WP25LM-IRC - July 18, 2025

Item # WP25LM-IRC was discontinued on July 18, 2025. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

MIR WIRE GRID POLARIZERS ON SILICON SUBSTRATES

- **Wavelength Range: 3 - 5 µm or 7 - 15 µm**
- **Ø25.0 mm, 12.5 mm Square, 25.0 mm Square, or 50.0 mm Square**
- **>1000:1 or >10 000:1 Extinction**

WP12LM-IRA
12.5 mm x 12.5 mm

WP25M-IRC
Ø25.0 mm

WP25LM-IRA
25.0 mm x 25.0 mm

WP50LM-IRC
50.0 mm x 50.0 mm

WP25M-IRA Mounted in an RSP1X15 Rotation Mount

OVERVIEW

Features

- Polarize Light from 3 - 5 µm or 7 - 15 µm
- Extinction Ratio:
  - 3 - 5 µm (-IRA): >1000:1
  - 7 - 15 µm (-IRC): >10 000:1
- Offered in Four Sizes
  - Ø25.0 mm
  - 12.5 mm x 12.5 mm
  - 25.0 mm x 25.0 mm
  - 50.0 mm x 50.0 mm
- Anodized Aluminum Mount with Transmission Axis Indicated

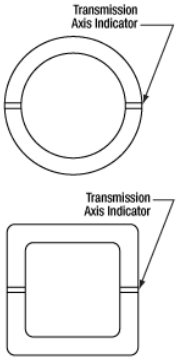


Figure 1.1 The engraving on the housing is parallel to polarized transmitted light and perpendicular to the orientation of the wires.

The mounted wire grid polarizers on silicon substrates sold here are designed to provide high extinction over two spectral ranges in the mid-IR: 3 - 5 µm (3333 - 2000 cm^{-1}) or 7 - 15 µm (1429 - 667 cm^{-1}). The 3 - 5 µm versions (denoted by -IRA) offer >1000:1 extinction and >85% average transmission over their specified range, while the 7 - 15 µm versions (denoted by -IRC) offer >10 000:1 extinction and >75% average transmission over their specified range. Wavelength-dependent plots of the transmission are available in the *Specs* tab. The polarizers are recessed inside Ø25.0 mm, 12.5 mm square, 25.0 mm square, or 50.0 mm square mounts fabricated from anodized aluminum. As shown in Figure 1.1, the mounts are engraved with the polarization axis of the transmitted light.

These MIR polarizers consist of a linearly spaced wire grid pattern that is deposited onto an AR-coated silicon substrate. Silicon was chosen because it offers good transmission in the mid-IR wavelength range. Because the wire grid absorbs and reflects radiation that is polarized parallel to the grid, the polarization of the transmitted radiation is perpendicular to the wires. These polarizers feature a mark on the housing to indicate the transmission axis (see Figure 1.1).

For smooth attenuation over the specified wavelength range and fine control over the output polarization direction, we recommend the Ø25.0 mm versions, which are well suited for use with our family of rotation mounts for Ø1" optics. The 12.5 mm square, 25.0 mm square, and 50.0 mm square versions can be secured in a cylindrical lens mount. Since our cylindrical lens mounts do not provide rotation, the square polarizers are best for applications that only require horizontal or vertical polarization.

The surface of a wire grid polarizer, like any diffraction grating, is extremely delicate. Never touch the surface of the polarizer, and only handle it by the edge. Careful removal of dust by gentle air flow is the only recommended cleaning procedure.

For broadband applications in the MIR, Thorlabs offers holographic wire grid polarizers for the 2 - 30 µm spectral range. In addition, we have wire grid polarizers on glass substrates for the 300 nm - 3.2 µm spectral range, which help enable the use of a visible alignment beam in a mid-IR experiment. For our complete selection of polarizers, please see the *Polarizer Guide* tab.

