

ISTMT Test Report

For

LIGHT EFFICIENT DESIGN

188 S. Northwest Highway Cary, IL 60013, USA

Direct Linear Ambient Luminaires

Model Name(s):

RP-LBI-G1-4F-25W-XXK-WC-[Blank, OCN]-[BAA, Blank]

Representative (Tested) Model:

RP-LBI-G1-4F-25W-XXK-WC

Model Difference:

1. WC represents power adjustable and color tunable, wattage can adjust 10W, 15W and 25W, color tunable 2700K, 3000K and 3500K.
2. [Blank, OCN] represent sensor option, OCN represents occupancy sensor and N can be a number 1 to 4 for sensor number, Blank represents without sensor.
3. [BAA, Blank] is for business purpose.
4. All construction is the same, except the function.

Prepare by :

Engineer: Derek Lai

Date: 2019-11-19

Review by:

Technical Lead: Vincent Yuan

Issue Date: 2019-11-

Revised Date: N/A

- Note:
1. The results contained in this report pertain only to the tested samples.
 2. This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd
 3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency of the Federal Government.

Product Information:

| | |
|------------------------|-----------------------------------|
| Client Name: | LIGHT EFFICIENT DESIGN |
| Brand Name: | REMPHOS OR LIGHT EFFICIENT DESIGN |
| Model Number: | RP-LBI-G1-4F-25W-XXK-WC |
| Product Type: | Direct Linear Ambient Luminaires |
| Rating Input: | 100-277Vac, 50/60Hz, 25W |
| Declared CCT: | 2700K/000K/3500K |
| Declared Light Output: | 3100 lm |
| Declared Lifetime: | 50000 hours |
| LED Manufacturer: | Hongli Zihui Group Co., Ltd. |
| LED Model: | HL-AS-PU2835DW-S1-08-PCT-HR3 |
| LED Quantity: | 112 pcs |

Test Information:

| | |
|------------------------------|--------------|
| Date of Receipt Samples: | 2019-11-06 |
| Quantity of Receipt Samples: | 1 pcs |
| Sample Number: | 191106003-S1 |

Laboratory Information:

| | |
|----------------------------|--|
| Test Laboratory: | Dongguan New Testing Centre Co., Ltd |
| Laboratory Address: | 3F, No. 1 the 1 st North Industry Road, Songshan Lake Science & Technology Park, Dongguan, Guangdong, China |
| Laboratory Contact Name: | Neil Zhong |
| Laboratory Contact E-mail: | Neil_ntc@163.com |

Report Information:

| | |
|------------------------------|--|
| Issued Date of Test Report: | 2019-11- |
| Revised Date of Test Report: | N/A |
| Test Report No.: | NTCLR19110107 |
| Remark (If applicable): | 1. All tests with the default maximum wattage, the default maximum wattage is 25W. |

| Test Specification: | |
|----------------------------|---|
| Date of Test | 2019-11-08 |
| Test Item | 1. In-Situ Temperature Measured Test (ISTMT) |
| Reference Standard | ANSI/UL 1598-2018 Luminaire IES LM-84-14 IES Approved Method for Measuring Luminous Flux and Color Maintenance of LED Lamps, Light Engines, and Luminaires |

| Test Methods: |
|---|
| <p>1. In-Situ Temperature Measurement Test (ISTMT)</p> <p>According to UL 1598 and IES LM-84-14, Annex A, maximum LED source operated temperature measurements were taken on one test sample per model with a thermocouple and temperature meter. The SSL sample could reach thermal equilibrium for at least 3 hours before measurements were taken. LED source temperature was measured at the point as indicated by the included diagram in accordance with manufacturers declared hot spot location. The maximum temperature was recorded for the sample. A simulated ceiling or other enclosure may be used in accordance to UL 1598 as applicable.</p> |

DRY

In-Situ Temperature Measurement Test Results:

Electrical Data:

| Voltage (V) | Frequency (Hz) | Current (A) | Wattage (W) | Power Factor | Orientation | Test Time (hours) |
|-------------|----------------|-------------|-------------|--------------|-------------|-------------------|
| 120.0 | 60 | 0.2094 | 25.03 | 0.9960 | Face Down | 3.5 |

Test Result:

| TC Location | Measured LED Driver Current (mA) | Temperature (°C) | | | Limits (°C) | TM-21 Result |
|--------------------|----------------------------------|------------------|-------------|-------------------|-------------|------------------|
| | | Ambient | Test Result | Corrected to 25°C | | Reported (hours) |
| TMP _{LED} | 148.2 | 26.1 | 61.7 | 60.6 | 85 | L70 >54000 |

Test Result from TM-21:

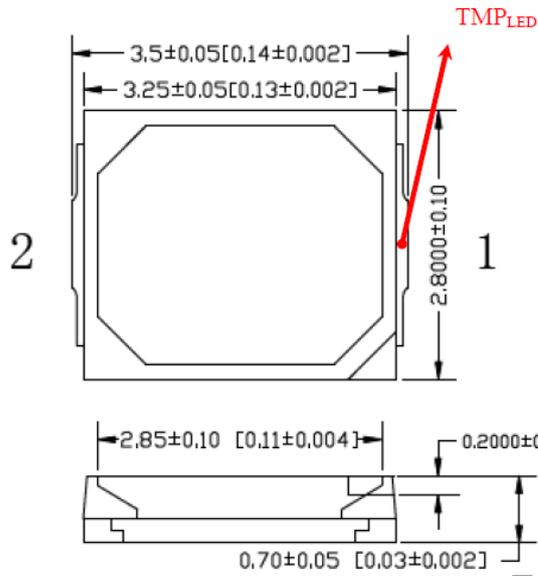
***In-Situ* Inputs**

| | |
|---|-------|
| Drive current for each LED package/array/module (mA): | 148.2 |
| <i>In-situ</i> case temperature (T _c , °C): | 60.6 |
| Percentage of initial lumens to project to (e.g. for L ₇₀ , enter 70): | 70 |

