN 62031:2008 (the following clauses are applicable – 13, 15, 16, 17, 19)
- IEC 62471: 2006;
- EN 62471:2008;
- IEC/TR 62471-2:2009
- Australia national deviation (AS/NZS 60968: 2001)

General product information:

Self-ballasted LED lamps with B22/E27/GU10 cap.

Each model has three different colour temperature: warm white (2900K), natural white (4200K) and cool white (5500K).

All models contained similar construction, the differences between each model are the lamp cap only.

| IEC 60968 and/or EN 60968 | | | |
|---------------------------|---|-----------------|---------|
| Clause | Requirement – Test | Result - Remark | Verdict |
| | SAFETY REQUIREMENTS | | P |
| 4 | MARKING | | P |
| 4.1 | 1) Mark of origin | | P |
| | 2) Rated voltage/voltage range (V) | | P |
| | 3) Rated wattage (W) | | P |
| | 4) Rated frequency (Hz) | | P |
| 4.2 | 1) Lamp current (A) | | P |
| | 2) Burning position if restricted | | N/A |
| | 3) The mechanical stress caused by the weight of the lamp in the luminaire | | N/A |
| | 4) Special conditions or restrictions observed for lamp operation; operation in dimming circuits | | N/A |
| | Not suitable for dimming; symbol used  | | N/A |
| 4.3 | 1) Presence and legibility of the marking by visual inspection | | P |
| | 2) The durability of the marking is checked by rubbing lightly with water and hexane for 15 s | | P |
| | 3) Availability of information by visual inspection | | P |
| 5 | INTERCHANGEABILITY | | P |
| 5.1 | Interchangeability shall be ensured by the use of caps in accordance with IEC 60061-1 | B22, E27, GU10 | P |
| 5.2 | Compliance of the combination of cap and bulb is checked by the use of gauges | | P |
| | B22d or B15d: | | P |
| | A max. and A min. gauge 7006-10/11 | | P |
| | D1 max. gauge 7006-10/11 | | P |
| | N min. gauge 7006-10/11 | | P |
| | Diametrical position of the pins: | | P |
| | Insertion in lampholder gauge 7006-4A | | P |
| | Retention in lampholder gauge 7006-4B | | P |
| | E27: | | P |
| | Max. dimension of the screw thread gauge 7006-27B | | P |

| IEC 60968 and/or EN 60968 | | | |
|---------------------------|--|-------------------------------|---------|
| Clause | Requirement – Test | Result - Remark | Verdict |
| | Min. major diameter of the screw thread gauge 7006-28A | | P |
| | Contact making gauge 7006-50 | | P |
| | E26: | | N/A |
| | Max. dimensions of the screw thread 7006-27D | | N/A |
| | Max. major diameter of the screw thread 7006-27E | | N/A |
| | E14: | | N/A |
| | Max. dimensions of the screw thread 7006-27F | | N/A |
| | Min. major diameter of the screw thread 7006-28B | | N/A |
| | Contact making 7006-54 | | N/A |
| 5.3 | Mass not exceeding 1 kg | Max. weight, 50-45EEU: 49,1 g | P |
| | Bending moment not exceeding 2 Nm | < 2 Nm | P |

| | | | |
|---|--|--|-----|
| 6 | PROTECTION AGAINST ELECTRIC SHOCK | | P |
| | Lamps shall be so constructed that no internal metal parts or live parts are accessible, when the lamps is installed in a prescribed lampholder. Compliance is checked by means of the standard test finger with force of 10 N | | P |
| | Edison screw caps compliance with gauge IEC 60061-3, sheet 7006-51A for E27 caps | | P |
| | and sheet 7006-55 for E14 caps | | N/A |
| | B22 or B15 caps compliances with normal incandescent lamps | | P |
| | External metal parts shall be so designed that live parts are not accessible (test of Cl. 7) | | P |

