Near-Infrared (NIR) Light-Emitting Diode

Lms10LED 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</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(^1)</td>
<td>qCW mode(^2) $I = 25$ mA</td>
<td>$\lambda_p$</td>
<td>1.03 - 1.07</td>
<td>μm</td>
</tr>
<tr>
<td>FWHM of the emission band(^1)</td>
<td>qCW mode(^2) $I = 25$ mA</td>
<td>FWHM</td>
<td>30 - 50</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 12 / typ 14</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 30 / typ 33</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(^1)</td>
<td>qCW mode(^3) $I = 200$ mA</td>
<td>$V$</td>
<td>1.1 - 1.4</td>
<td>V</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Typical spectrum (qCW(^3), 25 mA)</th>
<th>Spectra at different temperatures (qCW(^3), 25 mA)</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Spectrum" /></td>
<td><img src="image2.png" alt="Spectra" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Typical optical power characteristic (qCW(^3))</th>
<th>Typical current-voltage characteristic (qCW(^3))</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image3.png" alt="Optical Power" /></td>
<td><img src="image4.png" alt="Current-Voltage" /></td>
</tr>
</tbody>
</table>

\(^1\) 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>Lms10LED</td>
</tr>
<tr>
<td>TO-18 with a parabolic reflector without a glass window</td>
<td>Lms10LED-R</td>
</tr>
<tr>
<td>TO-18 with a parabolic reflector with a glass window</td>
<td>Lms10LED-RW</td>
</tr>
<tr>
<td>TO-5 with a built-in thermocooler and thermoresistor, covered by a cap with a glass window</td>
<td>Lms10LED-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>Lms10LED-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:

- **LED drivers (D-41i, D-51i, minidrivers mD-1c, mD-1p)** - provide LED power supply in pulse modes.

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

**LED basic circuit connection**

1. Pulse generator
2. 1 Ohm resistor
3. LED

**LED with thermoelectric module basic circuit connection**

1. Constant current source
2. I adjust
3. Thermocooler
4. Thermometer
5. LED

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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 kHz
  - 31-1000 μs
  - max. 0.2 A

### Pulse mode

- **Drive current**
  - f = 0.5 - 16 kHz
  - 2-20 μs
  - 62 - 2000 μs
  - max. 1 A

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**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

1.03 - 1.07 μm

Technical Drawings

Lms10LED

1 - LED anode
2 - LED cathode

135±0.5
4.1±0.2
26±0.2
0.3
0.2
2 pins φ0.4

TOP VIEW

BOTTOM VIEW

45°

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Near-Infrared (NIR) Light-Emitting Diode

1.03 - 1.07 μm

Technical Drawings

Lms10LED-RW

1 - LED anode
2 - LED cathode

TOP VIEW

BOTTOM VIEW
Near-Infrared (NIR) Light-Emitting Diode

1.03 - 1.07 μm

Technical Drawings

Lms10LED-TEM

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

TOP VIEW

BOTTOM VIEW

6 pins φ0.45

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Near-Infrared (NIR) Light-Emitting Diode

Technical Drawings

Lms10LED-TEM-R

1.03 - 1.07 μm

TOP VIEW

BOTTOM VIEW

6 pins \( \phi 0.45 \)

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