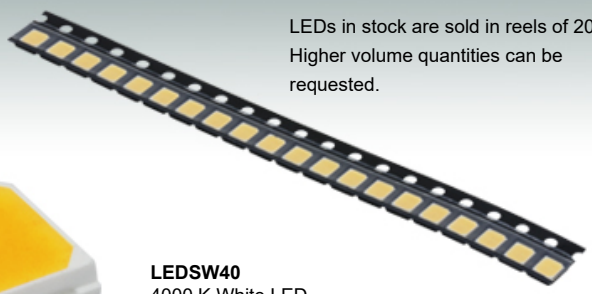
THORLABS
43 Sparta Avenue
Newton, NJ 07860 | Sales: (973) 300-3000 | www.thorlabs.com

LEDS450 - October 27, 2025

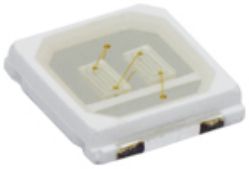
Item # LEDS450 was discontinued on October 27, 2025. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

UNMOUNTED LEDS IN SURFACE MOUNT TECHNOLOGY (SMT) PACKAGES

- **Surface Mount Device (SMD) LEDs for OEM Integration**
- **Single Color and White Light LEDs Available**
- **100 mW to 250 mW Optical Output Power**
- **Sold in Packs of 20; Higher Volume Quantities Available**

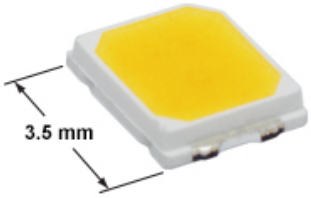


LEDs in stock are sold in reels of 20. Higher volume quantities can be requested.

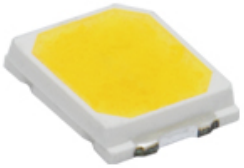


LEDS450
450 nm LED

LEDSW40
4000 K White LED



LEDSW30
3000 K White LED



LEDSW50
5000 K White LED

OVERVIEW

Features

Webpage Features	
	Clicking this icon opens a window that contains specifications, graphs, and mechanical drawings.
	Clicking this icon allows you to download our standard support documentation.

- Unmounted LEDs in Surface Mount Technology (SMT) Packages; Designed for Use in OEM Applications
- Four Wavelength Options
  - Single-Color LED at 450 nm
  - White Light LEDs (3000 K, 4000 K, and 5000 K)
- LED Optical Output Powers Ranging from 100 mW to 250 mW
- Compact 3.2 mm x 3.0 mm (LEDS450) and 3.5 mm x 2.8 mm (LEDSWxx) Package Size
- Sold in Packs of 20 LEDs; Higher Volume Quantities Available, Contact Tech Support with Inquiries
- Other LED Configurations Include Unmounted LEDs in TO-Can Packages and LEDs on Metal-Core PCBs (See *LED Selection Guide* Tab)

Light-Emitting Diodes (LEDs) are compact, energy-efficient light sources that can emit light over a wide range of wavelengths. Thorlabs offers LEDs with single-color and white-light wavelengths. These LEDs are epoxy sealed for protection. The white-light LEDs have a phosphor coating on the surface of the device that converts the 450 nm light emitted by the LED into white light. LEDs in stock come in packs of 20, packaged within a plastic reel as seen in the image above.

All the LEDs sold on this page are packaged as a surface mount device (SMD) for use in OEM manufacturing applications; the LED must be soldered onto a circuit board with an appropriate heat sink (up to 1.2 W heat dissipation) in order to be used. For laboratory applications, Thorlabs strongly recommends our large selection of pre-mounted LEDs because of their ease of use. For a full list of all our LED options, please see the *LED Selection Guide* tab. To discuss other options, please contact Tech Support.

These unmounted LEDs have large viewing angles, so for many applications it is beneficial to collimate the beam. See the *Collimation* tab for more information on collimating the light from an LED.

LEDs are sensitive to electrostatic shock. Please take the proper precautions when handling the device; see electrostatic shock accessories.

If you do not see an LED with the wavelength/color desired, please contact Technical Support, and we will work to obtain one for you and consider adding it to our permanent offerings.

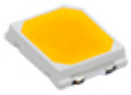
COLLIMATION

Video Insight: Collimate Light from an LED

Collimating light from an LED or other large, incoherent source can be a surprisingly challenging task. The emitter's size and the collimating lens' focal length and numerical aperture (NA) all influence the characteristics of the collimated beam. It can also be hard to know when the lens is positioned optimally. In Video 2.1, two lenses with different NAs and focal lengths are used to demonstrate a couple of collimation approaches. In addition, the emerging image of the emitter and other typical features of beams provided by collimating lenses are explored.

