

**PRELIMINARY**

LED44 series

Rev. 05/2022

- Mid-IR LED Series
- 4.15 – 4.40 μm



Description

LED44 series contain one LED chip die with a peak wavelength of **4.15 – 4.40 μm** , and an optical power of **>10 up to >75 μW QCW**. There are different options of packaging available, as you can choose between TO-can, with parabolic reflector (R), window (W), special glass covering (L), and containing thermoelectric cooler and thermoresistor (T).

Maximum Ratings

Parameter	Symbol	Values		Unit
		Min.	Max.	
Operating Current, QCW mode	$I_{QCW\ max}$		250	mA
Operating Current, pulsed mode	$I_{PULSE\ max}$		2	A
Storage Temperature *	I_{STR}	-60	+90	$^{\circ}\text{C}$
Operating Temperature *	T_{CASE}	-60	+90	$^{\circ}\text{C}$
Lead Solder Temperature *2	T_{SLD}		+260	$^{\circ}\text{C}$

* Temperature range may vary for different packaging types

*2 must be completed within 3 seconds

LED Characteristics

 $(T_{CASE}=25^{\circ}\text{C})$

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Peak Wavelength	λ_P	$I_F=150\text{mA}$ QCW	4.15		4.40	μm
Half Width (FWHM)	$\Delta\lambda$	$I_F=150\text{mA}$ QCW	800		1200	nm
Average Output Power	LED44-R	QCW mode * $I_F=200\text{mA}$ QCW	12			μW
	LED44-RW		12			
	LED44-TRW		10			
	LED44-L		75			
	LED44-LTRW		45			
Optical Output Power, pulsed *2	P_O	Pulse mode *2				μW
Operating Voltage	V_{OP}	$I_F=200\text{mA}$ QCW	0.13		0.50	V
Switching Time	t_s					ns

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

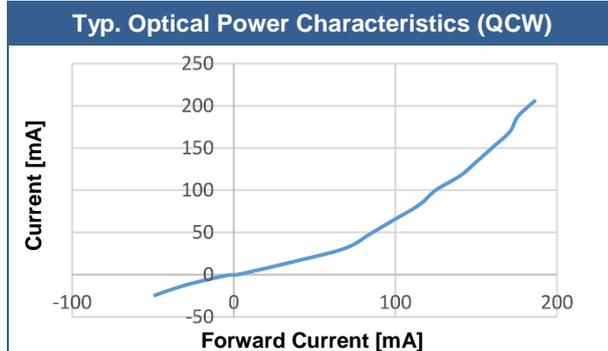
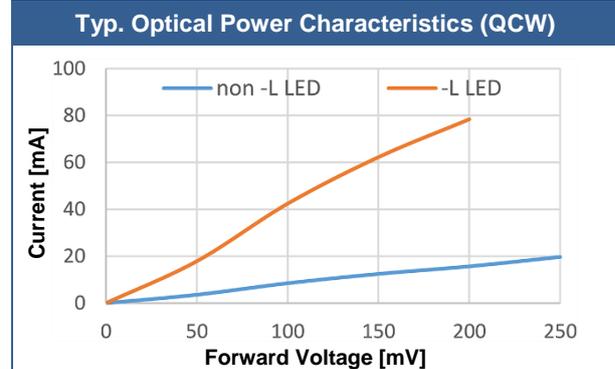
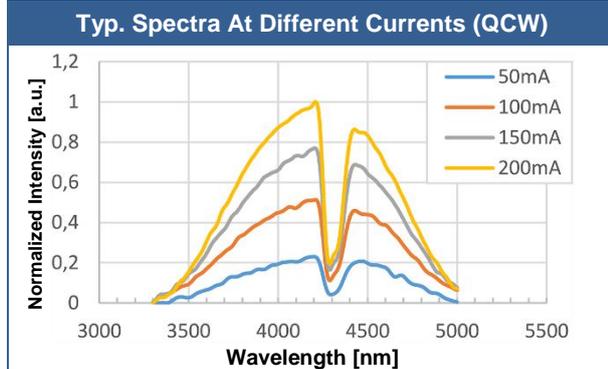
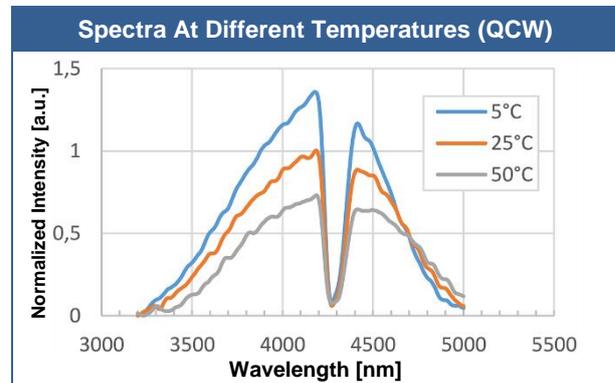
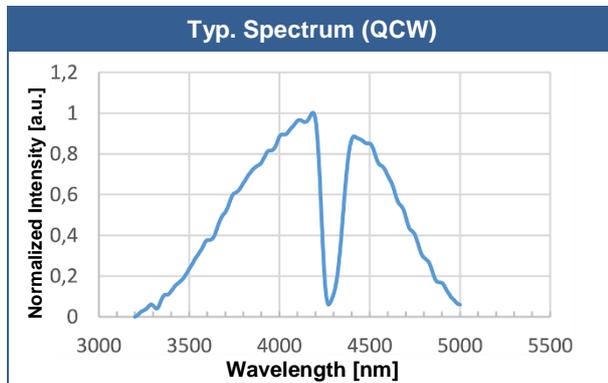
*2 Repetition rate: 0.5 kHz, pulse duration: 20 μs , duty cycle: 1%, current: 1 AAll parameters refer to LEDs in TO18 package with a cavity and operation at ambient temperature 25 $^{\circ}\text{C}$ unless otherwise stated.