| | | | |
|-----|---|------------------|-----|
| 7 | INSULATION RESISTANCE AND ELECTRIC STRENGTH AFTER HUMIDITY TREATMENT | | P |
| 7.1 | After storage 48 h at a 91...95 % relative humidity and at 20...30 °C | | P |
| | Insulation resistance with 500 V d.c., required $\geq 4 \text{ M}\Omega$. | > 100 M Ω | P |
| 7.2 | Immediately after the insulation resistance test, electric strength test for 1 min. | | P |
| | Type HV (220 ... 250 V): 4000 V rms | | P |
| | Type BV (100 ... 120 V): $2xU + 1000 \text{ V}$ | | N/A |
| | No flashover or breakdown | | P |

| IEC 60968 and/or EN 60968 | | | |
|---------------------------|--|-----------------|---------|
| Clause | Requirement – Test | Result - Remark | Verdict |
| 8 | MECHANICAL STRENGTH | | P |
| | Torsion resistance | | P |
| | The cap is remain firmly attached when subjected to torque levels | | P |
| | - B22d3 Nm : | | P |
| | - B15d1,15 Nm: | | N/A |
| | - E26 and E273 Nm: | | P |
| | - E141,15 Nm: | | N/A |
| | Torque increased continuously from zero to specified value | | P |
| | Uncemented caps; relative movement between cap and bulb does not exceed 10 | | P |
| | After mechanical strength test sample complies requirements of accessibility | | P |

| | | | |
|---|---|--------|-----|
| 9 | CAP TEMPERATURE RISE | | P |
| | Cap temperature rise ΔT_S not exceeding the condition specified in IEC 60360: | | P |
| | - B22d 125 K: | 19,7 K | P |
| | - B15d 120 K: | | N/A |
| | - E27 120 K: | 21,3 K | P |
| | - E14 120 K: | | N/A |
| | - GU10 120 K: | 19,5 K | P |
| | - E26under consideration | | N/A |

| | | | |
|----|---|-------------------------------------|---|
| 10 | RESISTANCE TO HEAT | | P |
| | External parts of insulating material providing protection against electric shock, and parts of insulating material retaining live parts in position, ball pressure test: | | P |
| | Part tested; temperature (C);diameter of impression (≤ 2 mm) | PCB; 125 °C; 0,83mm | P |
| | Part tested; temperature (C); diameter of impression (≤ 2 mm) | Enclosure; 83,1 °C; 1,29mm | P |
| | Part tested; temperature (C); diameter of impression (≤ 2 mm) | Lamp cap; 125 °C; 0,97mm | P |
| | Part tested; temperature (C); diameter of impression (≤ 2 mm) | Plastic holding LED; 125 °C; 1,05mm | P |

| | | | |
|----|----------------------------------|--|---|
| 11 | RESISTANCE TO FLAME AND IGNITION | | P |
|----|----------------------------------|--|---|

| IEC 60968 and/or EN 60968 | | | |
|---------------------------|---|-----------------------------|---------|
| Clause | Requirement – Test | Result - Remark | Verdict |
| | Parts of insulating material retaining live parts in position and external parts of insulating material providing protection against electric shock, glow-wire test 650 C | | P |
| | Part tested; temperature (C) | PCB; 650 °C | P |
| | Part tested; temperature (C)..... | Enclosure; 650 °C | P |
| | Part tested; temperature (C)..... | Lamp cap; 650 °C | P |
| | Part tested; temperature (C) | Plastic holding LED; 650 °C | P |
| | No visible flame and no sustained glowing | | P |
| | Flames and glowing, extinguish within 30 s | | N/A |
| | No ignition of the tissue paper | | P |

| | | | |
|----|--|--|-----|
| 12 | FAULT CONDITIONS | | N/A |
| | a) In a switch-start circuit, the starter is short-circuited | | N/A |
| | b) Short-circuit across capacitors | | N/A |
| | c) The lamp does not start, because one of the cathodes is broken | | N/A |
| | d) The lamp does not start, although the cathode circuits are intact (de-activated lamp) | | N/A |
| | e) The lamp operates, but one of the cathodes is de-activated or broken (rectifying effect) | | N/A |
| | f) Opening or bridging other points in the circuit where the diagram indicates that such a fault condition may impair safety | | N/A |

