| | |
|---|---|
| Product Name: | **LED Ceiling Light** |
| Trademark: | **Geosheen** |
| Model Number: | **GT3150BW-W70J2736, RRRRRR.XX-YYYY.AA.DD**<br>**(RRRRRR=GT3100、GT3150、GT3060、GT4060、GT4200、GT5150, XX=BW、BB、BJ、AW, YYYY= W25L、W35L、W50L、W75L、W100L、W30J、W35J、W50J、W70J、W75J, AA=27(2700K)、30(3000K)、40(4000K)、50(5000K), DD= )**<br>**RRRRRR means the model of lamps, XX means the product appearance and color, YYYY means the wattage of each model, AA means the color temperature, DD means the beam angel of each model.** |
| Prepared For :<br>Address: | **SHENZHEN GEOSHEEN LIGHTING CO.,LTD.**<br>Floor 1-6，Block D, Hepinggang Technology Industrial Zone, Fengmen Road, Gangtou, Bantian, Shenzhen, P.R.C |
| Prepared By :<br>Address: | **Shenzhen BCTC Technology Co., Ltd.**<br>A.Floor 3, 44 Building, Tanglang Industrial Park B, Taoyuan Street, Nanshan District, Shenzhen, China |
| Test Date: | **Sep. 09 - Sep. 16, 2014** |
| Date of Report : | **Sep. 16, 2014** |
| Report No.: | **BCTC-** |

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# TEST REPORT DECLARATION

| | | |
|---|---|---|
| Applicant | : | **SHENZHEN GEOSHEEN LIGHTING CO.,LTD.** |
| Address | : | Floor 1-6，Block D, Hepinggang Technology Industrial Zone, Fengmen Road, Gangtou, Bantian, Shenzhen, P.R.C |
| Manufacturer | : | **SHENZHEN GEOSHEEN LIGHTING CO.,LTD.** |
| Address | : | Floor 1-6，Block D, Hepinggang Technology Industrial Zone, Fengmen Road, Gangtou, Bantian, Shenzhen, P.R.C |
| EUT Description | : | **LED Ceiling Light** |
| Model Number | : | **GT3150BW-W70J2736** |
| Rating(s) | : | **AC100-240V~ 50/60Hz 43W** |

Test Procedure Used:

EMI : EN 55015: 2013
EN 61000-3-2 :2006+A1:2009+A2:2009, EN 61000-3-3: 2013

EMS : EN 61547: 2009
EN 61000-4-2 :2009, EN 61000-4-3 :2006+A1:2008+A2:2010,
EN 61000-4-4 :2012, EN 61000-4-5 :2006,
EN 61000-4-6: 2014, EN 61000-4-8 :2010, EN 61000-4-11 :2004

The EUT described above is tested by BCTC Technology Co., Ltd. EMC Laboratory to determine the maximum emissions from the EUT and ensure the EUT to be compliance with the immunity requirements of the EUT. Shenzhen BCTC Technology Co., Ltd. is assumed full responsibility for the accuracy of the test results. Also, this report shows that the EUT technically complies with the 2004/108/EC directive and its amendment requirements.
The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

Date of Test: **Sep. 09 - Sep. 16, 2014**

Prepared by(Engineer):

Reviewer(Quality Manager):

Approved & Authorized Signer(Manager):

# 1. GENERAL INFORMATION

## 1.1. Report information

1.1.1. This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that BCTC approves mends or endorses the manufacture, supplier or use of such product/equipment, or that BCTC in any way guarantees the later performance of the product/equipment.

1.1.2. The sample/s mentioned in this report is/are supplied by Applicant, BCTC therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.

1.1.3. Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through BCTC, unless the applicant has authorized BCTC in writing to do so.

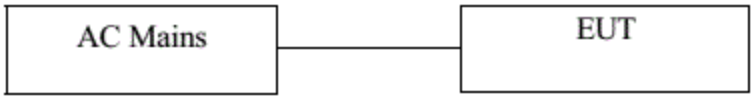
## 1.2. Measurement Uncertainty

Available upon request.

