Near-Infrared (NIR) Light-Emitting Diode

Lms13LED 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>$T_{sol}$</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.

<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>$\lambda_p$</td>
<td>1.25 - 1.33</td>
<td>µm</td>
</tr>
<tr>
<td>FWHM of the emission band</td>
<td>qCW mode</td>
<td>FWHM</td>
<td>70 - 100</td>
<td>nm</td>
</tr>
<tr>
<td>Average optical power (minimal / typical)</td>
<td>qCW mode</td>
<td>$P_{qCW}$</td>
<td>min 10 / typ 12</td>
<td>mW</td>
</tr>
<tr>
<td>Peak optical power (minimal / typical)</td>
<td>Pulse mode</td>
<td>$P_{pul}$</td>
<td>min 25 / typ 29</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>0.9 - 1.2</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.

Rev.011216 The design and specification of the product can be changed by LED Microsensor NT LLC. without notice
Near-Infrared (NIR) Light-Emitting Diode

<table>
<thead>
<tr>
<th>Packages</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>TO-18 with a cap with a glass window</td>
<td>Lms13LED</td>
</tr>
<tr>
<td>TO-18 with a parabolic reflector without a glass window</td>
<td>Lms13LED-R</td>
</tr>
<tr>
<td>TO-18 with a parabolic reflector with a glass window</td>
<td>Lms13LED-RW</td>
</tr>
<tr>
<td>TO-5 with a built-in thermocooler and thermoresistor, covered by a cap</td>
<td>Lms13LED-TEM</td>
</tr>
<tr>
<td>TO-5 with a built-in thermocooler and thermoresistor, covered by</td>
<td>Lms13LED-TEM-R</td>
</tr>
<tr>
<td>a parabolic reflector with a glass window</td>
<td></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 circuit diagram]

LED with thermoelectric module basic circuit connection

![LED with thermoelectric module circuit 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="#" alt="qCW mode diagram" /></td>
<td><img src="#" alt="Pulse mode diagram" /></td>
</tr>
</tbody>
</table>

**Drive current**
- **f = 0.5 - 16 kHz**
- **max. 0.2 A**
- **31-1000 μs**
- **31-1000 μs**

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

**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.

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

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

1.25 - 1.33 μm

Technical Drawings

Lms13LED

1 - LED anode
2 - LED cathode

TOP VIEW

BOTTOM VIEW

LED chip

2 pins Ø0.4

Ø4.8±0.2

Ø3.5±0.2

4.1±0.2

2.6±0.2

13.5±0.5

0.3

0.2

Ø2.5±0.1

Ø5.6±0.2

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

Rev.011216  The design and specification of the product can be changed by LED Microsensor NT LLC. without notice
Near-Infrared (NIR) Light-Emitting Diode

1.25 - 1.33 µm

Technical Drawings

Lms13LED-R

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
Near-Infrared (NIR) Light-Emitting Diode

1.25 - 1.33 μm

Technical Drawings

Lms13LED-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

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