| | | | |
|---------------|--|--|-----|
| | COMMON MODIFICATIONS (EN 60968:1990) | | N/A |
| 5, 6, 8 and 9 | Delete all references to E26 lamp caps | | N/A |

| 12 | TABLE : tests of fault conditions (Refer cl.13 of IEC 62031) | | | | | |
|------|--|--------------------|-----------------|---------------|--|--------|
| part | 0,9xU _n | 1,1xU _n | short-circuited | dis-connected | | Hazard |
| | | | | | | |

| IEC 60968 and/or EN 60968 | | | |
|---------------------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|--|--|--|---|
| ANNEX 1 : Additional requirement of IEC 62031 | | | — |
|--|--|--|---|

| | | | |
|-------------|---|----------------------|-----|
| 13 | FAULT CONDITIONS | | P |
| 13.1 | In compliance with IEC 61347-1 (clause numbers between parentheses refer to IEC 61347-1) | | P |
| | When operated under fault conditions the LED-module: | | P |
| | - does not emit flames or molten material | | P |
| | - does not produce flammable gases | | P |
| | - protection against accidental contact not impaired | | P |
| | Thermally protected controlgear does not exceed the marked temperature value | | N/A |
| | Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected | (see appended table) | P |
| - (14.1) | Short-circuit of creepage distances and clearances if less than specified in clause 16 in Part 1 (except between live parts and accessible metal parts) | (see appended table) | N/A |
| | Distances on printed boards provided with coating according to IEC 60664-3 | | N/A |
| - (14.2) | Short-circuit or interruption of semiconductor devices | (see appended table) | P |
| - (14.3) | Short-circuit across insulation consisting of lacquer, enamel or textile | (see appended table) | N/A |
| - (14.4) | Short-circuit across electrolytic capacitors | (see appended table) | P |
| - (14.5) | During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite | | P |
| | After the tests the insulation resistance with d.c. 500 V (MΩ) are ≥ 1 MΩ | | P |
| | Temperature declared thermally protected LED-modules fulfil the requirements in Annex C of IEC 61437-1 | | N/A |
| 13.2 | Module withstands overpower condition >15 min. | | N/A |
| | Module with automatic protective device or power limiter, test performed 15 min. at limit. | | N/A |
| | During the tests, tissue paper, spread below module, does not ignite | | N/A |

| | | | |
|-----------|---|--|---|
| 15 | CONSTRUCTION | | P |
| | Wood, cotton, silk, paper and similar fibrous material not used as insulation | | P |

| IEC 60968 and/or EN 60968 | | | |
|---------------------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|--|--|--|---|
| ANNEX 1 : Additional requirement of IEC 62031 | | | — |
|--|--|--|---|

| | | | |
|-----------|--|--|-----|
| 16 | CREEPAGE DISTANCES AND CLEARANCES | | P |
| | Creepage and distances and clearances in compliance with IEC 60598-1 | | P |
| | Class of protection | Class II | — |
| | Working voltage (V) | 220-240 | — |
| | Voltage form | Sinusoidal | — |
| | PTI | < 600 | — |
| | Rated pulse voltage (kV) | - | — |
| | (1) Live parts of different polarity: cr (mm); cl (mm) | Cr > 2,5 mm Cl > 1,5 mm | P |
| | (2) Live parts and accessible parts: cr (mm); cl (mm) | Primary to Accessible part: Cr > 5 mm; Cl > 3 mm Primary to Secondary: Cr > 5 mm; Cl > 3 mm | P |
| | (3) Parts becoming live: cr (mm); cl (mm) ... : | Cr > 2,5 mm Cl > 1,5 mm | P |
| | (4) Outer surface of cable: cr (mm); cl (mm) : | | N/A |
| | (5) Live parts of switches: cr (mm); cl (mm) : | | N/A |
| | (6) Live parts and supporting surface: cr (mm); cl (mm) | Cr > 5 mm Cl > 3 mm | P |