# 2. PRODUCT DESCRIPTION

## 2.1. EUT Description

| | | |
|---|---|---|
| Description | : | **LED Ceiling Light** |
| Applicant | : | **SHENZHEN GEOSHEEN LIGHTING CO.,LTD.**<br>Floor 1-6，Block D, Hepinggang Technology Industrial Zone, Fengmen Road, Gangtou, Bantian, Shenzhen, P.R.C |
| Manufacturer | : | **SHENZHEN GEOSHEEN LIGHTING CO.,LTD.**<br>Floor 1-6，Block D, Hepinggang Technology Industrial Zone, Fengmen Road, Gangtou, Bantian, Shenzhen, P.R.C |
| Model Number | : | **GT3150BW-W70J2736** |



## 2.5. Abbreviations

| | |
|---|---|
| AC | Alternating Current |
| AMN | Artificial Mains Network |
| DC | Direct Current |
| EM | ElectroMagnetic |
| EMC | ElectroMagnetic Compatibility |
| EUT | Equipment Under Test |
| IF | Intermediate Frequency |
| RF | Radio Frequency |
| rms | root mean square |
| EMI | Electromagnetic Interference |
| EMS | Electromagnetic Susceptibility |

## 2.6. Performance Criterion

**Criterion A:** The equipment shall continue to operate as intended without operator intervention. No degradation of performance of loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended.

**Criterion B:** After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the equipment is used as intended.

**Criterion C:** Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.

# 3. TEST EQUIPMENT USED

## 3.1. For Conducted Emission Test

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1 | Test Receiver | Rohde & Schwarz | ESHS30 | 828985/018 | Oct. 30, 13 | 1 Year |
| 2 | Pulse Limiter | Rohde & Schwarz | ESH3-Z2 | 100006 | Oct. 30, 13 | 1 Year |
| 3 | L.I.S.N. | Rohde & Schwarz | ESH2-Z5 | 834549/005 | Oct. 30, 13 | 1 Year |
| 4 | Conical | Emtek | N/A | N/A | N/A | N/A |
| 5 | Voltage Probe | Schwarzbeck | TK9416 | N/A | Oct. 30, 13 | 1 Year |
| 6 | Coaxial Switch | Anritsu | MP59B | | Oct. 30, 13 | 1 Year |

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1 | Test Receiver | Rohde & Schwarz | ESHS30 | 828985/018 | Oct. 30, 13 | 1 Year |
| 2 | Triple-loop Antenna | Rohde & Schwarz | HM020 | 843885/002 | Oct. 30, 13 | 1 Year |
| 3 | RF Cable | MIYAZAKI | 5D-2W | Tri-loop Cable | Oct. 30, 13 | 1 Year |
| 4 | Coaxial Switch | Anritsu | MP59B | M73989 | Oct. 30, 13 | 1 Year |

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1 | Power Frequency test system | HAEFELY | PHF555 | 080419-03 | Oct. 30, 13 | 1 Year |

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1 | ESD Tester | HAEFELY | PSD 1600 | H911'292 | Oct. 30, 13 | 1 Year |

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1 | Signal Generator | HP | 8648A | 3633A02081 | Oct. 30, 13 | 1 Year |
| 2 | Amplifier | A&R | 500A100 | 17034 | N/A | N/A |
| 3 | Amplifier | A&R | 100W/1000M1 | 17028 | N/A | N/A |
| 4 | Isotropic Field Monitor | A&R | FM2000 | 16829 | N/A | N/A |
| 5 | Isotropic Field Probe | A&R | FLW220100 | 16755 | Oct. 30, 13 | 1 Year |
| 6 | Biconic Antenna | EMCO | 3108 | 9507-2534 | N/A | N/A |
| 7 | Log-periodic Antenna | A&R | AT1080 | 16812 | N/A | N/A |
| 8 | PC | N/A | 486DX2 | N/A | N/A | N/A |

## 3.6. For Electrical Fast Transient/Burst Immunity Test

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1 | Burst Tester | HAEFELY | PEFT4010 | 080981-16 | Oct. 30, 13 | 1 Year |
| 2 | Coupling Clamp | HAEFELY | IP-4A | 147147 | Oct. 30, 13 | 1 Year |

## 3.7. For Surge Test

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1 | Surge Tester | HAEFELY | PSURGE4.1 | 080107-04 | Oct. 30, 13 | 1 Year |

## 3.8. For Injected Currents Susceptibility Test

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1 | Simulator | EMTEST | CWS 500C | 0900-12 | Oct. 30, 13 | 1 Year |
| 2 | CDN | EMTEST | CDN-M2 | 10 | Oct. 30, 13 | 1 Year |
| 3 | VDN | EMTEST | CDN-M3 | 0900-11 | Oct. 30, 13 | 1 Year |
| 4 | Injection Clamp | EMTEST | F-2031-23MM | 368 | Oct. 30, 13 | 1 Year |
| 5 | Attenuator | EMTEST | ATT6 | a | Oct. 30, 13 | 1 Year |