Packages

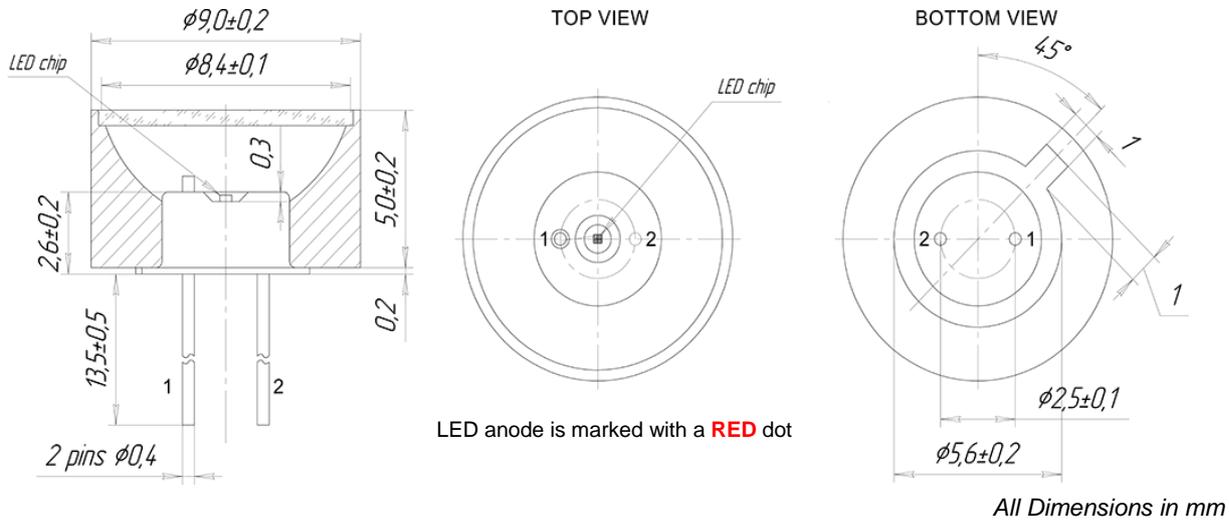
Part Number	Package
LED44	TO-18 with cap with no window
LED44-R	TO-18 with parabolic reflector with no window
LED44-RW	TO-18 with parabolic reflector with a sapphire window
LED44-TRW	TO-5 with built-in thermocooler and thermoresistor, with a reflector with a sapphire window
LED44-L	TO-18 with chalcogenide glass cover
LED44-LTRW	TO-5 with built-in thermocooler and thermoresistor, with a reflector with a sapphire window; chip with chalcogenide glass covering

