

REPORT

25800 COMMERCENTRE DRIVE, LAKE FOREST, CA 92630

Project No. G103924656

Date: May 7, 2019

REPORT NO. 103924656LAX-009

TEST OF ONE LED LUMINAIRE

MODEL NO. ALD-R-060W-LV-30K-T4
LED MODEL NO. GWP9LR34.PM-M2M3
DRIVER MODEL NO. EUD-075S180DT
RETROFIT MODEL NO. LITHONIA KAD CONTOUR SERIES

RENDERED TO

SIMPLYLEDS LLC
111 W. 34TH STREET
GARDEN CITY, IDAHO, 83714

TEST: Electrical and Photometric tests as required to the IESNA test standard.

AUTHORIZATION: The testing performed was authorized by signed quote number Qu-00973316-2.

STANDARDS USED: The following American National Standards or Illuminating Engineering Society of North America Test Guides were used in part or totally to test each specimen:

IESNA LM-79 - 2008: Electrical and Photometric Measurements of Solid State Lighting

UL 1598-2009: Underwriters Laboratories Inc. Standard for Safety - Luminaires

DESCRIPTION OF SAMPLE: The client submitted one production sample of model number ALD-R-060W-LV-30K-T4. The sample was received by Intertek on March 19, 2019, in undamaged condition and one sample was tested as received. The sample designation was LAN1903191345-003A.

DATES OF TESTS: May 7, 2019.

SUMMARY

| |
|---------------------------------|
| Model No.: ALD-R-060W-LV-30K-T4 |
| Description: LED Luminaire |

| Criteria | Result |
|---|------------|
| Total Lumen Output (Lumens) | 7606 |
| Total Power (W) | 59.121 |
| Luminaire Efficacy (LPW) | 128.7 |
| BUG Rating | B2-U0-G2 |
| IES Classification | Type IV |
| Longitudinal Classification | Very Short |
| Maximum In-Situ Source Temperature Point (°C) | 40.2 |
| Maximum In-Situ Driver Case Temperature (°C) | 51.5 |

EQUIPMENT LIST

| Equipment Used | Model Number | Control Number | Last Date Calibrated | Calibration Due Date | Date Used |
|---------------------|-------------------|----------------|----------------------|----------------------|-----------|
| Goniophotometer | 6440T | 000943 | VBU | VBU | 05/07/19 |
| AC Source | CW1251P | 000944 | VBU | VBU | 05/07/19 |
| Power Analyzer | WT210 | 000945 | 11/28/18 | 11/28/19 | 05/07/19 |
| Magnetic Level | 581-9 | 001610 | 10/31/18 | 10/31/19 | 05/07/19 |
| Thermometer | DPI8-C24 | 001782 | 09/21/18 | 09/21/19 | 05/07/19 |
| AC Source | CW1251P | 001336 | 02/19/2019 | 02/19/2020 | 05/07/19 |
| Power Meter | WT333-D-C1/EX2/G5 | 001322 | 11/28/2018 | 11/28/2019 | 05/07/19 |
| Thermometer | 52II | 001265 | 10/04/2018 | 10/04/2019 | 05/07/19 |
| Temp. & RH Meter | 971 | 001177 | 01/29/2019 | 01/29/2020 | 05/07/19 |
| True RMS Multimeter | 179 | 001099 | 04/03/2019 | 04/03/2020 | 05/07/19 |

TEST METHODS

Seasoning in Sample Orientation – LED Products

No seasoning was performed in accordance with IESNA LM-79.

Photometric and Electrical Measurements – Distribution Method

A LSI Type C High Speed Model 6440 Mirror Goniometer was used to measure the intensity (candelas) at each angle of distribution for each sample.

Ambient temperature was measured equal to the height of the sample mounted on the Goniometer equipment. Each sample was operated at input rated voltage in its designated orientation. Each sample was allowed to stabilize for at least thirty minutes before measurements were made. Electrical measurements including voltage, current, and power were measured using the Xitron or Yokogawa Power Analyzer.

Some graphics were created with Photometrics Plus software.

