ROITHNER LASERTECHNIK GmbH
WIEDNER HAUPTSTRASSE 76 1040 VIENNA AUSTRIA
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Rev. A1

LED13 series

- Mid-IR LED Series
- 1.25 – 1.33 µm
- 10 – 18 mW QCW

RoHS COMPLIANT Pb-Free

Description

LED13 series contain one LED chip die with a typical peak wavelength of **1.32 µm**, an optical power of typ. **12 mW QCW**. There are different options of packaging available, as you can choose between TO-can, with parabolic reflector (R), window (W), and containing thermoelectric cooler and thermoresistor (T).

Maximum Ratings

Parameter	Symbol	Values Min.	Values Max.	Unit
Operating Current, QCW mode	$I_{QCW\ max}$		200	mA
Operating Current, pulsed mode	$I_{PULSE\ max}$		1	A
Operating Current, CW mode	$I_{CW\ max}$		100	mA
Storage Temperature *	I_{STR}	-60	+90	°C
Operating Temperature *	T_{CASE}	-60	+90	°C
Lead Solder Temperature *²	T_{SLD}		+180	°C

* *Temperature range may vary for different packaging types*
*² *must be completed within 5 seconds*

LED Characteristics (T_{CASE}=25°C)

Parameter	Symbol	Conditions	Values Min.	Values Typ.	Values Max.	Unit
Peak Wavelength	λ_P	I_F=25mA QCW	1.25		1.33	µm
Half Width (FWHM)	$\Delta\lambda$	I_F=25mA QCW	70		100	nm
Optical Output Power, QCW *	P_O	QCW mode *	10	12		mW
Optical Output Power, pulsed *²	P_O	Pulse mode *²	25	29		mW
Operating Voltage	V_{OP}	I_F=200mA QCW	0.9		1.2	V
Switching Time	t_s					ns

* *Repetition rate: 0.5 kHz, pulse duration: 1 ms, duty cycle: 50%, current: 200 mA*
*² *Repetition rate: 0.5 kHz, pulse duration: 20 µs, duty cycle: 1%, current: 1 A*

Packages

Part Number	Package
LED13	TO-18 with cap with glass window
LED13-R	TO-18 with parabolic reflector without glass window
LED13-RW	TO-18 with parabolic reflector with glass window
LED13-TW	TO-5 with built-in thermocooler and thermoresistor, covered by cap with glass window
LED13-TRW	TO-5 with built-in thermocooler and thermoresistor, covered by parabolic reflector with glass window

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

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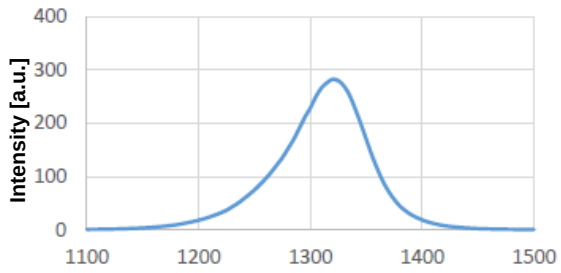
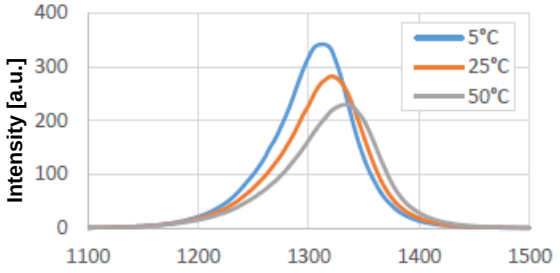
Performance Characteristics

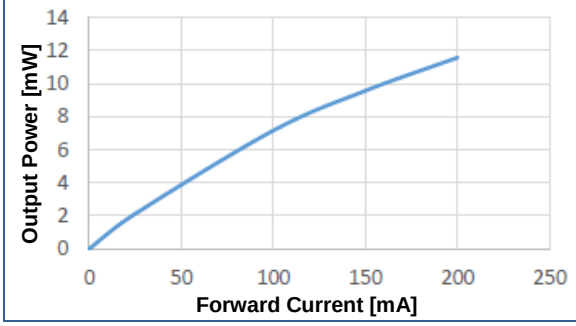
Typ. Spectrum (QCW)



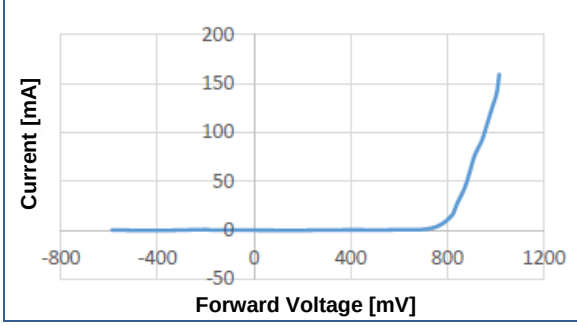
Spectra At Different Temperatures (QCW)



