TLM-R08
1.00° Ø Low Voltage LED Module for OEM Lighting Fixture Products

FEATURES
- LED alternative to MR8, MR11 and T3 bi-pin halogen lamps
- Light output equal to 20W halogen
- Distribution: 12°, 21°, 41° or 360° pathway lighting lens
- 12V AC/DC input in one flexible unit
- Patented LEDSENSE® Thermal Management simplifies integration and ensures reliability and lumen maintenance
- Efficacy: up to 52 lm/W delivered
- CCT: 2700K, 3000K or 4000K
- CRI: >80 at all CCTs
- Lumen Maintenance: L70 >60,000 hours
- Compatible w/ magnetic transformers & low load electronic transformers

SPECIFICATION

APPLICATION
Fully-integrated, self-contained LED light module with microprocessor-based control system adapts to most tiny fixtures, including sealed outdoor fixtures, with minimal design effort and the lowest possible LED system cost. Key features include LEDSENSE® closed-loop thermal control that maximizes light output while assuring long-term lumen maintenance. Integrated Dynamic Transformer Recognition™, or DTR™, simplifies design efforts and installation, and allows the use of standard cost-effective magnetic or electronic halogen transformers and phase-dimmers.

LED
Provided with high efficiency Cree LED chips. Color variation no greater than 3-step MacAdam Ellipses.

DRIVER
Provided with integral LED driver with microprocessor-based control system designed and manufactured by Sielo. Driver includes LEDSENSE® thermal fold-back, allowing maximum light output in any environment while assuring long-term reliability. Advanced electronics continuously monitor temperatures to ensure LED power does not exceed limits tested by the LED manufacturer to yield no less than 70% of initial light output at more than 60,000 hours of operation.

ENVIRONMENTAL
Functions normally within an operating temperature range of -40° C. to 55° C. (-40° F. to 131° F.) at 0 to 95% relative humidity.

PERFORMANCE
Provides color quality =/>80 CRI and maintains 70% lumen output at more than 60,000 hours per IES TM-21-11, based on the LED manufacturer’s measurement per IES LM-80-08 @ 10,000 hours. To be extended as additional data becomes available.

REGULATORY COMPLIANCE
LED module includes the following regulatory and compliance approvals:
- UL 8750 Recognized Component — damp locations; CSA Standard C22.2 No. 250.0-08;
- FCC Part 15, Unintentional Radiators Class A;
- RoHS.

QUALITY & RELIABILITY
Designed and manufactured within an ISO 9001:2008 certified Quality Management System. Product design validated by Reliability Prediction analysis, based on Telcordia SR-332 Ed. 3. Demonstrated Mean Time Between Failure (MTBF) >3.4 Million hours with a 90% confidence level, which equates to an annual failure rate (AFR) of <0.25%.

WARRANTY
# PERFORMANCE

<table>
<thead>
<tr>
<th>TLM-R08</th>
<th>2700K</th>
<th>3000K</th>
<th>4000K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color Temperature (CCT)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CRI Minimum [typical]</td>
<td>80 [83]</td>
<td>80 [81]</td>
<td>80 [82]</td>
</tr>
<tr>
<td>Power @ 12V AC (watts)</td>
<td>4.8</td>
<td>4.8</td>
<td>4.8</td>
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<tr>
<td>Light Output (lumens)</td>
<td>235</td>
<td>240</td>
<td>250</td>
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<tr>
<td>Efficacy (lm/W)</td>
<td>49</td>
<td>50</td>
<td>52</td>
</tr>
<tr>
<td>Beam Angle</td>
<td>12°</td>
<td>21°</td>
<td>41°</td>
</tr>
<tr>
<td>Average CBCP (cd)</td>
<td>2665</td>
<td>1210</td>
<td>675</td>
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</tbody>
</table>

NOTES

Tested by third party per IESNA-LM79-08.

All specifications subject to tolerance of ±10%.

Typical performance @ 25° C. heatsink temperature, Tc. See Relative Light Output vs. Temperature (left) for the effect of LEDSENSE® thermal fold-back on light output at various operating temperatures.

**LEDSENSE® OPERATION, THERMAL DE-RATING, & LUMEN MAINTENANCE**

The TLM-R08 employs Sielo patented LEDSENSE® Thermal Management Technology to automatically provide maximum light output in various fixtures and operating conditions while assuring long-term lumen maintenance. LEDSENSE® regularly measures the operating temperature and ensures compliance with a pre-programmed temperature and drive-current profile. This profile is based on the LED manufacturer's LM-80 data report and minimum L70 >60,000-hour lumen maintenance curves. LEDSENSE® is always active, and will compensate for variation in thermal conditions due to heatsinking, ambient air, light engine positioning, or any other variable that affects the operating temperature. The thermal de-rating curve below identifies the relative light output that can be expected under various thermal conditions. The LEDSENSE® power curve identifies the reduction in input power over temperature.

## PHOTOMETRY

### Relative Candela Distribution (3000K)

### Illuminance at a Distance (3000K)

![Power vs. Heatsink Temperature](image)

![Light Output vs Temperature](image)
OPTIONAL 360° OPTIC
Ideal for pathway fixtures and mini bollards. Snaps onto the module, over any primary lens type. Part number TLMA-332000803.