Near-Infrared (NIR) Light-Emitting Diode

Lms15LED series

### Device parameters

<table>
<thead>
<tr>
<th>Parameter tested for each device.</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>$T_{sol}$</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.

### LED parameters

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Symbol</th>
<th>Value</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak emission wavelength</td>
<td>$\lambda_{p}$</td>
<td>1.50 - 1.59</td>
<td>μm</td>
</tr>
<tr>
<td>FWHM of the emission band</td>
<td>$\text{FWHM}$</td>
<td>110 - 140</td>
<td>nm</td>
</tr>
<tr>
<td>Average optical power (minimal / typical)</td>
<td>$P_{p,\text{qCW}}$</td>
<td>min 7 / typ 10</td>
<td>mW</td>
</tr>
<tr>
<td>Peak optical power (minimal / typical)</td>
<td>$P_{p,\text{qCW}}$</td>
<td>min 20 / typ 26</td>
<td>mW</td>
</tr>
<tr>
<td>Maximum operating current</td>
<td>$I_{\text{qCW}}$</td>
<td>200</td>
<td>mA</td>
</tr>
<tr>
<td>Pulse mode</td>
<td>$I_{pul}$</td>
<td>1</td>
<td>A</td>
</tr>
<tr>
<td>DC mode</td>
<td>$I_{DC}$</td>
<td>100</td>
<td>mA</td>
</tr>
<tr>
<td>Forward voltage</td>
<td>$V$</td>
<td>0.8 - 1.1</td>
<td>V</td>
</tr>
</tbody>
</table>

### Typical spectrum (qCW, 25 mA)

![Typical spectrum](image1)

### Spectra at different temperatures (qCW, 25 mA)

![Spectra at different temperatures](image2)

### Typical optical power characteristic (qCW)

![Typical optical power characteristic](image3)

### Typical current-voltage characteristic (qCW)

![Typical current-voltage characteristic](image4)

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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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## Near-Infrared (NIR) Light-Emitting Diode

### Packages

<table>
<thead>
<tr>
<th>Model</th>
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</tr>
</thead>
<tbody>
<tr>
<td>TO-18 with a cap with a glass window</td>
<td>Lms15LED</td>
</tr>
<tr>
<td>TO-18 with a parabolic reflector without a glass window</td>
<td>Lms15LED-R</td>
</tr>
<tr>
<td>TO-18 with a parabolic reflector with a glass window</td>
<td>Lms15LED-RW</td>
</tr>
<tr>
<td>TO-5 with a built-in thermocooler and thermoresistor, covered by a cap with a glass window</td>
<td>Lms15LED-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>Lms15LED-TEM-R</td>
</tr>
</tbody>
</table>

### Radiant characteristics (far-field pattern)

**TO-18 package with a cap**

<table>
<thead>
<tr>
<th>Relative radiant intensity</th>
<th>0.1</th>
<th>0.2</th>
<th>0.3</th>
<th>0.4</th>
<th>0.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1°</td>
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<td></td>
<td></td>
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<tr>
<td>2°</td>
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<tr>
<td>3°</td>
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<tr>
<td>4°</td>
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<tr>
<td>5°</td>
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<tr>
<td>6°</td>
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<tr>
<td>7°</td>
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<tr>
<td>8°</td>
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<tr>
<td>9°</td>
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</tr>
</tbody>
</table>

**TO-18 package with a parabolic reflector**

<table>
<thead>
<tr>
<th>Relative radiant intensity</th>
<th>0.1</th>
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<th>0.3</th>
<th>0.4</th>
<th>0.5</th>
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### 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.
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To drive the LED we recommend the following basic circuit connections:

**LED basic circuit connection**

![LED basic circuit diagram](image)

**LED with thermoelectric module basic circuit connection**

![LED with thermoelectric module circuit diagram](image)

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.

### Quasi Continuous Wave (qCW) mode

- Drive current:
  - $f = 0.5 - 16 \text{ kHz}$
  - $31 - 1000 \mu s$
  - $31 - 1000 \mu s$

- Time:
  - max. 0.2 A

### Pulse mode

- Drive current:
  - $f = 0.5 - 16 \text{ kHz}$
  - $2 - 20 \mu s$

- Time:
  - $62 - 2000 \mu s$
  - max. 1 A

**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

Lms15LED

1 - LED anode
2 - LED cathode

TOP VIEW
BOTTOM VIEW

HEAD OFFICE LED Microsensor NT, LLC and RnD CENTRE Microsensor Technology, LLC
10, A, Kurchatova str., 1N, St-Petersburg, 194223, Russia; info@lmsnt.com; www.lmsnt.com
Near-Infrared (NIR) Light-Emitting Diode

1.50 - 1.59 μm

Technical Drawings

Lms15LED-R

1 - LED anode
2 - LED cathode

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Technical Drawings

Lms15LED-RW

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1.50 - 1.59 μm

Technical Drawings

Lms15LED-TEM

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

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Lms15LED-TEM-R

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