LED SELECTION GUIDE

This tab includes all LEDs sold by Thorlabs. Click on *More [+]* to view all available wavelengths for each type of LED pictured below.

Light Emitting Diode (LED) Selection Guide						More [+]
Click Photo to Enlarge (Representative; Not to Scale)						
Type	**Unmounted LEDs**	**Pigtailed LEDs**	**LEDs in SMT Packages**	**LED Arrays**	**LED Ring Light**	**Cage-Compatible Diffuse Backlight LED**
Light Emitting Diode (LED) Selection Guide						More [+]
Click Photo to Enlarge (Representative; Not to Scale)						
Type	**PCB-Mounted LEDs**	**Heatsink-Mounted LEDs**	**Collimated LEDs for Microscopy[b]**	**Fiber-Coupled LEDs[c]**	**High-Power LEDs for Microscopy**	**Multi-Wavelength LED Source Options[d]**

a. Measured at 25 °C
b. These Collimated LEDs are compatible with the standard and epi-illumination ports on the following microscopes: Olympus BX/IX (Item # Suffix: -C1), Leica DMI (Item # Suffix: -C2), Zeiss Axioskop (Item # Suffix: -C4), and Nikon Eclipse (Bayonet Mount, Item # Suffix: -C5).
c. Typical power when used with MM Fiber with Ø400 µm core, 0.39 NA.
d. Our Multi-Wavelength LED Sources are available with select combinations of the LEDs at these wavelengths.
e. Typical power for LEDs with the Leica DMI collimation package (Item # Suffix: -C2).
f. Minimum power for the collimated output of these LEDs. The collimation lens is installed with each LED.
g. Typical power for LEDs with the Olympus BX and IX collimation package (Item # Suffix: -C1).
h. Percentage of LED intensity that emits in the blue portion of the spectrum, from 400 nm to 525 nm.

Single-Color LED

Item #	Info	Center Wavelength[a]	Optical Power (@ 150 mA)	Bandwidth (FWHM)[a]	Viewing Half Angle[a]	DC Forward Current (Max)[b]	Forward Voltage (Max)[b]	Emitter Size	Lifetime (Min)[b,c]
LEDS450		450 nm	250 mW	13 nm	46°	180 mA	6.6 V	1 mm x 0.5 mm (Two Emitters)	>25 000 hrs

a. Typical values unless otherwise noted.
b. Temperature: 25 °C
c. Lifetime is defined as the time required for the LED light output to drop by 50% when driven at 150 mA.

Part Number	Description	Price	Availability
LEDS450	LED in SMT Package, 450 nm, 250 mW, Qty. 20	$14.62	Today

White Light LEDs

Item #	Info	Correlated Color Temperature[a]	Optical Power (@ 150 mA)	CRI (Min)[b]	Viewing Half Angle[a]	DC Forward Current (Max)[c]	Forward Voltage (Max)[b]	Emitter Size	Lifetime (Min)[c,d]
LEDSW30		3000 K	100 mW	90	50°	180 mA	3.6 V	2.6 mm x 3.2 mm	>25 000 hrs
LEDSW40		4000 K	115 mW	90	50°	180 mA	3.7 V	2.6 mm x 3.2 mm	>25 000 hrs
LEDSW50		5000 K	110 mW	90	50°	180 mA	3.6 V	2.6 mm x 3.2 mm	>25 000 hrs

a. Typical values unless otherwise noted.
b. Color Rendering Index (CRI) indicates on a scale from 0 to 100 how accurately the spectrum matches a reference source.
c. Temperature: 25 °C
d. Lifetime is defined as the time required for the LED light output to drop by 50% when driven at 150 mA.

Part Number	Description	Price	Availability
LEDSW30	White LED in SMT Package, 3000 K, 100 mW, Qty. 20	$13.47	Today
LEDSW40	White LED in SMT Package, 4000 K, 115 mW, Qty. 20	$13.47	Lead Time
LEDSW50	White LED in SMT Package, 5000 K, 110 mW, Qty. 20	$13.47	Today

LEDS450 - LED in SMT Package, 450 nm, 250 mW, Qty. 20

Specifications | L-I-V | Far Field | Spectrum | Temperature | Drawing

Specifications[a]

Characteristic	MIN	TYP	MAX	UNIT
Peak Wavelength	445	450	455	nm
Operating Current (Continuous)	-	150	-	mA
Forward Voltage at 150 mA	6.0	6.3	6.6	V
Optical Output Power at 150 mA	-	250	-	mW
Viewing Half Angle	-	46	-	°
Bandwidth (FWHM)	-	13	-	nm
Lifetime[b]	25000	-	-	hours

a. Mount Temperature at 25 °C
b. The Lifetime is defined as the time required for the LED light output to drop by 50% when driven at 150 mA.