| | | | |
|----------------|---|---------|-----|
| 17 (17) | SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS | | P |
| | Screws, current-carrying parts and connections in compliance with IEC 60598-1 (clause numbers between parentheses refer to IEC 60598-1) | | P |
| (4.11) | Electrical connections: | | P |
| (4.11.1) | Contact pressure | | P |
| (4.11.2) | Screws: | | N/A |
| | - self-tapping screws | | N/A |
| | - thread-cutting screws | | N/A |
| | - at least two self-tapping screws | | N/A |
| (4.11.3) | Screw locking: | | N/A |
| | - spring washer | | N/A |
| | - rivets | | N/A |
| (4.11.4) | Material of current-carrying parts | | P |
| (4.11.5) | No contact to wood | No wood | N/A |

| IEC 60968 and/or EN 60968 | | | |
|---------------------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|--|--|--|---|
| | ANNEX 1 : Additional requirement of IEC 62031 | | — |
|--|--|--|---|

| | | | |
|----------|--|--|-----|
| (4.12) | Mechanical connections and glands: | | P |
| (4.12.1) | Mechanical stress | | P |
| | Screws not made of soft metal | | N/A |
| | Screws of insulating material | | N/A |
| | Torque test: part; torque (Nm) : | | N/A |
| | Torque test: part; torque (Nm) : | | N/A |
| | Torque test: part; torque (Nm) : | | N/A |
| (4.12.2) | Screw diameter < 3 mm screwed into metal | | N/A |
| (4.12.3) | Void | | — |
| (4.12.4) | Locked connections | | N/A |
| (4.12.5) | Screwed glands: force (N) : | | N/A |

| | | | |
|-----------|--|--|-----|
| 19 | RESISTANCE TO CORROSION | | N/A |
| | Resistance to corrosion in compliance with IEC 61347-1 | | N/A |
| | Rust protection: | | N/A |
| | - test according 4.18.1 of IEC 60598-1 | | N/A |
| | - adequate varnish on the outer surface | | N/A |

| | | | |
|-----------|---|------------------|--------|
| 14 | TABLE: tests of fault conditions | | P |
| Part | Simulated fault | | Hazard |
| C1 | Short-circuited | Fuse operated | NO |
| C2 | Short-circuited | LED switched off | NO |
| C5 | Short-circuited | LED switched off | NO |
| RV1 | Short-circuited | Fuse operated | NO |

| | | |
|--|----------------------------|--|
| | ANNEX 2: Components | |
|--|----------------------------|--|

| object/part No. | code | manufacturer/ trademark | type/model | technical data | standard | mark(s) of conformity |
|-----------------|------|---|-----------------|----------------------------------|-----------------------------|--------------------------|
| X2 Capacitor | B | Shenzhen Su Rong | MPX/MKP | AC 280 V; 0,1 μ F; 100 °C | IEC / EN 60384-14 | VDE |
| Varistor | B | Brightking (Shenzhen) Co. Ltd. / Jinbaoge | 471KD07 | 2,5 A; -40°C to +85°C | IEC 61051-1; IEC 61051-2 | VDE |
| PCB | C | - | JD-F | FR4 | IEC / EN 60968 | Test with appliance |
| LED | C | - | ES- CEDBV10F | InGaN Venus Blue LED Chip | IEC / EN 60968 | Test with appliance |

