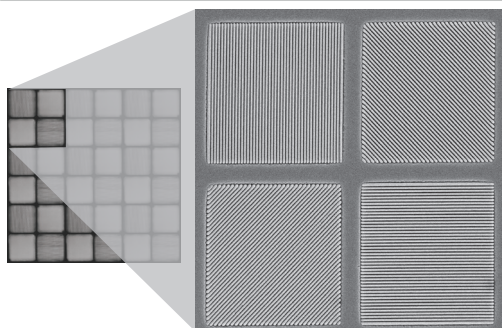


Pixelated Polarizers

PIX Series Datasheet



Four State Pixelated Polarizer Array

Applications

- Polarimetry and 3D Cameras
- Biometric Facial Recognition
- Polarization Microscopy
- Polarized Fiber-Optic Probes
- Remote Sensing
- Interferometry
- Pollution Detection
- Micro and Nano Optics

Standard Product Options

Product Name	Pixel Pitch	Pixel Size
PIX055	5.5μm	4.5μm
PIX058C	5.86μm	4.86μm
PIX065C	6.5μm	5.5μm
PIX074C	7.4μm	6.4μm
PIX080C	8.0μm	7.0μm
PIX088	8.8μm	7.8μm
PIX090C	9.0μm	8.0μm
PIX098	9.8μm	8.8μm
PIX100	10.0μm	9.0μm
PIX150	15.0μm	14.0μm
PIX156	15.6μm	14.6μm
PIX300	30.0μm	29.0μm

See page 2 for Dimension details.

Standard products are four state pixelated polarizers with a visible AR Coating.

Contact Moxtek for custom options.

See OPT-DATA-1011 for size and mounting options

Pixelated polarizers are designed to incorporate different polarization angles into a single array, which can be aligned with CCD/CMOS camera arrays, enabling real-time polarimetry. Traditional polarimetry requires multiple images be taken with different polarizations and multiple cameras precisely aligned to each other. The resulting image data must then be carefully overlaid and aligned which requires added time, equipment, and precision. Pixelated polarizers enable real-time imaging when speed and resolution is critical. Recently, Moxtek has further developed a NanoImprint Lithography (NIL) fabrication process, rendering improved performance and uniformity across pixels while allowing potential wafer level imprint with alignment.

Features	Benefits
Nanowire® Technology	Superior Transmission and Contrast
	±20° AOI Without Depolarization
	Wavelength and AOI Independent
	Visible and IR Wavelengths
	Broadband Visible and IR Wavelengths
NIL Pixelation	User Defined Pixel Geometries and Layouts
	Uniform Cross-Pixel Performance
	Potential Wafer-Level Imprint with Alignment
Inorganic	High Heat Resistance

General Specifications

Visible Options	IR Options
<i>Wavelength Range:</i> 400-700nm (400-2500nm upon request)	3-5μm, 8-12μm
<i>Substrate Type:</i> Display Grade Glass	Silicon
<i>Thickness:</i> 0.7 ± 0.07mm	0.675 ± 0.095mm
<i>Index of Refraction:</i> 435.8nm: 1.5198	10.33μm: 3.421
	4.132μm: 3.427
<i>Thermal Expansion:</i> 31.7 x 10 ⁻⁷ /°C (0-300°C)	2.6 x 10 ⁻⁶ /°C
<i>AOI (Angle of Incidence):</i> 0° ± 20°	0° ± 20°
<i>AR Coating:</i> Depending on operation wavelength	Depending on operation wavelength
<i>Maximum Temperature:</i> 200°C, > -5,000 hours	200°C, > -5,000 hours
<i>Transmission Axis (TA):</i> Referenced to long side	Referenced to long side
<i>TA Tolerance:</i> ± 1°	± 1°
<i>RoHS:</i> Compliant	Compliant
<i>Transmission:</i> >80% @ 632nm at pixel center	Contact Moxtek for information
<i>Contrast Ratio:</i> >200:1 @ 632nm at pixel center	Contact Moxtek for information

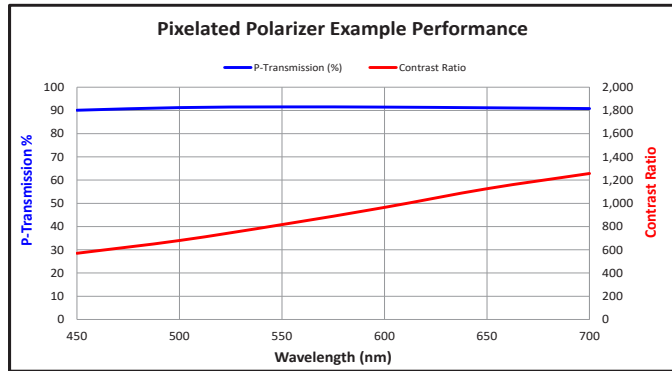
Do not touch or clean the wire-grid polarizer surface otherwise the polarizer will be damaged.