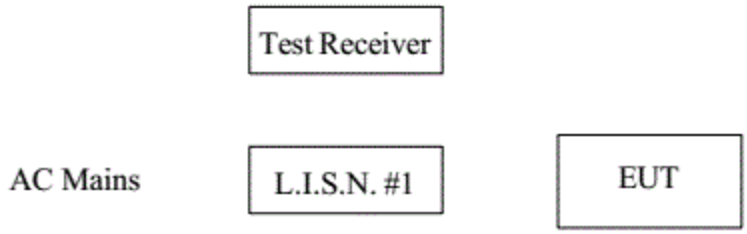
| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1 | Magnetic Field Tester | HEAFELY | MAG100.1 | 083858-10 | Oct. 30, 13 | 1 Year |

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1 | Dips Tester | HEAFELY | PLINE 1610 | 083732-18 | Oct. 30, 13 | 1 Year |

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1. | Spectrum Analyzer | ANRITSU | MS2661C | | Oct. 30, 13 | 1 Year |
| 2. | Test Receiver | Rohde & Schwarz | ESHS30 | 828985/018 | Oct. 30, 13 | 1 Year |
| 3. | Bilog Antenna | Schwarzbeck | VULB9163 | 142 | Oct. 30, 13 | 1 Year |
| 4. | 50 Coaxial Switch | Anritsu Corp | MP59B | | Oct. 30, 13 | 1 Year |
| 5. | EMI Power Line Filter | DUOJI EME | FNF 201 B16 | N/A | Oct. 30, 13 | 1 Year |
| 6. | EMI Power Line Filter | JIANLI | DL-40C | N/A | Oct. 30, 13 | 1 Year |
| 7. | Cable | Schwarzbeck | AK9513 | ACRX1 | Oct. 30, 13 | 1 Year |
| 8. | Cable | Rosenberger | N/A | FP2RX2 | Oct. 30, 13 | 1 Year |
| 9. | Cable | Schwarzbeck | AK9513 | CRPX1 | Oct. 30, 13 | 1 Year |
| 10. | Cable | Schwarzbeck | AK9513 | CRRX2 | Oct. 30, 13 | 1 Year |
| 11. | Signal Generator | HP | 8648A | 3625U00573 | Oct. 30, 13 | 1 Year |

# 4. POWER LINE CONDUCTED EMISSION TEST

## 4.1. Block Diagram of Test Setup




## 4.2. Test Standard

EN 55015: 2013

## 4.3. Power Line Conducted Emission Limit

| Frequency | At mains terminals (dBmV) | |
|---|---|---|
| | Quasi-peak Level | Average Level |
| 9KHz ~ 50KHz | 110 | N/A |
| 50KHz ~ 150KHz | 90 ~ 80* | N/A |
| 150KHz ~ 0.5MHz | 66 ~ 56* | 56 ~ 46* |
| 0.5MHz ~ 5.0MHz | 56 | 46 |
| 5 MHz ~ 30MHz | 60 | 50 |

Notes: 1. At the transition frequency the lower limit applies.
2. * decreasing linearly with logarithm of the frequency.

## 4.4. EUT Configuration on Test

The following equipments are installed on conducted emission test to meet EN55015 requirement and operating in a manner, which tends to maximize its emission characteristics in a normal application.

### 4.4.1. **LED Ceiling Light** (EUT)

Model Number : **GT3150BW-W70J2736**

Manufacturer : **SHENZHEN GEOSHEEN LIGHTING CO.,LTD.**

## 4.5. Operating Condition of EUT

4.5.1. Setup the EUT and simulators as shown in Section 4.1.

4.5.2. Turn on the power of all equipments.

4.5.3. Let the EUT work in test modes (EUT WORKING) and test it.

## 4.6. Test Procedure

The EUT is put on the table which is 0.8 meter high above the ground and connected to the AC mains through a Line Impedance Stabilization Network (L.I.S.N.). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are checked to find out the maximum conducted emission according to the **EN55015** regulations during conducted emission test. And the voltage probe had been used for the load terminals test according to the **EN55015** standard.

The bandwidth of the test receiver (R&S Test Receiver ESHS30) is set at 10KHz. In 150KHz~30MHz and 200Hz bandwidth in 9KHz~150KHz.

The frequency range from 9KHz to 30MHz is checked.

## 4.7. Test Result

PASS

Please refer to the following page.

**Line**

Neutral

# 5. MAGNETIC TEST

## 5.1. Block Diagram of Test Setup

| Frequency | Limits for loop diameter (DbmA) |
|---|---|
| | 2m |
| 9KHz ~ 70KHz | 88 |
| 70KHz ~ 150KHz | 88 ~ 58* |
| 150KHz ~ 3.0MHz | 58 ~ 22* |
| 3.0MHz ~ 30MHz | 22 |

## 5.6. Test Procedure

The EUT is placed on a wood table in the center of a loop antenna. The induced current in the loop antenna is measured by means of a current probe and the test receiver. Three field components is checked by means of a coax switch.