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

| | | | |
|-------------|---|--|-----|
| ZC | ANNEX ZC, NATIONAL DEVIATIONS (AUS) | | — |
| 1 | GENERAL | | — |
| 1.1 | SCOPE | | — |
| 3 | GENERAL REQUIREMENT AND GENERAL TEST REQUIREMENTS | | — |
| 4 | MARKING | | P |
| 5 | INTERCHANGEABILITY | | P |
| 5.1 and 5.2 | For Edison screw lamp holder, is checked by measurement and by inserting the lamp cap into a lamp holder complying with AS 3140 | | P |
| | For Bayonet cap lamp holder, is checked by measurement and by inserting the lamp cap into a lamp holder complying with AS 3117 | | P |
| 6 | PROTECTION AGAINST ELECTRIC SHOCK | | P |
| | Edison screw caps compliance with gauge IEC 60061-3, sheet 7006-51A for E27 caps or by measurement | | P |
| | and sheet 7006-55 for E14 caps or by measurement | | N/A |
| 7 | INSULATION RESISTANCE AND ELECTRIC STRENGTH AFTER HUMIDITY TREATMENT | | P |
| 8 | MECHANICAL STRENGTH | | P |
| | Other appropriate holders can be used except in the case of uncemented caps | | N/A |
| 9 | CAP TEMPERATURE RISE | | P |
| 10 | RESISTANCE TO HEAT | | P |
| 11 | RESISTANCE TO FLAME AND IGNITION | | P |
| | Base material of any printed circuit boards together with any coating or encapsulation is subject to the needle-flame test in accordance with AS/NZS 4695.2.2 | | P |
| | Not carried out on base material that is made of material classified as FV-0 according to AS/NZS 4695.707 | | N/A |
| 12 | FAULT CONDITIONS | | N/A |

