Optics

Silicon Infrared Polarizer

SIR Series Datasheet

Courtesy NASA/JPL-Caltech/WISE Team. Andromeda Galaxy. Red represent light from 12 and 22 microns, which is mostly emitted by dust.

Applications

- Astronomy
- Forensics
- Medical
- Microscopy
- NVG (Night Vision Goggles), low light imaging
- Thermal imaging
- Spectroscopy
- Security
- Faraday Isolators

The ProFlux® SIR Series Infrared polarizers, designed using Moxtek® Nanowire® Technology, provide unparalleled broadband infrared performance. Moxtek's high volume production capacity ensures availability and our customization supports different sizes and shapes for even the most unique applications.

SIR polarizers are designed and manufactured to support your broadband application design goals. The SIR3-5 Infrared Polarizer is optimized for applications in the 3-5µm wavelength range providing high transmission and contrast. Likewise the SIR7-15 Infrared Polarizer is designed for high transmission and excellent contrast in the 7-15µm range. These polarizers utilize the unique qualities of thin silicon substrates with specially engineered anti-reflective coatings to achieve high performance.

Features	Benefits
Nanowire Technology	Brightness and contrast uniformity
	>20˚ half angle without performance loss
	Wavelength and AOI independent
	Broadband
Inorganic	High reliability
	High heat resistance

Substrate Specifications

Type: Silicon
Thickness: 0.7mm ± 0.07
Index of Refraction: 3.421 at 10.33µm
3.427 at 4.132µm
Thermal Expansion: 2.6 x 10^{-6}/°C

General Specifications

AR Coating: Custom engineered for mid-wave or long-wave IR
Dimensional Tolerance: ± 0.4mm
Edge Exclusion: 2mm
Transmission Axis (TA): ± 2˚
Angle of Incidence: 0˚± 20˚
Maximum Temperature: Reliability currently being evaluated
Part Shape: Square or rectangle

MOXTEK®

ProFlux Nanowire® Technology

SIR Series Performance Specifications Table

	3.0-3.7 µm		3.7-5.0 µm		7.0-8.8 µm		8.8-15 µm		10.6 µm	
	MIN Tp (%)	MIN Contrast	MIN Tp (%)	MIN Contrast	MIN Tp (%)	MIN Contrast	MIN Tp (%)	MIN Contrast	MIN Tp (%)	MIN Contrast
SIR3-5	85	5,000 (37dB)	94.5	7,000 (38.5dB)			-	-	-	-
SIR7-15	-	-	-	-	78	7,000 (38.5dB)	68	10,000 (40dB)	82	10,000 (40dB)

Laser Damage Threshold (LDT) Table

	LDT Results (kW/cm^2)		LDT Test Parameters		
Product	Blocking	Passing	Wavelength	Diameter of Beam (µm)	Exposure Duration
SIR3-5*	0.646	>14	3.3 µm	150	30 sec.
SIR7-15	100	10	10.6 µm	360	20 sec.

Disclaimer:The least fluence failure Laser Damage Threshold (LDT) performance results listed above should be used as a design guideline and do not represent a guarantee of performance in any given application.

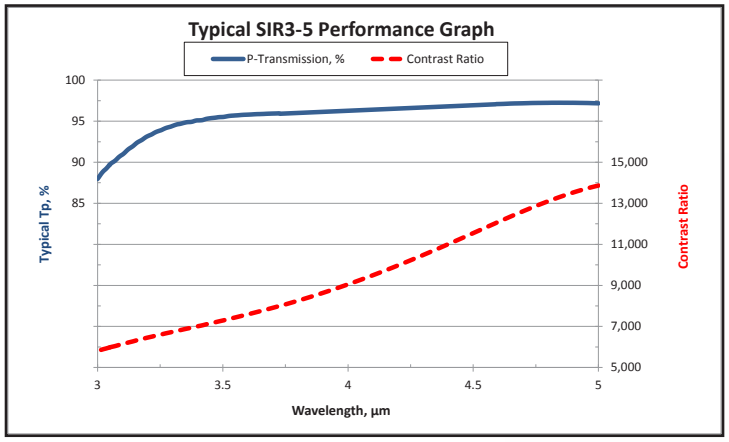
*7 ns, 25 kHz pulsed OPO source

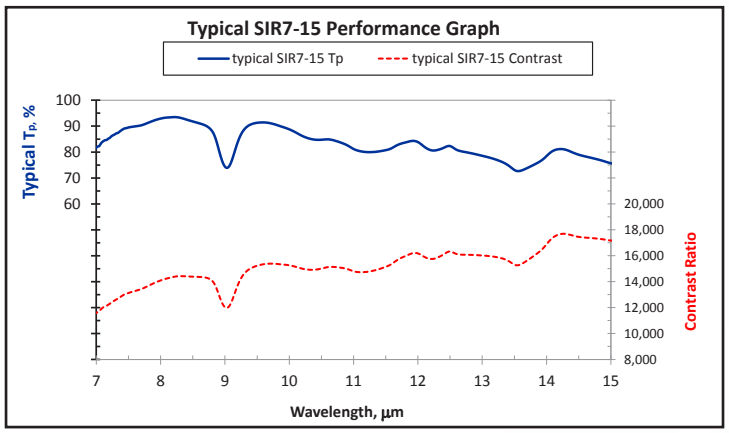
Performance Specifications at Normal Incidence

Note: Performance specifications are under evaluation. They are expected to be similar to the plots below.

The SIR3-5 performance graph is shown below. Transmission in the passing state is generally above 85% (<0.71dB insertion loss) with contrast greater than 5,000:1 (>37dB). This product is designed for use in the 3-5µm portion of the mid-wavelength IR.

The SIR7-15 performance graph is shown below. Transmission in the passing state is generally above 68% (<1.68dB insertion loss) with contrast greater than 10,000:1 (>40dB). This product is designed for use in the 7-15µm portion of the long-wavelength IR.





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