# Electro Optical Components, Inc.

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LED Microsensor NT

## Mid-Infrared (MIR) Light-Emitting Diode

**3.95 - 4.09 µm**

## Lms41LED series

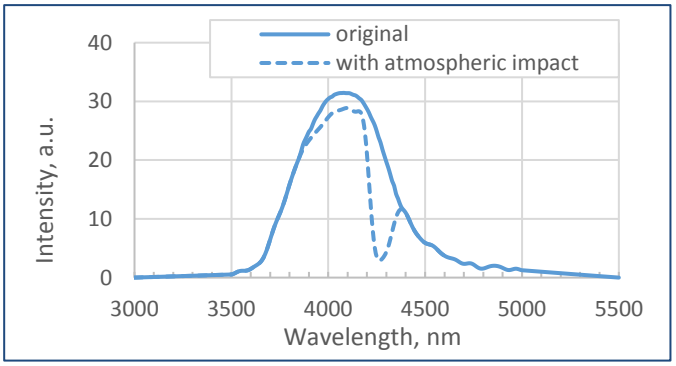
| Device parameters | Symbol | Value | Units |
|---|---|---|---|
| Operating/ storage temperature | $T_{stg}$ | -60..+90* | °C |
| Soldering temperature (can be applied for not more than 5 secs) | $T_{sol}$ | +180 | °C |

*Temperature range may vary for different packaging types.

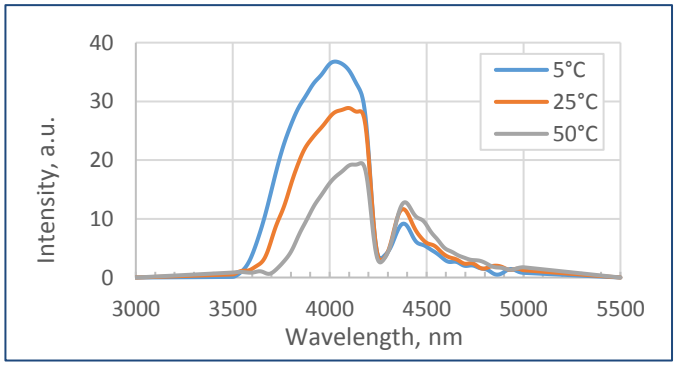
All parameters refer to LEDs in TO18 package with a cavity and operation at ambient temperature 25°C unless otherwise stated.

| LED parameters | Conditions | Symbol | Value | Units |
|---|---|---|---|---|
| Peak emission wavelength[1] | qCW mode[3] I = 150 mA | $\lambda_p$ | 3.95 - 4.09 | µm |
| FWHM of the emission band[1] | qCW mode[3] I = 150 mA | FWHM | 400 - 1200 | nm |
| Average optical power (minimal / typical)[1] | qCW mode[3] I = 200 mA | $P_{qcw}$ | min 12 / typ 20 | µW |
| Peak optical power (minimal / typical)[2] | Pulse mode[4] I = 1 A | $P_{pul}$ | min 100 / typ 150 | µW |
| Maximum operating current | qCW mode[3] | $I_{max\ qcw}$ | 250 | mA |
| | Pulse mode[4] | $I_{max\ pulse}$ | 2 | A |
| Forward voltage[1] | qCW mode[3] I = 200 mA | V | 0.2 - 0.8 | V |

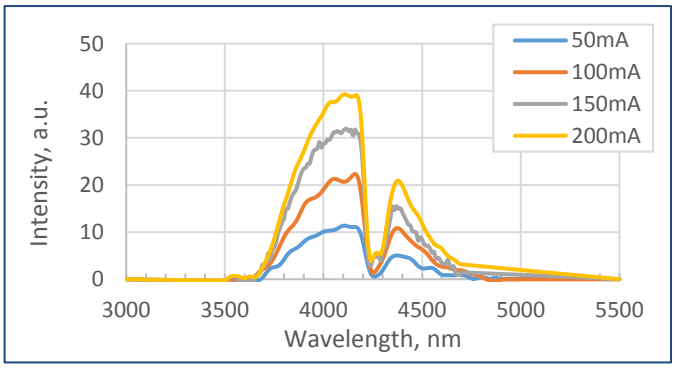
Typical spectrum (qCW[3])



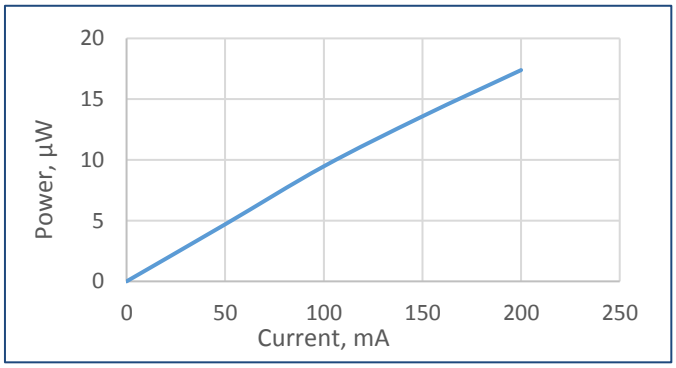

Spectra at different temperatures (qCW[3], 150 mA)




Typical spectra at different currents (qCW[3])




Typical optical power characteristic (qCW[3])



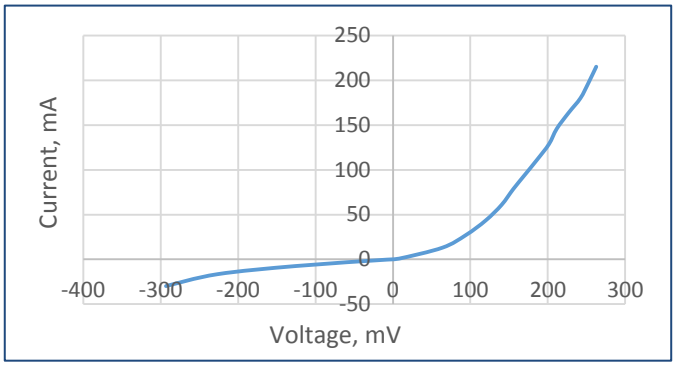

[1] Parameter tested for each device.