Performance Characteristics

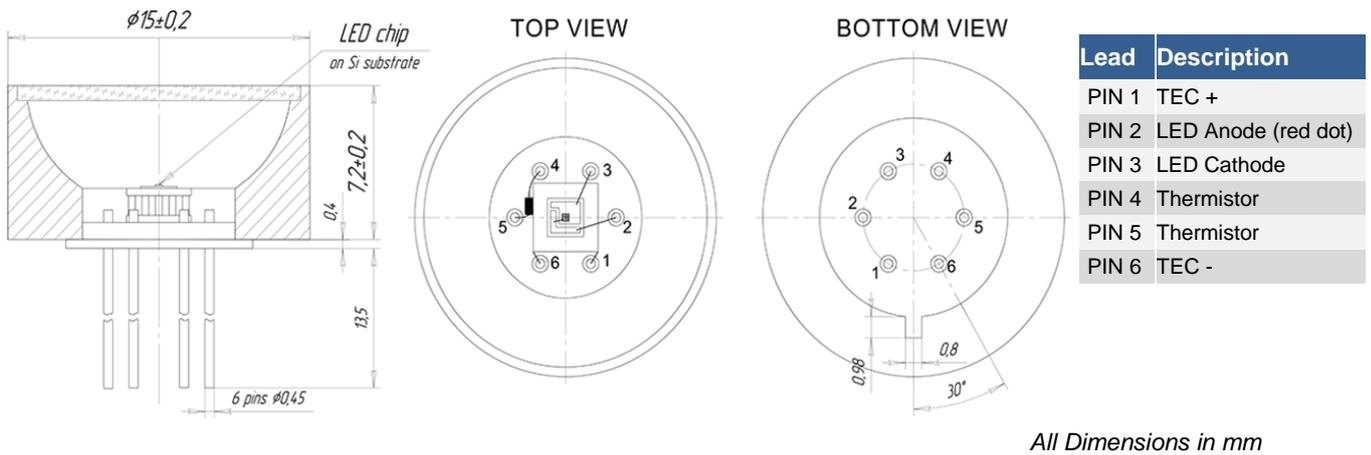




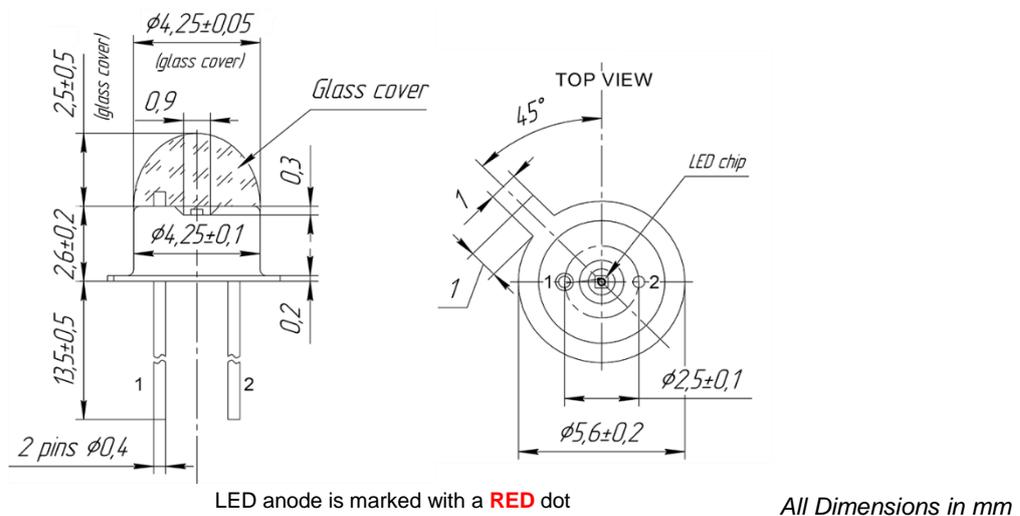
LED44-RW TO-18, with parabolic reflector and window