SPECS

Item #	WP12LM-IRA	WP25M-IRA	WP25LM-IRA	WP50LM-IRA	WP12LM-IRC	WP25M-IRC	WP25LM-IRC	WP50LM-IRC
Wavelength Range	3 - 5 µm (3333 - 2000 cm^{-1})				7 - 15 µm (1429 - 667 cm^{-1})			
Extinction Ratio[a]	>1000:1 Over Entire Wavelength Range				>10 000:1 Over Entire Wavelength Range			
Transmission[b]	>85% (Average) Over Wavelength Range				>75% (Average) Over Wavelength Range			
Housing Size	12.5 mm x 12.5 mm	Ø25.0 mm	25.0 mm x 25.0 mm	50.0 mm x 50.0 mm	12.5 mm x 12.5 mm	Ø25.0 mm	25.0 mm x 25.0 mm	50.0 mm x 50.0 mm
Housing Thickness	5.8 mm	5.8 mm	5.8 mm	5.8 mm	5.8 mm	5.8 mm	5.8 mm	5.8 mm
Clear Aperture	6.0 mm x 6.0 mm[c]	Ø19.0 mm	18.0 mm x 18.0 mm[c]	42.0 mm x 42.0 mm[c]	6.0 mm x 6.0 mm[c]	Ø19.0 mm	18.0 mm x 18.0 mm[c]	42.0 mm x 42.0 mm[c]
Transmission Axis Accuracy[d]	±2°							
Angle of Incidence	±20°							
Distance Between Wires	144 nm							
Wire Thickness	65 nm							
Thermal Expansion	2.6 x 10^{-6} per °C							
Substrate	AR-Coated Silicon							

a. The extinction ratio (ER) is the ratio of maximum to minimum transmission of a sufficiently linearly polarized input. When the transmission axis and input polarization are parallel, the transmission is at its maximum; rotate the polarizer by 90° for minimum transmission.
b. Specified at normal incidence for light polarized parallel to the transmission axis of the polarizer.
c. As shown in Figure 2.1, our square mid-IR polarizers have rounded corners that slightly reduce the clear aperture of the optic.
d. With respect to the engraved line on the housing, as shown in Figure 2.1.

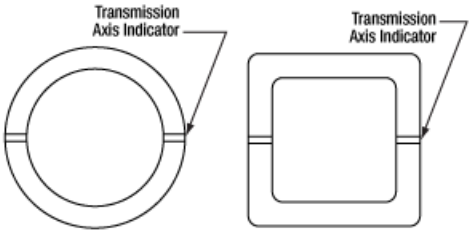
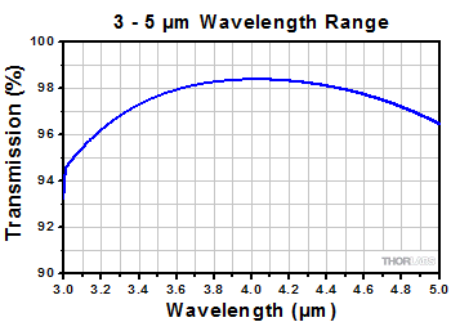
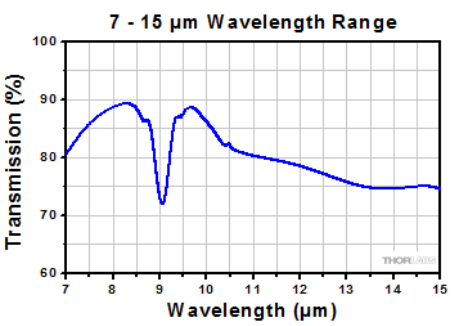


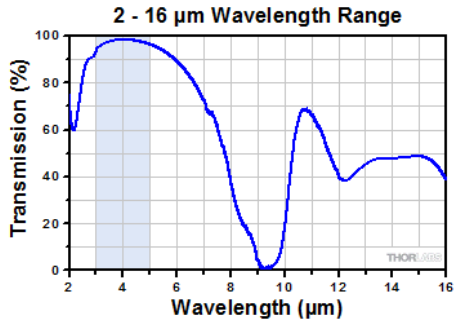
Figure 2.1 Engraving is Parallel to Transmitted Light Polarization



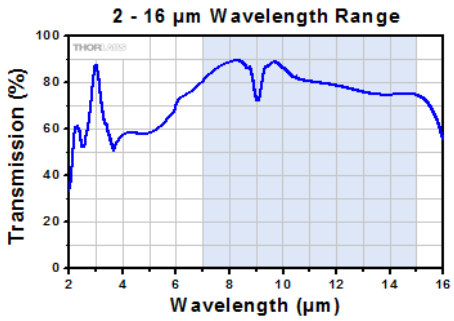
Transmission of 3 - 5 µm Polarizers



Transmission of 7 - 15 µm Polarizers



Extended-Range Transmission of 3 - 5 µm Polarizers
The shaded region in this graph denotes the range over which these polarizers provide >1000:1 extinction.