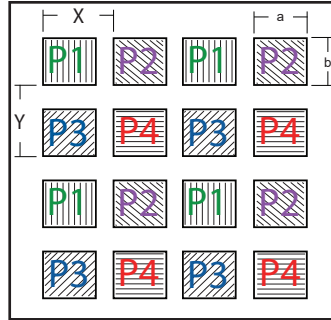
Standard Dimensional Specifications

Polarizer Pixel Pitch (X, Y): See page 1 for Standard Product Options

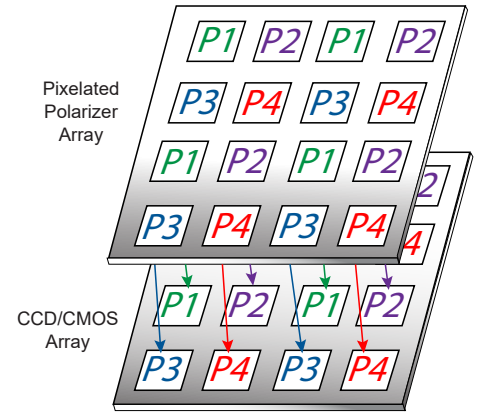
Polarizer Pixel Size (a, b): See page 1 for Standard Product Options



Performance assuming no cross talk between pixels.
Performance data was taken from sample evaluations. Some part-to-part variation is expected.



Typical layout of a 4-state pixelated polarizer array.



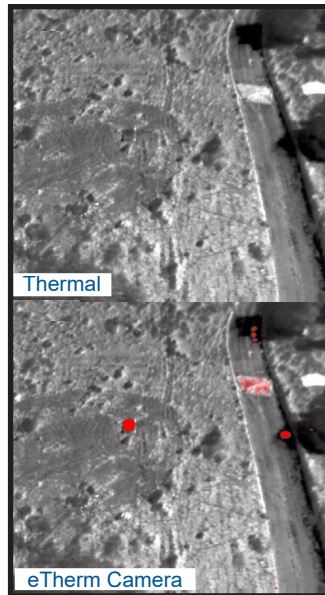
Pixelated polarizer aligned to camera array.

Application Examples of Quantitative Thermal Polarization Imaging

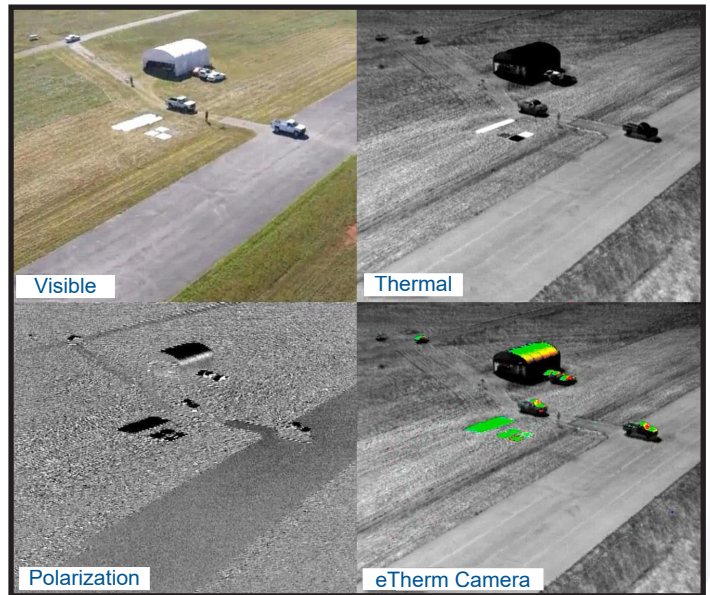
Pixelated polarizers are designed to align with CCD/CMOS camera arrays to create imaging polarimeters, which map a scene of interest using the polarization state of light instead of color as in traditional cameras. Polarization provides high contrast information about surface features such as shape, shading, and roughness. Traditional methods require combining and precisely aligning data from two separate images which requiring added time, equipment, and space. The pixelated polarizer, when attached to an image sensor, enables a number of different types of images to be obtained simultaneously as illustrated in the figures below. Photos courtesy of Polaris Sensor Technologies and taken with Pyxis LWIR camera (PolarisSensor.com).



Visible and eTherm (Thermal + Polarization) images identifying oil spill after a marina fire near Huntsville, AL.



Thermal and eTherm images for target identification.



Visible, Thermal, Polarization and processed eTherm images showing different data products in a target identification application.

Photos courtesy of Polaris Sensor Technologies and taken with Pyxis LWIR camera (PolarisSensor.com).

For warranty and ordering information, please visit www.moxtek.com.



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