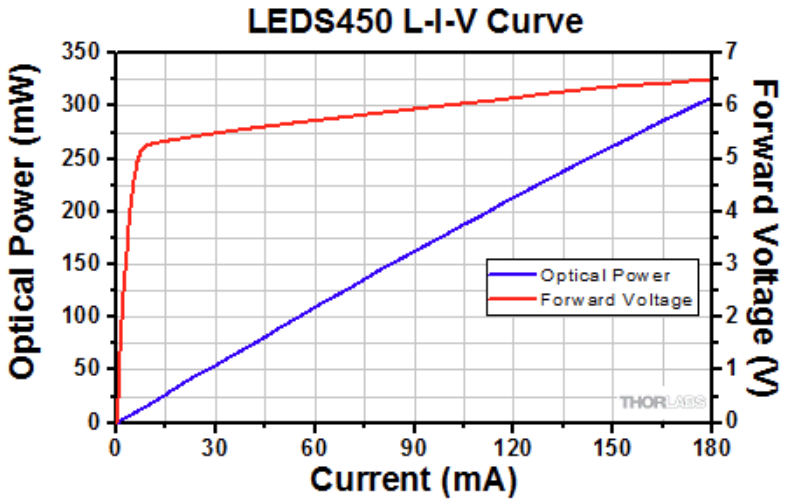
Absolute Maximum Ratings[a]

Characteristic		
Reverse Voltage	5	V
DC Forward Current	180	mA
Operating Case Temperature	-30 to 80	°C
Storage Temperature	-30 to 85	°C

a. Absolute Maximum Rating specifications should never be exceeded. Operating beyond these conditions can seriously damage the LED.

LEDS450 - LED in SMT Package, 450 nm, 250 mW, Qty. 20

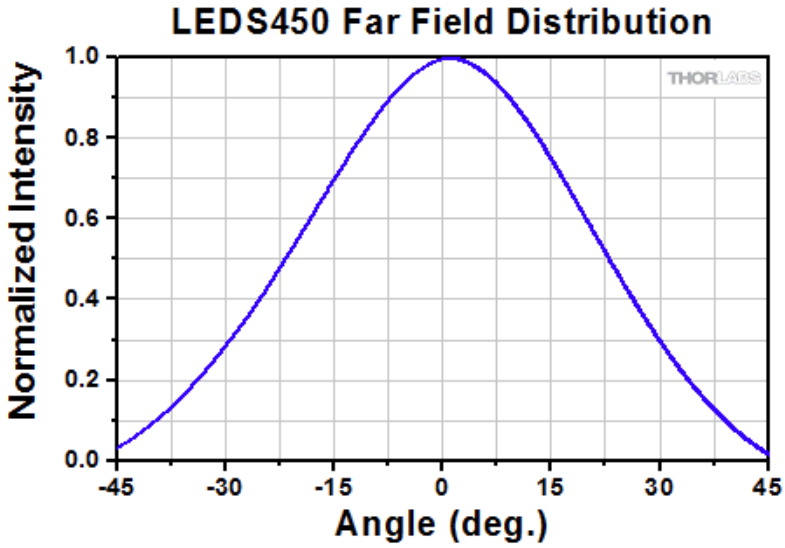
Specifications | L-I-V | Far Field | Spectrum | Temperature | Drawing



The typical L-I-V characteristics are shown above, which were obtained with the case temperature held at 25 °C.

