Near-Infrared (NIR) Light-Emitting Diode

Lms14LED 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</td>
<td>$\lambda$</td>
<td>1.40 - 1.49</td>
<td>μm</td>
</tr>
<tr>
<td>FWHM of the emission band</td>
<td>qCW mode</td>
<td>FWHM</td>
<td>90 - 120</td>
<td>nm</td>
</tr>
<tr>
<td>Average optical power (minimal / typical)</td>
<td>qCW mode</td>
<td>$P_{qCW}$</td>
<td>min 7 / typ 9</td>
<td>mW</td>
</tr>
<tr>
<td>Peak optical power (minimal / typical)</td>
<td>Pulse mode</td>
<td>$P_{pul}$</td>
<td>min 20 / typ 24</td>
<td>mW</td>
</tr>
<tr>
<td>Maximum operating current</td>
<td>qCW mode</td>
<td>$I_{qCW}$</td>
<td>200</td>
<td>mA</td>
</tr>
<tr>
<td></td>
<td>Pulse mode</td>
<td>$I_{pul}$</td>
<td>1</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>DC mode</td>
<td>$I_{DC}$</td>
<td>100</td>
<td>mA</td>
</tr>
<tr>
<td>Forward voltage</td>
<td>qCW mode</td>
<td>$V$</td>
<td>0.8 - 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>Lms14LED</td>
</tr>
<tr>
<td>TO-18 with a parabolic reflector without a glass window</td>
<td>Lms14LED-R</td>
</tr>
<tr>
<td>TO-18 with a parabolic reflector with a glass window</td>
<td>Lms14LED-RW</td>
</tr>
<tr>
<td>TO-5 with a built-in thermocooler and thermoresistor, covered by a cap with a glass window</td>
<td>Lms14LED-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>Lms14LED-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.
To drive the LED we recommend the following basic circuit connections:

**LED basic circuit connection**

![LED basic circuit connection diagram]

**LED with thermoelectric module basic circuit connection**

![LED with thermoelectric module basic circuit connection diagram]

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="qCW.png" alt="qCW mode diagram" /></td>
<td><img src="Pulse.png" 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

Lms14LED

1.40 - 1.49 μm

1 - LED anode
2 - LED cathode

TOP VIEW

BOTTOM VIEW

Rev.011216   The design and specification of the product can be changed by LED Microsensor NT LLC. without notice

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Near-Infrared (NIR) Light-Emitting Diode

1.40 - 1.49 μm

Technical Drawings

Lms14LED-R

1 - LED anode
2 - LED cathode

TOP VIEW

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Lms14LED-TEM-R

Technical Drawings

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

TOP VIEW

BOTTOM VIEW