The frequency range from 9KHz to 30MHz is investigated. The receiver is measured with the quasi-peak detector. For frequency band 9KHz to 150KHz, the bandwidth of the field strength meter (R&S Test Receiver ESHS30) is set at 200Hz. For frequency band 150KHz to 30MHz , the bandwidth is set at 10KHz.

All the test results are listed in Section 5.7.

## 5.7. Test Results

PASS

The frequency range from 9KHz to 30MHz is investigated.
As the peak value is too low against the limit, so the Quasi-peak value has been omitted.
Please refer to the following page.

**X**

**Y**

**Z**

# 6. HARMONIC CURRENT EMISSION TEST

## 6.1. Block Diagram of Test Setup

AC Mains

AC Mains

0.8
METER

(EUT: LED Ceiling Light )

## 6.2. Test Standard

EN 61000-3-2:2006+A1:2009+A2:2009

## 6.3. Operating Condition of EUT

6.3.1. Setup the EUT as shown in Section 6.1.

6.3.2. Turn on the power of all equipments.

6.3.3. Let the EUT work in test mode (ON) and test it.

## 6.4. Test Procedure

The power cord of the EUT is connected to the output of the test system. Turn on the power of the EUT and use the test system to test the harmonic current level.

## 6.5. Test Results

PASS

# 7. VOLTAGE FLUCTUATIONS & FLICKER TEST

## 7.1. Block Diagram of Test Setup

Same as Section 6.1..

## 7.2. Test Standard

EN 61000-3-3: 2013

## 7.3. Operating Condition of EUT

Same as Section 6.3.. The power cord of the EUT is connected to the output of the test system. Turn on the power of the EUT and use the test system to test the harmonic current level.

Flicker Test Limit

| Test items | Limits |
|---|---|
| Pst | 1.0 |
| dc | 3.3% |
| dmax | 4.0% |
| dt | Not exceed 3.3% for 500ms |

## 7.4. Test Results

PASS

# 8. ELECTROSTATIC DISCHARGE TEST

## 8.1. Block Diagram of ESD Test Setup

| Level | Test Voltage<br>Contact Discharge (KV) | Test Voltage<br>Air Discharge (KV) |
|---|---|---|
| 1. | 2 | 2 |
| 2. | 4 | 4 |
| 3. | 6 | 8 |
| 4. | 8 | 15 |
| X. | Special | Special |

## 8.5. Operating Condition of EUT

8.5.1. Setup the EUT as shown in Section 8.1..

8.5.2. Turn on the power of all equipments.

8.5.3. Let the EUT work in test mode (Working Mode) and test it.

## 8.6. Test Procedure

### 8.6.1. Air Discharge:

This test is done on a non-conductive surfaces. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT.
After each discharge, the discharge electrode shall be removed from the EUT.
The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

### 8.6.2. Contact Discharge:

All the procedure shall be same as Section 8.6.1. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

### 8.6.3. Indirect discharge for horizontal coupling plane

At least 20 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.

### 8.6.4. Indirect discharge for vertical coupling plane

At least 20 single discharge shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

## 8.7. Test Results

PASS

Please refer to the following page.

# Electrostatic Discharge Test Results

## Shenzhen BCTC Technology Co., Ltd.

| | | | |
|---|---|---|---|
| Applicant : | SHENZHEN GEOSHEEN LIGHTING CO.,LTD. | Test Date : | Sep. 16, 2014 |
| EUT : | LED Ceiling Light | Temperature: | 25℃ |
| M/N : | GT3150BW-W70J2736 | Humidity : | 53% |
| Power Supply : | AC230V | | |
| Test Engineer : | Alyssa Jia | | |

Air Discharge: ± 8KV

Contact Discharge: ± 4KV # For each point positive 25 times and negative 25 times discharge

| Test Points | Air Discharge | Contact Discharge | Performance Criterion | Result |
|---|---|---|---|---|
| Others Slot of the EUT | ±2,4,8KV | N/A | A | PASS |
| PLASTIC SHELL | ±2,4,8KV | N/A | A | PASS |
| METAL SHELL | N/A | ±2,4 KV | A | PASS |
| SCREW | N/A | ±2,4 KV | A | PASS |
| VCP | N/A | ±2,4 KV | A | PASS |
| HCP | N/A | ±2,4 KV | A | PASS |

# 9. RF FIELD STRENGTH SUSCEPTIBILITY TEST

## 9.1. R/S Test Setup

| Level | Field Strength V/m |
|---|---|
| 1. | 1 |
| 2. | 3 |
| 3. | 10 |
| X. | Special |

## 9.4. EUT Configuration on Test

The configuration of EUT are listed in Section 3.5..