[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 current-voltage characteristic (qCW[3])

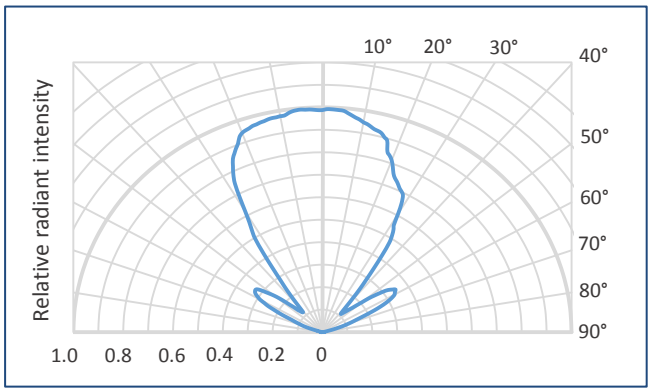



[3] qCW mode: repetition rate: 0.5 KHz, pulse duration: 1 ms, duty cycle: 50%.

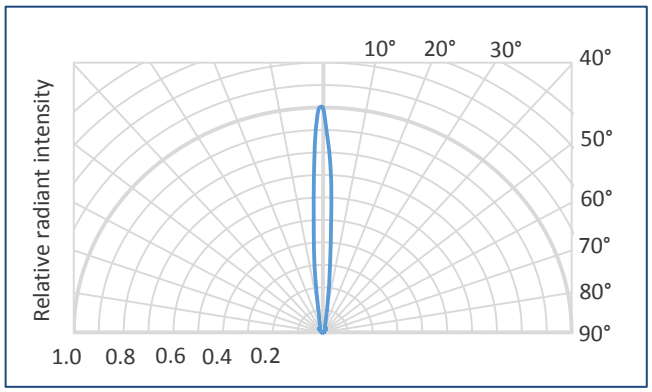
| Packages | Model |
|---|---|
| TO-18 with a cap without a glass window | Lms41LED |
| TO-18 with a parabolic reflector without a glass window | Lms41LED-R |
| TO-18 with a parabolic reflector with a glass window | Lms41LED-RW |
| TO-5 with a built-in thermocooler and thermoresistor, covered by a cap with a glass window | Lms41LED-TEM |
| TO-5 with a built-in thermocooler and thermoresistor, covered by a parabolic reflector with a glass window | Lms41LED-TEM-R |

## Radiant characteristics (far-field pattern)

TO-18 package with a cap




TO-18 package with a parabolic reflector

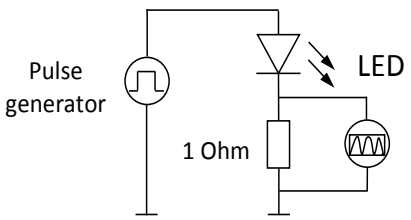



## Related products:

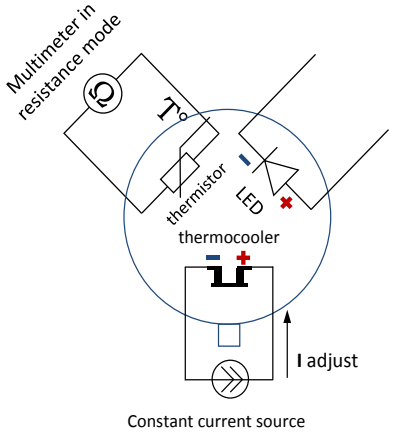
- **Photodiodes Lms43PD series** - detectors of mid-infrared radiation;
- **LED drivers (D-41i, D-51i, minidrivers mD-1c, mD-1p )** - provide LED power supply in pulse modes.

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

**LED basic circuit connection**

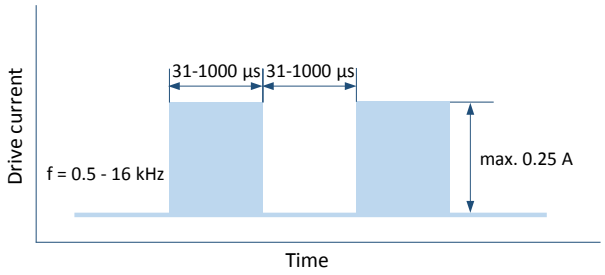



**LED with thermoelectric module basic circuit connection**

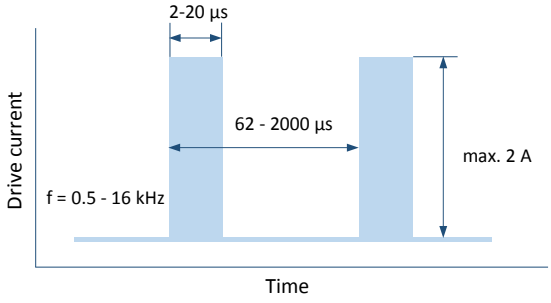



We recommend using **Quasi Continuous Wave (qCW) mode** with a duty cycle 50% or 25% to obtain maximum average optical power and short **Pulse modes** to obtain maximum peak power. Hard CW (continius wave) mode is NOT recommended.

Quasi Continuous Wave (qCW) mode




Pulse mode




**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.