BUG Ratings (Backlight, Uplight, Glare) – for Outdoor Fixtures Only

Zonal Lumens were calculated and grouped using the formula in IESNA TM-15-11 for each zone as defined in the BUG addendum. The maximum lumen rating in each zone was compared against the BUG zonal requirements of Energy Star. Photometric Toolbox software was used to calculate results.

In-Situ Maximum Measured Power Supply Case and LED Source Point Temperature

Power supply case and/or LED source operating temperature measurements were taken on one test sample per model with a thermocouple and Fluke 87 temperature meter. The SSL sample was allowed to reach thermal equilibrium for seven and a half hours before measurements were taken. Power supply or source temperature measurements were measured at the TMPPS or TS point as indicated by the included diagram in accordance with manufacturers declared hot spot location, or at a hot spot location found with a thermal camera when no diagram from the manufacturer is given. The maximum temperature was recorded for the sample. A simulated ceiling or other enclosure may be used in accordance to UL 1598 or UL 153 as applicable.

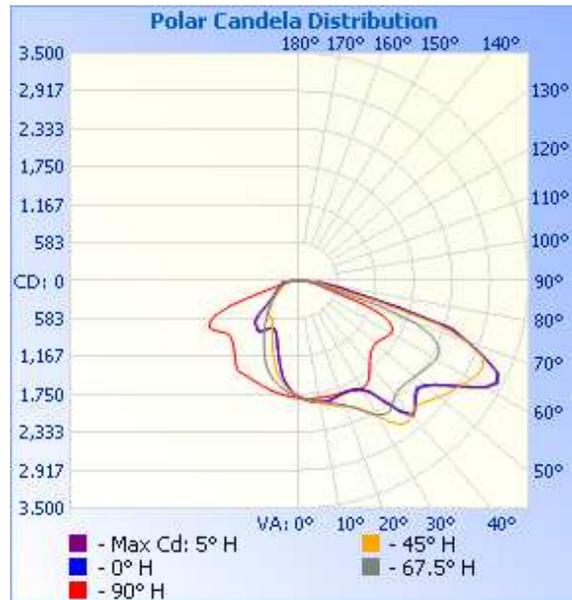
RESULTS OF TEST (cont'd)

Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) – Distribution Method

| Intertek Sample No. | Base Orientation | Input Voltage {Vac} | Input Current (mA) | Input Power (Watts) | Input Power Factor | Current ATHD | Absolute Luminous Flux (Lumens) | Lumen Efficacy (LPW) |
|---------------------|------------------|---------------------|--------------------|---------------------|--------------------|--------------|---------------------------------|----------------------|
| LAN1903191345-003A | UP | 120.0 | 496.0 | 59.12 | 0.994 | 5.70 | 7606 | 128.7 |
| | | 277.0 | 226.7 | 58.49 | 0.932 | 8.20 | | |

Intensity (Candlepower) Summary at 25°C - Candelas

| Angle | 0 | 25 | 45 | 67.5 | 90 |
|-------|------|------|------|------|------|
| 0 | 1804 | 1804 | 1804 | 1804 | 1804 |
| 5 | 1856 | 1862 | 1849 | 1830 | 1817 |
| 10 | 1892 | 1916 | 1910 | 1878 | 1825 |
| 15 | 1888 | 1946 | 1980 | 1946 | 1835 |
| 20 | 1856 | 1953 | 2056 | 2038 | 1841 |
| 25 | 1855 | 1981 | 2167 | 2183 | 1868 |
| 30 | 1926 | 2103 | 2408 | 2377 | 1912 |
| 35 | 2243 | 2514 | 2702 | 2434 | 1855 |
| 40 | 2684 | 2710 | 2665 | 2289 | 1675 |
| 45 | 2496 | 2605 | 2655 | 2263 | 1551 |
| 50 | 2496 | 2761 | 2784 | 2295 | 1515 |
| 55 | 2800 | 2947 | 2900 | 2354 | 1552 |
| 60 | 3268 | 3210 | 3029 | 2412 | 1618 |
| 65 | 3340 | 3274 | 3102 | 2342 | 1532 |
| 70 | 2716 | 2528 | 2730 | 1882 | 1044 |
| 75 | 1568 | 1301 | 1258 | 614 | 386 |
| 80 | 651 | 472 | 444 | 319 | 237 |
| 85 | 330 | 246 | 285 | 208 | 121 |
| 90 | 0 | 0 | 0 | 0 | 0 |



