Near-Infrared (NIR) Light-Emitting Diode

Lms16LED series

<table>
<thead>
<tr>
<th>Device parameters</th>
<th>Symbol</th>
<th>Value</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating/ storage temperature</td>
<td>$T_{stg}$</td>
<td>-60..+90*</td>
<td>°C</td>
</tr>
<tr>
<td>Soldering temperature (can be applied for not more than 5 secs)</td>
<td>$T_{sul}$</td>
<td>+180</td>
<td>°C</td>
</tr>
</tbody>
</table>

*Temperature range may vary for different packaging types.

All parameters refer to LEDs in TO18 package with a cavity and operation at ambient temperature 25°C unless otherwise stated.

<table>
<thead>
<tr>
<th>LED parameters</th>
<th>Conditions</th>
<th>Symbol</th>
<th>Value</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak emission wavelength</td>
<td>qCW mode ¹ I = 25 mA</td>
<td>$\lambda_p$</td>
<td>1.60 - 1.69</td>
<td>µm</td>
</tr>
<tr>
<td>FWHM of the emission band</td>
<td>qCW mode ² I = 25 mA</td>
<td>FWHM</td>
<td>120 - 150</td>
<td>nm</td>
</tr>
<tr>
<td>Average optical power (minimal / typical)¹</td>
<td>qCW mode ³ I = 200 mA</td>
<td>$P_{qCW}$</td>
<td>min 7 / typ 9</td>
<td>mW</td>
</tr>
<tr>
<td>Peak optical power (minimal / typical)²</td>
<td>Pulse mode ⁴ I = 1 A</td>
<td>$P_{pul}$</td>
<td>min 20 / typ 24</td>
<td>mW</td>
</tr>
<tr>
<td>Maximum operating current</td>
<td>qCW mode ²</td>
<td>$I_{qCW}$</td>
<td>200</td>
<td>mA</td>
</tr>
<tr>
<td></td>
<td>Pulse mode ⁴</td>
<td>$I_{pul}$</td>
<td>1</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>DC mode ⁵</td>
<td>$I_{DC}$</td>
<td>100</td>
<td>mA</td>
</tr>
<tr>
<td>Forward voltage</td>
<td>qCW mode ³ I = 200 mA</td>
<td>V</td>
<td>0.7 - 1.1</td>
<td>V</td>
</tr>
</tbody>
</table>

Typical spectrum (qCW³, 25 mA)

Spectra at different temperatures (qCW³, 25 mA)

Typical optical power characteristic (qCW³)

Typical current-voltage characteristic (qCW³)

¹ Parameter tested for each device.
² Parameter tested for representative sampling.
³ qCW mode: repetition rate: 0.5 KHz, pulse duration: 1 ms, duty cycle: 50%.
⁴ Pulse mode: repetition rate: 0.5 KHz, pulse duration: 20 µs, duty cycle: 1%.
⁵ DC mode: direct current.

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<table>
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<tr>
<th>Packages</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>TO-18 with a cap with a glass window</td>
<td>Lms16LED</td>
</tr>
<tr>
<td>TO-18 with a parabolic reflector without a glass window</td>
<td>Lms16LED-R</td>
</tr>
<tr>
<td>TO-18 with a parabolic reflector with a glass window</td>
<td>Lms16LED-RW</td>
</tr>
<tr>
<td>TO-5 with a built-in thermocooler and thermoresistor, covered by a cap with a glass window</td>
<td>Lms16LED-TEM</td>
</tr>
<tr>
<td>TO-5 with a built-in thermocooler and thermoresistor, covered by a parabolic reflector with a glass window</td>
<td>Lms16LED-TEM-R</td>
</tr>
</tbody>
</table>

Radiant characteristics (far-field pattern)

TO-18 package with a cap

TO-18 package with a parabolic reflector

Related products:

- **Photodiodes Lms24PD, Lms25PD series** - detectors of mid-infrared radiation;
- **LED drivers (D-41i, D-51i, minidrivers mD-1c, mD-1p)** - provide LED power supply in pulse modes.
Near-Infrared (NIR) Light-Emitting Diode

To drive the LED we recommend the following basic circuit connections:

LED basic circuit connection

LED with thermoelectric module basic circuit connection

We recommend using **Quasi Continuous Wave (qCW) mode** with a duty cycle 50% or 25% to obtain maximum average optical power and short **Pulse modes** to obtain maximum peak power.

<table>
<thead>
<tr>
<th>Quasi Continuous Wave (qCW) mode</th>
<th>Pulse mode</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="qCW mode diagram" /></td>
<td><img src="image2" alt="Pulse mode diagram" /></td>
</tr>
</tbody>
</table>

**IMPORTANT CAUTIONS:**

- please check your connection circuit before turning on the LED;
- please mind the LED polarity: anode is marked with a RED dot; REVERSE voltage applying is FORBIDDEN;
- please do not connect the LED to the multimeter;
- please control the CURRENT applied to the LED in order NOT to EXCEED the maximum allowable values.
Near-Infrared (NIR) Light-Emitting Diode

Technical Drawings

Lms16LED-R

1.60 - 1.69 μm

1 - LED anode
2 - LED cathode

TOP VIEW

BOTTOM VIEW

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Near-Infrared (NIR) Light-Emitting Diode
1.60 - 1.69 μm

Technical Drawings

Lms16LED-RW

1 - LED anode
2 - LED cathode

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Near-Infrared (NIR) Light-Emitting Diode

1.60 - 1.69 μm

Technical Drawings

Lms16LED-TEM-R

1 - TEC +
2 - LED anode
3 - LED cathode
4 - thermistor
5 - thermistor
6 - TEC -

LED chip on Si substrate

TOP VIEW

BOTTOM VIEW