Sample Photo



Outlook – 50-45GEU



Outlook – 50-45GEU

Sample Photo



Outlook – 50-45EEU



Outlook – 50-45EEU

Sample photo



Outlook – 50-45BEU

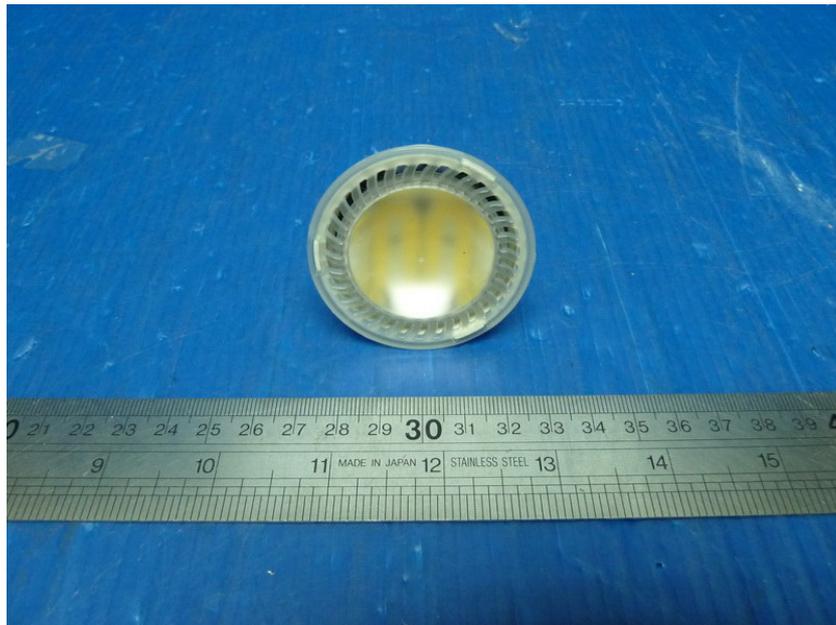


Outlook – 50-45BEU

Sample Photo



LED – 5500 K



LED – 4200 K

Sample photo

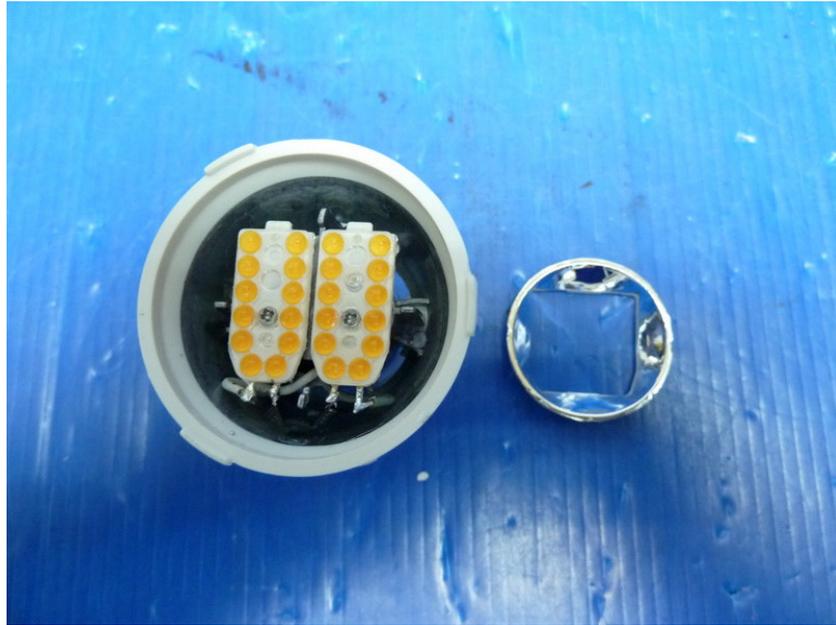