LEDS450 - LED in SMT Package, 450 nm, 250 mW, Qty. 20

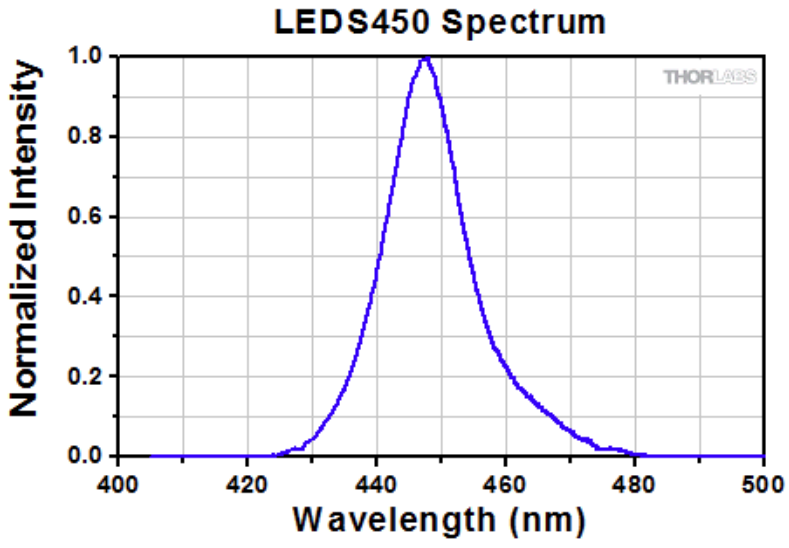
Specifications | L-I-V | Far Field | Spectrum | Temperature | Drawing



The typical far field intensity distribution is shown above, which was recorded 11.5 mm from the LED with the case temperature held at 25 °C.

LEDS450 - LED in SMT Package, 450 nm, 250 mW, Qty. 20

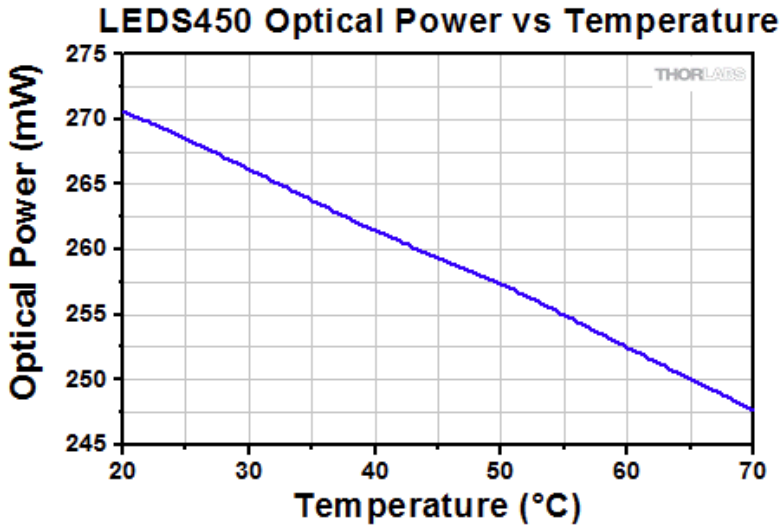
Specifications | L-I-V | Far Field | Spectrum | Temperature | Drawing



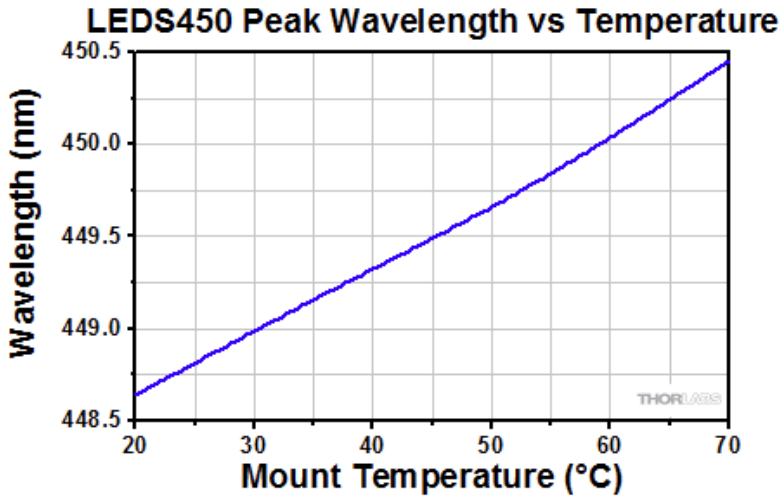
Typical spectrum is shown above at a test temperature of 25 °C

LEDS450 - LED in SMT Package, 450 nm, 250 mW, Qty. 20

Specifications | L-I-V | Far Field | Spectrum | **Temperature** | Drawing



Optical Power versus Mount Temperature at 150 mA



Peak Wavelength versus Mount Temperature at 150 mA. Measured with a CCS100 Spectrometer.

LEDS450 - LED in SMT Package, 450 nm, 250 mW, Qty. 20

Specifications | L-I-V | Far Field | Spectrum | Temperature | **Drawing**