Typ. Optical Power Characteristics (QCW)

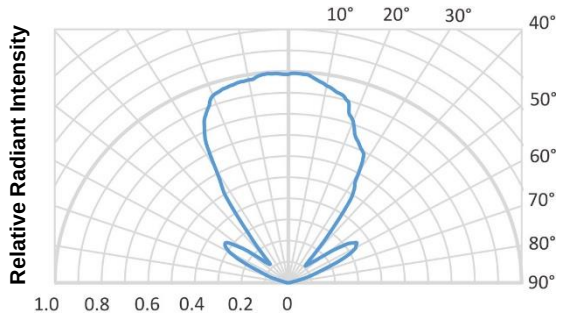


Typ. Current – Voltage Characteristics (QCW)

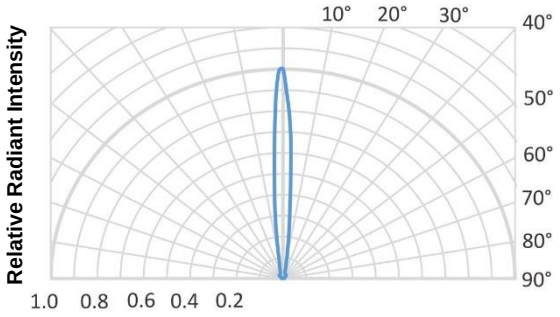


Radiant Characteristics (Far-Field Pattern)

TO-18 Package With Cap



TO-18 package with Parabolic Reflector



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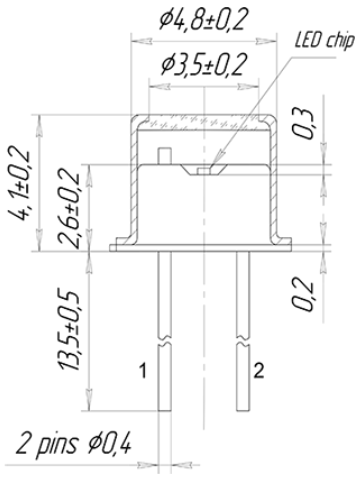
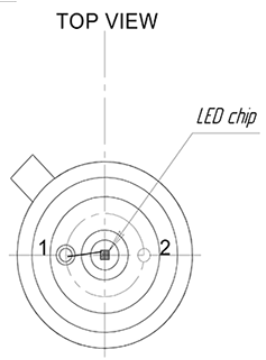
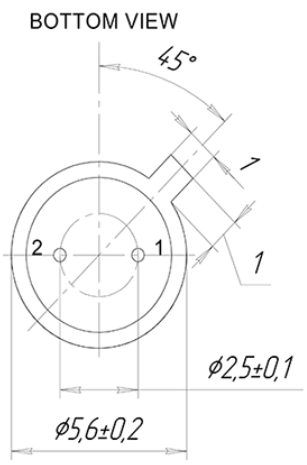
Outline Dimensions

LED13 — TO-18, with cap, with window



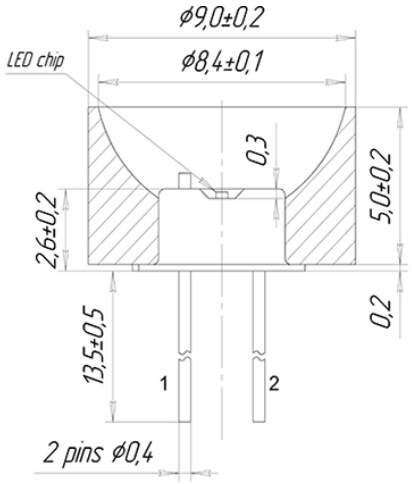


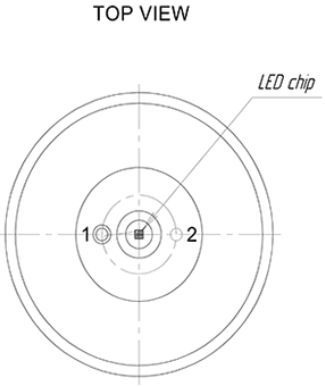


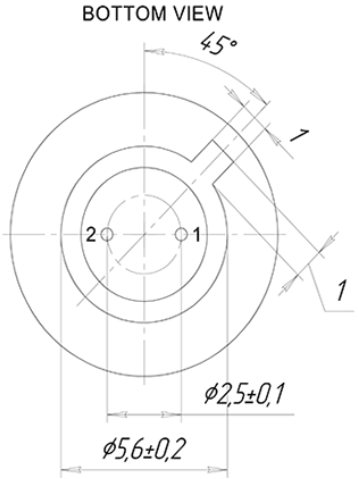
Lead	Description
PIN 1	LED Anode (red dot)
PIN 2	LED Cathode