LED44-TRW TO-5, thermocooler and thermoresistor, cap and window



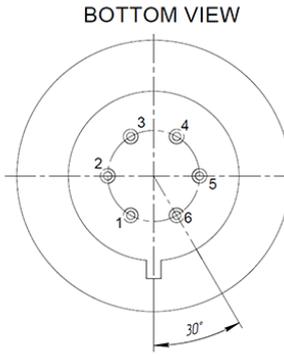
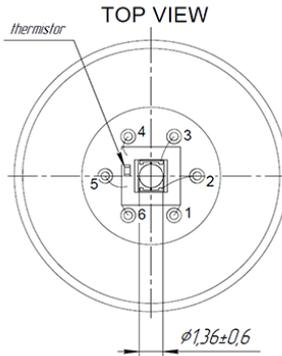
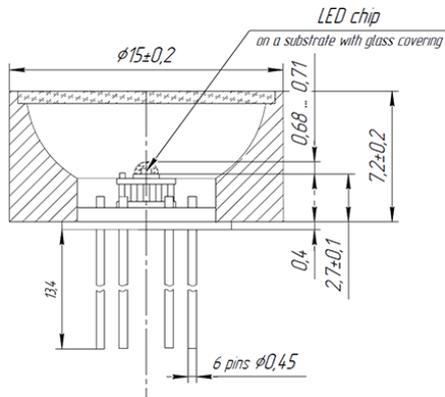
LED44-L TO-18, with glass cover





LED44-LTRW

TO-5, thermocooler and thermoresistor, cap and window

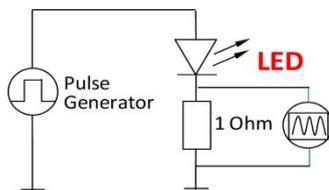


Lead	Description
PIN 1	TEC +
PIN 2	LED Anode (red dot)
PIN 3	LED Cathode
PIN 4	Thermistor
PIN 5	Thermistor
PIN 6	TEC -

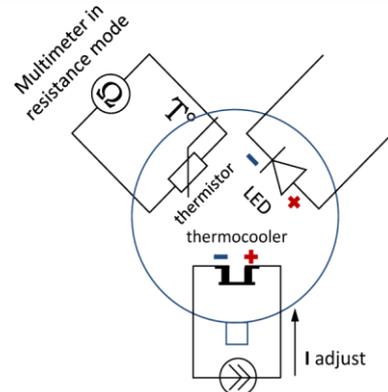
All Dimensions in mm

Operating Regime

LED Basic Circuit Connection



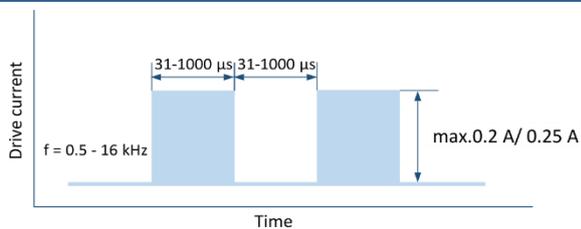
LED With Thermoelectric Module



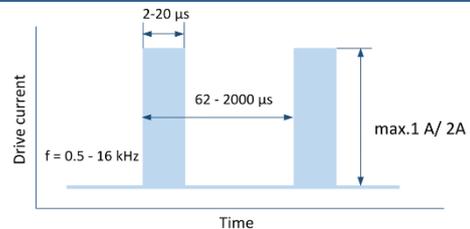
Constant current source

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.



Revisions History

Rev.	Rel. Date	Chapter	Modification	Page
A1	2022-09-30	-	Initial release	-

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The above specifications are for reference purpose only and subjected to change without prior notice