Lms21LED 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$^1$</td>
<td>qCW mode$^3$ I = 150 mA</td>
<td>$\lambda_p$</td>
<td>2.10 - 2.19</td>
<td>μm</td>
</tr>
<tr>
<td>FWHM of the emission band$^1$</td>
<td>qCW mode$^3$ I = 150 mA</td>
<td>FWHM</td>
<td>150 - 250</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 0.8 / typ 1.2</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 7.5 / typ 12</td>
<td>mW</td>
</tr>
<tr>
<td>Maximum operating current</td>
<td>qCW mode$^3$</td>
<td>$I_{qCW}$</td>
<td>250</td>
<td>mA</td>
</tr>
<tr>
<td>Forward voltage$^1$</td>
<td>qCW mode$^3$ I = 200 mA</td>
<td>V</td>
<td>0.5 - 2.5</td>
<td>V</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%.

Typical spectra (qCW$^3$)

Spectra at different temperatures (qCW$^3$, 150 mA)

Typical optical power characteristic (qCW$^3$)

Typical current-voltage characteristic (qCW$^3$)
Near-Infrared (NIR) Light-Emitting Diode

Radiant characteristics (far-field pattern)

<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>Lms21LED</td>
</tr>
<tr>
<td>TO-18 with a parabolic reflector without a glass window</td>
<td>Lms21LED-R</td>
</tr>
<tr>
<td>TO-18 with a parabolic reflector with a glass window</td>
<td>Lms21LED-RW</td>
</tr>
<tr>
<td>TO-5 with a built-in thermocooler and thermoresistor, covered by a cap with a glass window</td>
<td>Lms21LED-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>Lms21LED-TEM-R</td>
</tr>
</tbody>
</table>

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**

- Pulse generator
- 1 Ohm
- LED

**LED with thermoelectric module basic circuit connection**

- Multimeter in resistance mode
- Thermocooler
- Constant current source
- I adjust

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. **Hard CW (continuus wave) mode** is NOT recommended.

**Quasi Continuous Wave (qCW) mode**

- Drive current: f = 0.5 - 16 kHz, 31-1000 μs, max. 0.25 A

**Pulse mode**

- Drive current: f = 0.5 - 16 kHz, 62 - 2000 μs, max. 2 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

Lms21LED-R

1 - LED cathode
2 - LED anode

TOP VIEW

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

1.80 - 1.89 μm

Technical Drawings

Lms21LED-RW

1.80 - 1.89 μm

1 - LED cathode
2 - LED anode

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

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

2.10 - 2.19 μm

Technical Drawings

Lms21LED-TEM

TOP VIEW

BOTTOM VIEW

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

LED chip on Si substrate

6 pins ±0.45
Near-Infrared (NIR) Light-Emitting Diode

Technical Drawings

Lms21LED-TEM-R

TOP VIEW

BOTTOM VIEW

1 - TEC +
2 - LED anode
3 - LED cathode
4 - thermistor
5 - thermistor
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LED chip on Si substrate

6 pins φ0.45

1.80 - 1.89 μm