RESULTS OF TEST (cont'd)

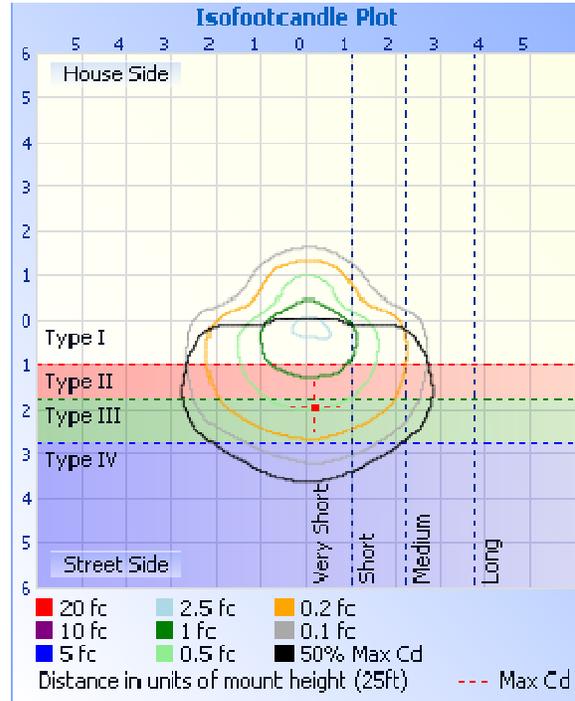
Illumination Plots

Mounting Height: 25 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

| Zone | Lumens | % Luminaire |
|--------|--------|-------------|
| 0-30 | 1362 | 17.9 |
| 0-40 | 2387 | 31.4 |
| 0-60 | 5047 | 66.4 |
| 60-90 | 2559 | 33.6 |
| 0-90 | 7606 | 100.0 |
| 90-180 | 0.0 | 0.0 |
| 0-180 | 7606 | 100.0 |

Luminaire Classification System (LCS)

| LCS | Zone | Lumens | % Luminaire |
|-----|-----------|--------|-------------|
| FL | (0-30) | 821 | 10.8 |
| FM | (30-60) | 2780 | 36.6 |
| FH | (60-80) | 1959 | 25.8 |
| FVH | (80-90) | 128.6 | 1.7 |
| BL | (0-30) | 542.1 | 7.1 |
| BM | (30-60) | 904 | 11.9 |
| BH | (60-80) | 380.0 | 5.0 |
| BVH | (80-90) | 92.2 | 1.2 |
| UL | (90-100) | 0.0 | 0.0 |
| UH | (100-180) | 0.0 | 0.0 |

Zonal Lumens and Percentages at 25°C

| Zone | Lumens | % Luminaire |
|-------|--------|-------------|
| 0-10 | 169.3 | 2.2 |
| 10-20 | 472.5 | 6.2 |
| 20-30 | 720.6 | 9.5 |
| 30-40 | 1025 | 13.5 |
| 40-50 | 1236 | 16.2 |
| 50-60 | 1424 | 18.7 |
| 60-70 | 1563 | 20.5 |
| 70-80 | 775.7 | 10.2 |
| 80-90 | 220.8 | 2.9 |

BUG Rating: B2-U0-G2
IES Classification: Type IV
Longitudinal Classification: Very Short

RESULTS OF TEST (cont'd)

In-Situ Maximum Measured LED Source Temperature

Manufacturer Supplied Documentation:

Forward Voltage Groups ^{1) page 45}
Durchlassspannungsgruppen ^{1) Seite 23}

| Group | (min.) V _F [V] | (max.) V _F [V] |
|--------|---------------------------|---------------------------|
| Gruppe | (min.) V _F [V] | (max.) V _F [V] |
| K8 | 20.80 | 21.60 |
| T8 | 21.60 | 22.40 |
| 28 | 22.40 | 23.20 |

| Parameter | Symbol | Values | Unit |
|---|-----------------------|--------|---------|
| Bezeichnung | Symbol | Werte | Einheit |
| "Electrical" thermal resistance junction / solder point (typ.) | R _{th JS el} | 1.5 | K/W |
| "Elektrischer" Wärmewiderstand Sperrschicht / Lötpad (with efficiency η _e = 59 %) | | | |