Extended-Range Transmission of 7 - 15 µm Polarizers
The shaded region in this graph denotes the range over which these polarizers provide >10 000:1 extinction.

POLARIZER GUIDE

Polarizer Selection Guide

Thorlabs offers a diverse range of polarizers, including wire grid, film, calcite, alpha-BBO, rutile, and beamsplitting polarizers. Collectively, our line of wire grid polarizers offers coverage from the visible range to the beginning of the Far-IR range. Our nanoparticle linear film polarizers provide extinction ratios as high as 100 000:1. Alternatively, our other film polarizers offer an affordable solution for polarizing light from the visible to the Near-IR. Next, our beamsplitting polarizers allow for use of the reflected beam, as well as the more completely polarized transmitted beam. Finally, our alpha-BBO (UV), calcite (visible to Near-IR), rutile (Near-IR to Mid-IR), and yttrium orthovanadate (YVO_4) (Near-IR to Mid-IR) polarizers each offer an exceptional extinction ratio of 100 000:1 within their respective wavelength ranges.

To explore the available types, wavelength ranges, extinction ratios, transmission, and available sizes for each polarizer category, click *More [+]* in the appropriate row below.

Wire Grid Polarizers	More [+]
Film Polarizers	More [+]
Beamsplitting Polarizers	More [+]
alpha-BBO Polarizers	More [+]
Calcite Polarizers	More [+]
Quartz Polarizers	More [+]
Magnesium Fluoride Polarizers	More [+]
Yttrium Orthovanadate (YVO_4) Polarizers	More [+]
Rutile Polarizers	More [+]

a. Click on the graph icons in this column to view a transmission curve for the corresponding polarizer. Each curve represents one substrate sample or coating run and is not guaranteed.
b. Mounted in a protective box, unthreaded ring, or cylinder.
c. Available unmounted or mounted in cubes for cage system compatibility.
d. Available unmounted or in an SM05-threaded (0.535"-40) mount that indicates the polarization axis.
e. Available unmounted or in an SM1-threaded (1.035"-40) mount that indicates the polarization axis.
f. PBS519: Average T_P:T_S > 1000:1
g. Calcite's transmittance of light near 350 nm is typically around 75% (see *Transmission* column).
h. Available unmounted or in an unthreaded Ø1/2" housing.
i. The transmission curves for calcite are valid for linearly polarized light with a polarization axis aligned with the mark on the polarizer's housing.
j. The 1064 nm V coating corresponds to a -C26 suffix in the item number.
k. Available unmounted or mounted in a protective box or unthreaded cylinder that indicates the polarization axis.

MIR Wire Grid Polarizers, 3 - 5 µm

Part Number	Description	Price	Availability

WP12LM-IRA	12.5 mm x 12.5 mm Mounted Wire Grid Polarizer, 3 - 5 µm	$1,004.14	Today
WP25M-IRA	Ø25.0 mm Mounted Wire Grid Polarizer, 3 - 5 µm	$1,680.36	Today
WP25LM-IRA	25.0 mm x 25.0 mm Mounted Wire Grid Polarizer, 3 - 5 µm	$1,633.32	Today
WP50LM-IRA	50.0 mm x 50.0 mm Mounted Wire Grid Polarizer, 3 - 5 µm	$2,303.20	Lead Time

MIR Wire Grid Polarizers, 7 - 15 µm

Part Number	Description	Price	Availability
WP12LM-IRC	12.5 mm x 12.5 mm Mounted Wire Grid Polarizer, 7 - 15 µm	$1,004.14	Today
WP25M-IRC	Ø25.0 mm Mounted Wire Grid Polarizer, 7 - 15 µm	$1,680.36	Lead Time
WP25LM-IRC	25.0 mm x 25.0 mm Mounted Wire Grid Polarizer, 7 - 15 µm	$1,633.32	Lead Time
WP50LM-IRC	50.0 mm x 50.0 mm Mounted Wire Grid Polarizer, 7 - 15 µm	$2,303.20	Today