All Dimensions in mm

LED13-R — TO-18, with parabolic reflector, without window







Lead	Description
PIN 1	LED Anode (red dot)
PIN 2	LED Cathode

All Dimensions in mm

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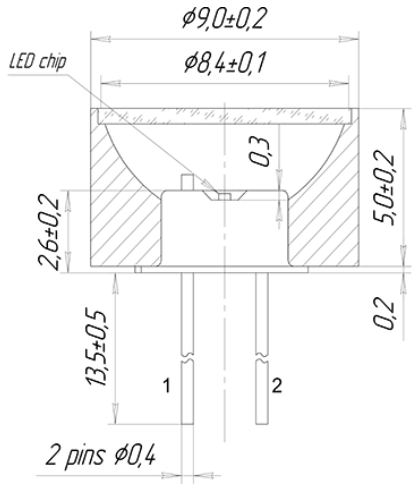
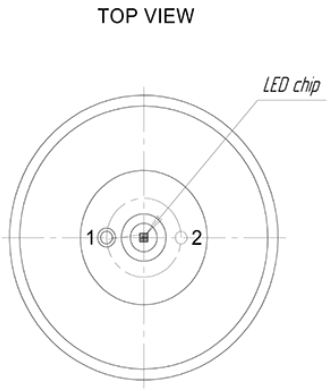
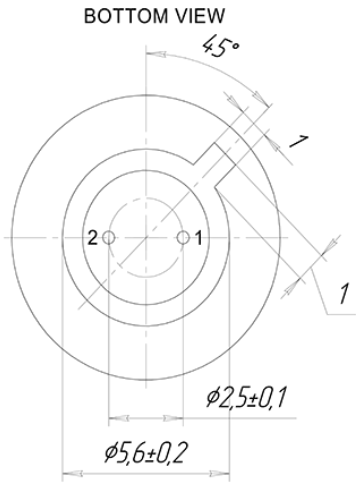
LED13-RW — TO-18, with parabolic reflector and window



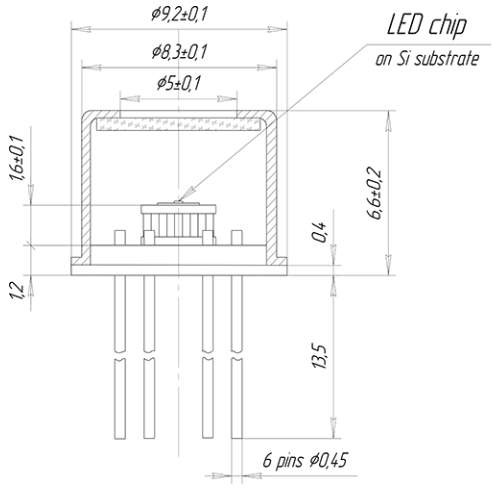


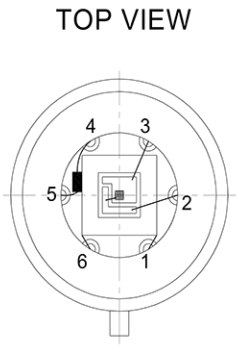


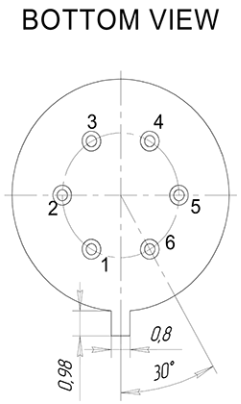
Lead	Description
PIN 1	LED Anode (red dot)
PIN 2	LED Cathode