Maximum Ratings
Grenzwerte

| Parameter | Symbol | Values | Unit |
|--|----------------|--------|---------|
| Bezeichnung | Symbol | Werte | Einheit |
| Junction temperature Sperrschichttemperatur | T _j | 125 | °C |

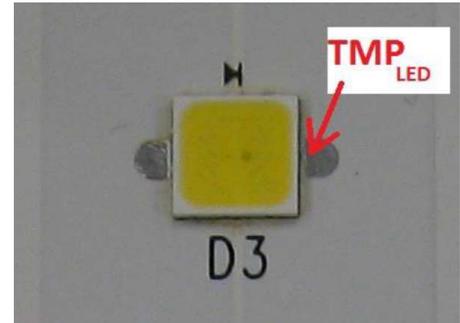


Fig. 2 DURIS S8 type LED model GW P9LT31.PM and temperature measurement point.

Maximum Junction Temperature from LED specification (T_j) = 125°C

Thermal Resistance Formula from LED specification = 1.5°C/W

Maximum Forward Voltage (V_f) from LED specification = 23.2V

Measured LED Current = 383.3mA

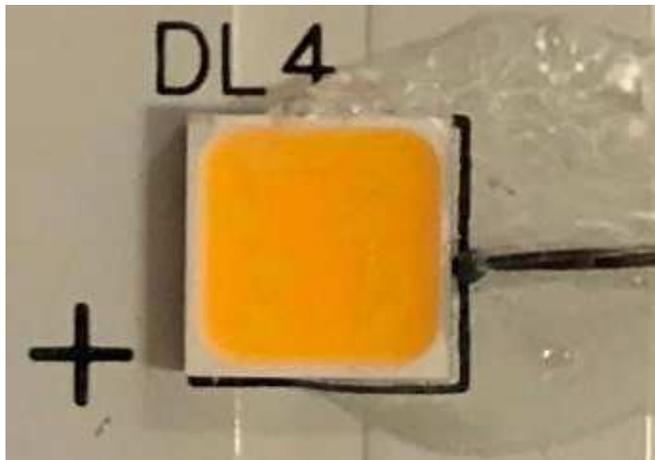
Calculated LED Wattage = V_f x Measured LED Current = 8.893W

Maximum Source Temperature (T_s) = T_j – (LED Wattage x Thermal Resistance) = 111.7°C

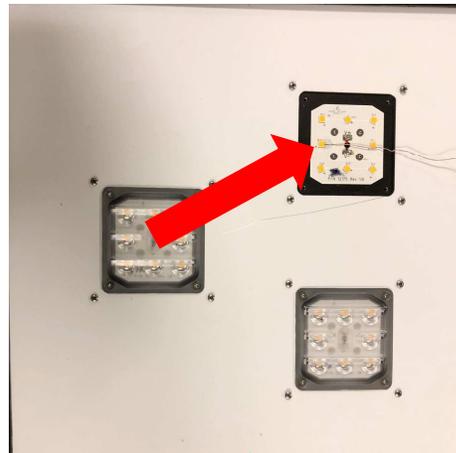
Maximum Measured Manufacturer Designated Source Temperature

| Sample No. | Maximum Measured Source Temperature (°C) | Location | Maximum Rated Source Temperature (°C) |
|--------------------|--|-----------------|---------------------------------------|
| LAN1903191345-003A | 40.2 | Per specs above | 111.7 |