Results

| | |
|--|--------|
| Time (t) at which to estimate lumen maintenance (hours): | 50,000 |
| Lumen maintenance at time (t) (%): | 90.25% |
| Reported L70 (hours): | >54000 |

TMP Position in LM-80:



Thermocouple Position on TMP:

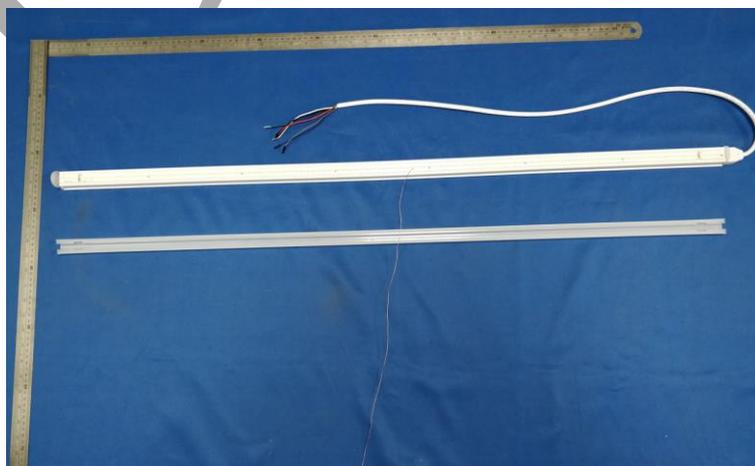
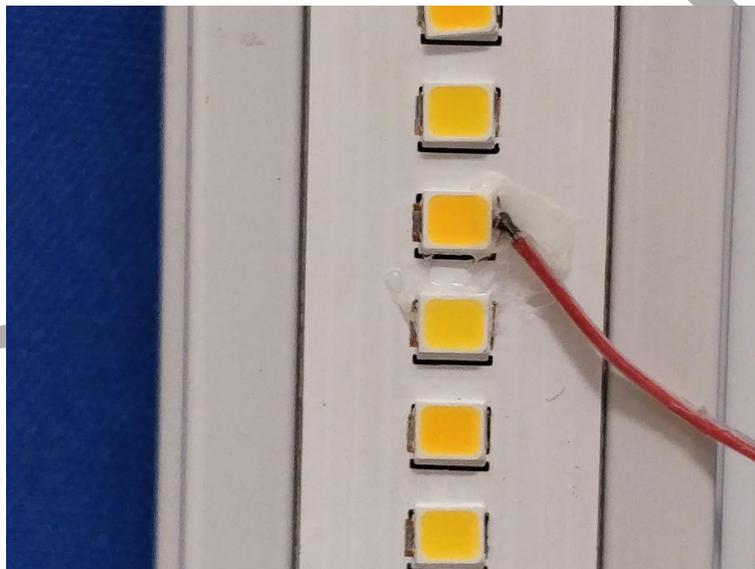
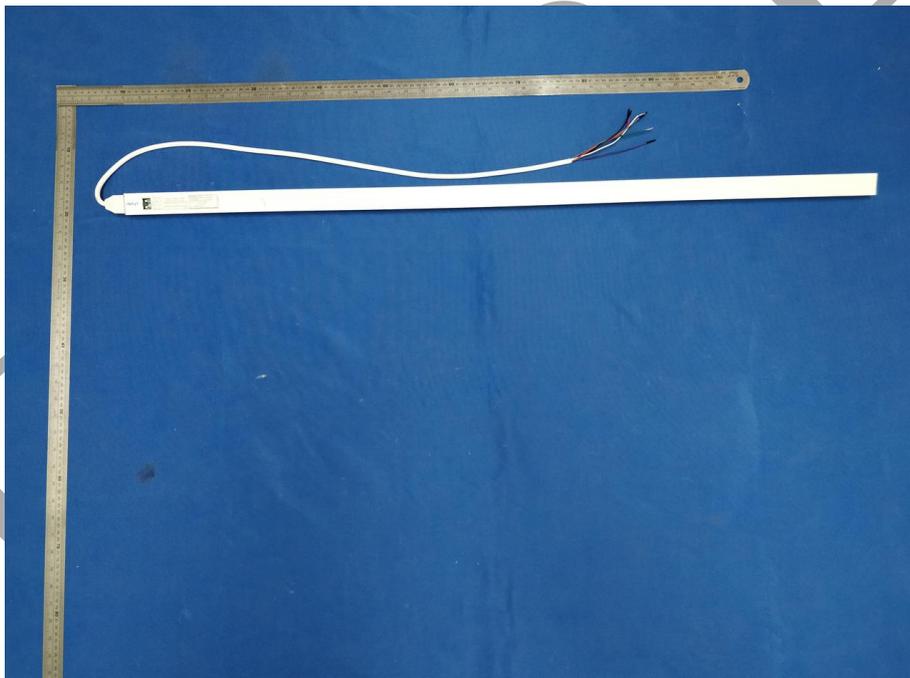


Photo of Sample:



Equipment List:

| Equipment ID | Equipment Name | Last Cal. | Due Cal. |
|--------------|------------------------------|------------|------------|
| NTC-F01-031 | Digital Power Meter | 2019-08-22 | 2020-08-21 |
| NTC-F01-019 | Temperature & Humidity Meter | 2018-11-12 | 2019-11-11 |
| NTCD-S001 | Temperature Data Logger | 2018-11-12 | 2019-11-11 |

*****End of Report*****

Draft