All Dimensions in mm

LED13-TW — TO-5, thermocooler and thermoresistor, cap and window



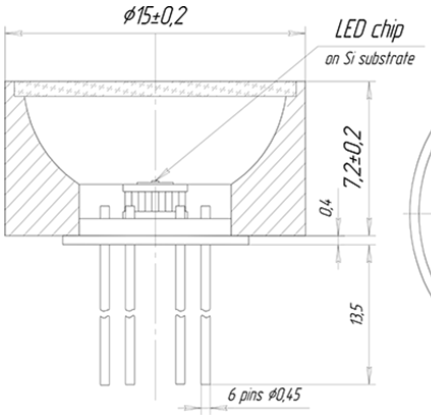


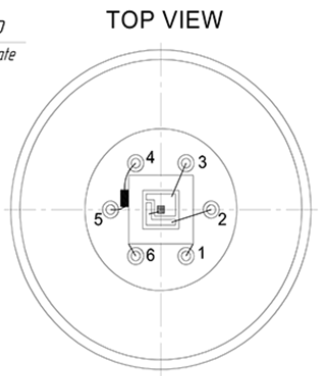


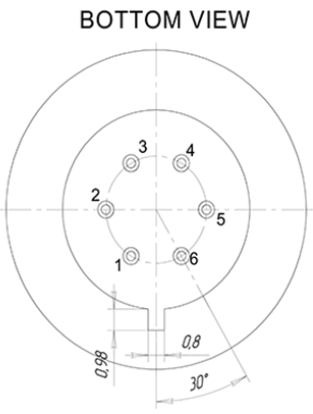
Lead	Description
PIN 1	TEC +
PIN 2	LED Anode (red dot)
PIN 3	LED Cathode
PIN 4	Thermistor
PIN 5	Thermistor
PIN 6	TEC -

All Dimensions in mm

LED13-TRW — TO-5, thermocooler and thermoresistor, cap and window





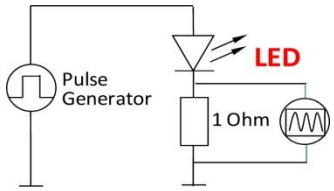


Lead	Description
PIN 1	TEC +
PIN 2	LED Anode (red dot)
PIN 3	LED Cathode
PIN 4	Thermistor
PIN 5	Thermistor
PIN 6	TEC -

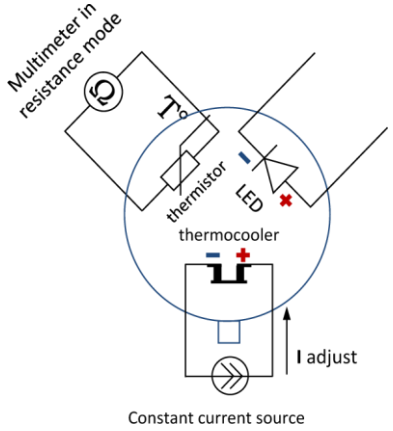
All Dimensions in mm

Operating Regime

LED Basic Circuit Connection

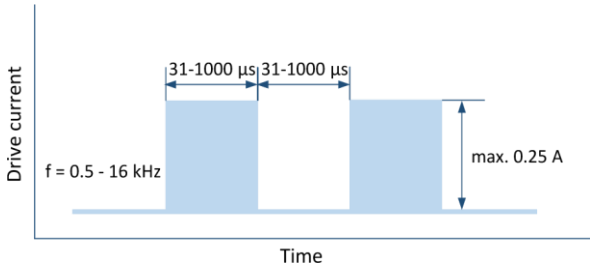


LED With Thermoelectric Module

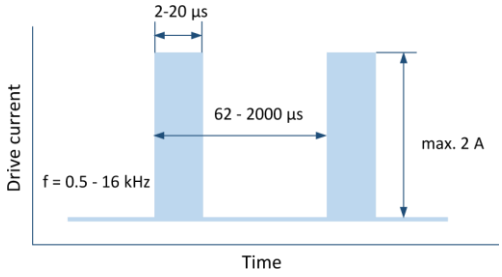


We recommend to use **Quasi Continuous Wave (QCW) mode** with duty cycle 50% or 25% to obtain maximum average optical power and **Pulse mode** to obtain maximum peak power. Hard CW (continuous wave) mode is **NOT** recommended.

Quasi Continuous Wave (QCW) mode



Pulse Mode



Precautions

Cautions:

- Check your connection circuits before turning on the LED.
- Mind the LED polarity: LED anode is marked with a RED dot.
  Reverse voltage applying is FORBIDDEN!
- DO NOT connect the LED to the multimeter.
- Control the current applied to the LED in order not to exceed the maximum allowable values.

Soldering:

- Do avoid overheating of the LED
- Do avoid electrostatic discharge (ESD)
- Do avoid mechanical stress, shock, and vibration
- Do only use non-corrosive flux
- Do not apply current to the LED until it has cooled down to room temperature after soldering

Static Electricity:

LEDs are **sensitive to electrostatic discharge (ESD)**. Precautions against ESD must be taken when handling or operating these LEDs. Surge voltage or electrostatic discharge can result in complete failure of the device.

Operation:

Do only operate LEDs with a current source.
Running these LEDs from a voltage source will result in complete failure of the device.
Current of a LED is an exponential function of the voltage across it. Usage of current regulated drive circuits is mandatory.

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Revisions History

Rev.	Rel. Date	Chapter	Modification	Page
A1	*2020-07-08*	-	Initial release	-
A1	*2021-02-09*		correction	