LED In-Situ Picture – T_s



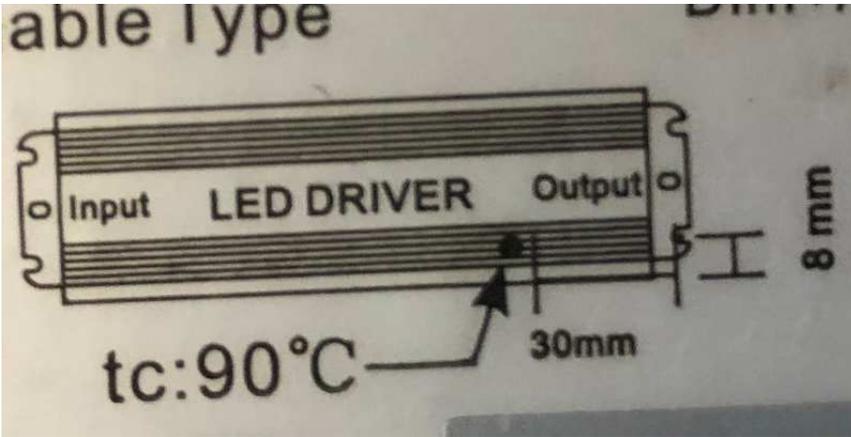
LED In-Situ Picture – T_s location



RESULTS OF TEST (cont'd)

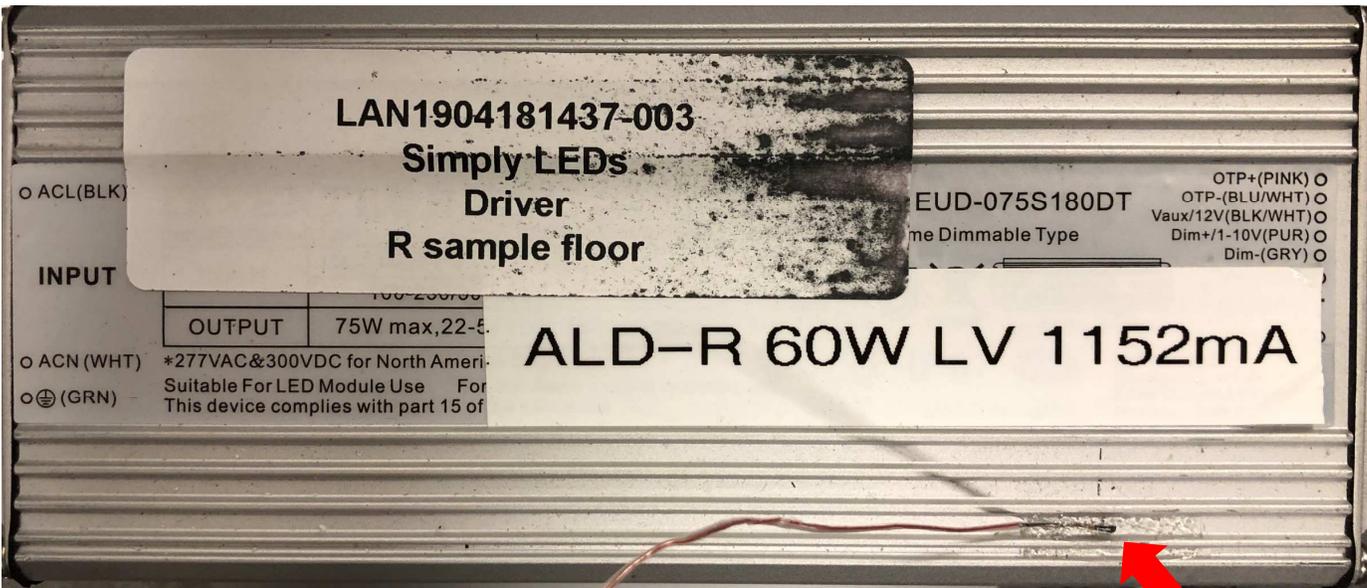
In-Situ Maximum Measured Power Supply Case Temperature

Manufacturer Supplied Documentation:



| Sample No. | Maximum Measured Source Temperature (°C) | Location | Maximum Rated Source Temperature (°C) |
|--------------------|--|-----------------|---------------------------------------|
| LAN1903191345-003A | 51.5 | Per specs above | 90.0 |

Driver In-Situ Picture – Ts Location



PICTURES (not to scale)



CONCLUSION

The results tabulated in this report are representative of the actual test samples submitted for this report only. The data is provided to the client for further evaluation. Compliance to the referenced specification requirements was not determined in this report.

In Charge Of Tests:

Handwritten signature of Erik Linares in black ink.

Erik Linares
Associate Engineer
Lighting Division

Attachment: None

Report Reviewed By:

Handwritten signature of Vladimir Kozak in black ink.

Vladimir Kozak
Engineering Supervisor
Lighting Division