LED – 2900 K

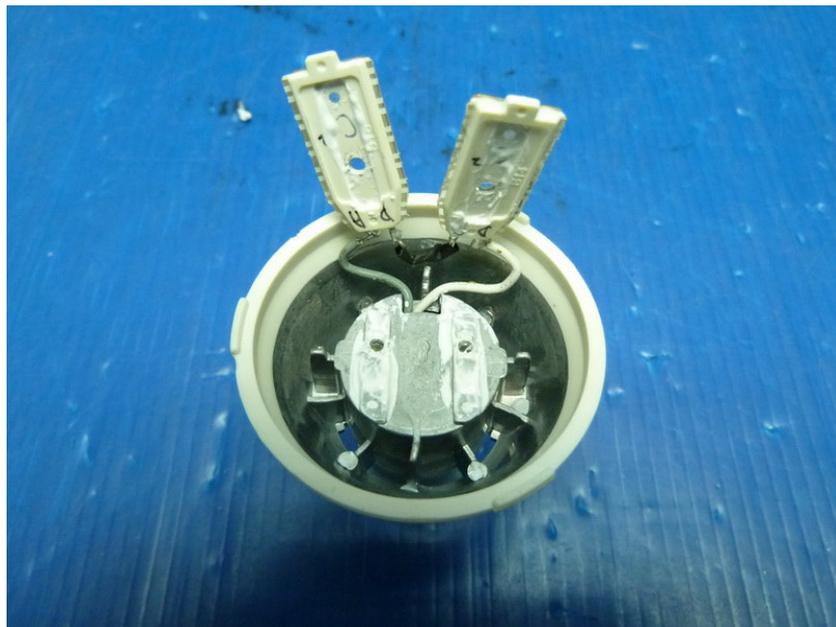


Construction

Sample Photo

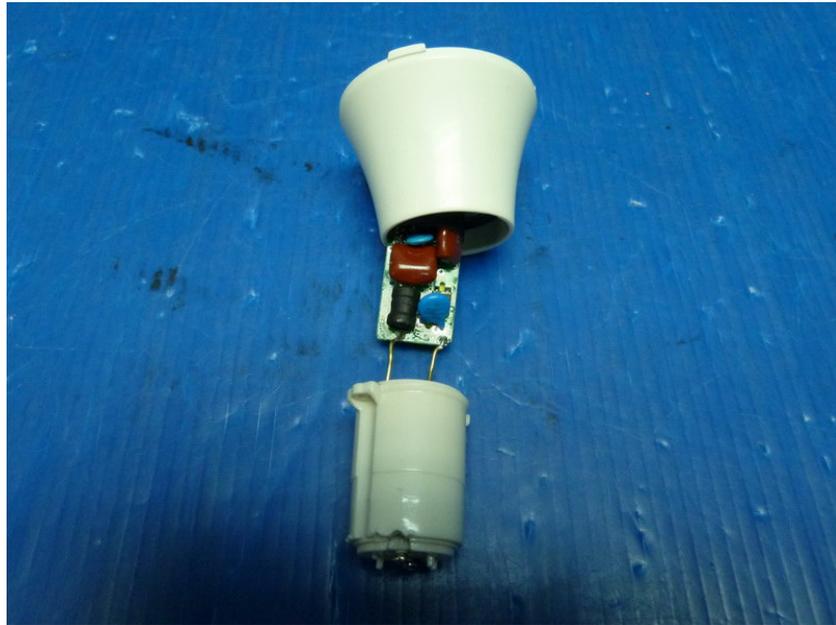


Construction

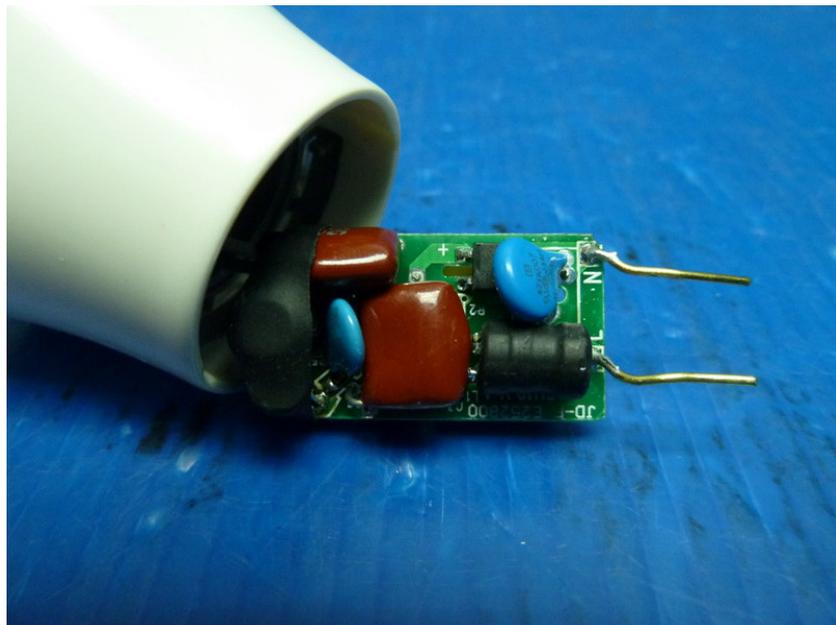


Construction

Sample Photo

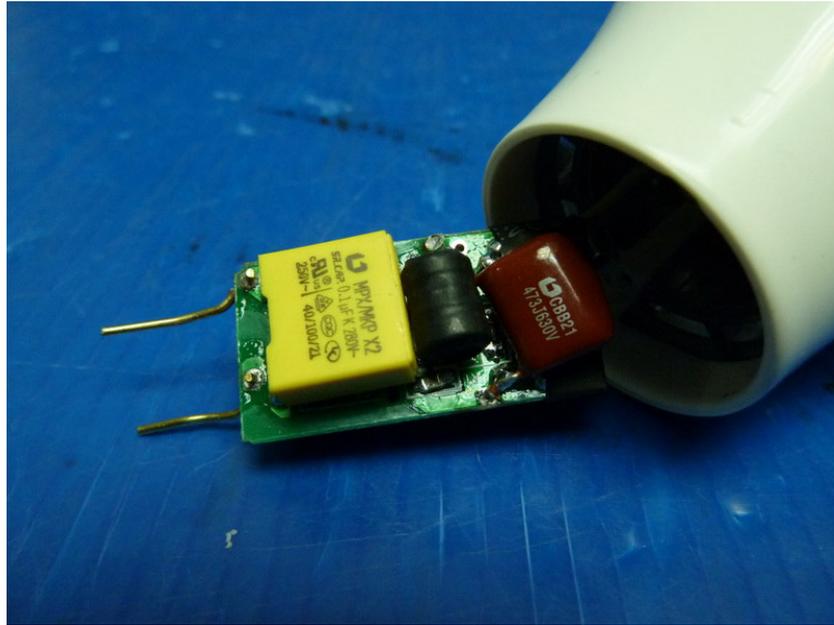


Construction



PCB

Sample Photo



PCB