

Close-up of 4 State Pixelated Polarizer Array

### Applications

- Polarimetry and 3D Cameras
- Biometric facial recognition
- Biological Analysis
- Cell differentiation
- Polarization Microscopy
- Polarized Fiber-optic Probes
- Remote Sensing
- Target discrimination
- Interferometry
- Pollution Detection

### Standard Product Options

Product Name	Description
PIX058C	5.8µm pixels
PIX065C	6.5µm pixels
PIX074C	7.4µm pixels
PIX080C	8.0µm pixels
PIX090C	9.0µm pixels

\*Standard products come with visible AR Coating. For non\_AR coated requirement, please contact us for more information.

\*Other customized pixel sizes are available. Please contact us for more information.

\*4 state polarizers are standard. 2 state polarizers also available. For other options, please contact us for more information.

\*See OPT-DATA-1011 for size and mounting options

Pixelated polarizers are designed to align with CCD/CMOS camera arrays. Pixelated polarization enables real-time 3D imaging without camera image overlay. Traditional 3D imaging requires two images be taken with different polarizations and two cameras precisely aligned to each other. The resulting image data must then be carefully overlaid and aligned which requires added time, equipment, space, and precision. Pixelated polarizers enable real-time, clear imaging when speed and resolution is critical. Contact Moxtek for alignment options.

Features	Benefits
Nanowire® Technology	Brightness and contrast uniformity
	±20° AOI without depolarization
	Wavelength and AOI independent
	Visible and IR wavelengths
Pixelation	Broadband
	User defined geometries
	Low cross-talk
	Accurate registration
Inorganic	Allows for single camera systems
	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>	0.7mm ± 0.07mm	0.675mm ± 0.095mm
<i>Index of Refraction:</i>	435.8nm: 1.5198 643.8nm: 1.5078	10.33nm: 3.421 4.132nm: 3.427
<i>Thermal Expansion:</i>	31.7 x 10 <sup>-7</sup> /°C (0-300°C)	2.6 x 10 <sup>-6</sup> /°C
<i>AOI (Angle of Incidence):</i>	0° ± 20°	0° ± 20°
<i>AR Coating:</i>	Optional and depends on operation wavelength	Optional and depends 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>Dimensional Tolerance:</i>	± 0.2mm	± 0.4mm
<i>Edge Exclusion:</i>	2mm	2mm
<i>RoHS:</i>	Compliant	Compliant
<i>Transmission:</i>	>80% @ 633nm at pixel center	Contact us for information
<i>Contrast Ratio:</i>	>200:1 @ 633nm at pixel center	Contact us for information

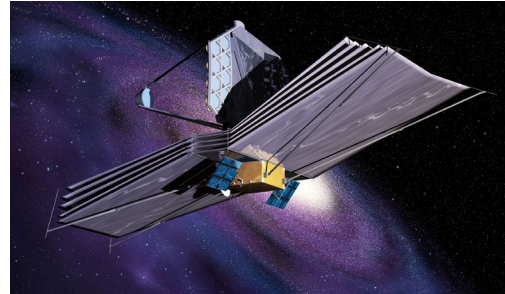
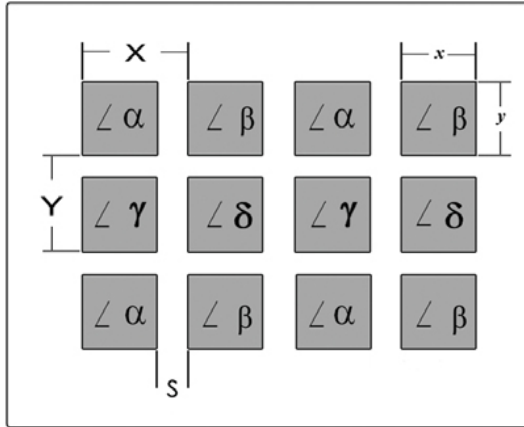
## Standard Dimensional Specifications

*Pixel Pitch (X, Y):* 5.8, 6.5, 7.4, 8.0, 9.0 $\mu\text{m}$  standard (custom pitch sizes available)

*Feature Dimensions(x, y):* Pixel aperture dimensions (typical pitch: -1 $\mu\text{m}$ )

*Feature Spacing (S):*  $\geq 1\mu\text{m}$

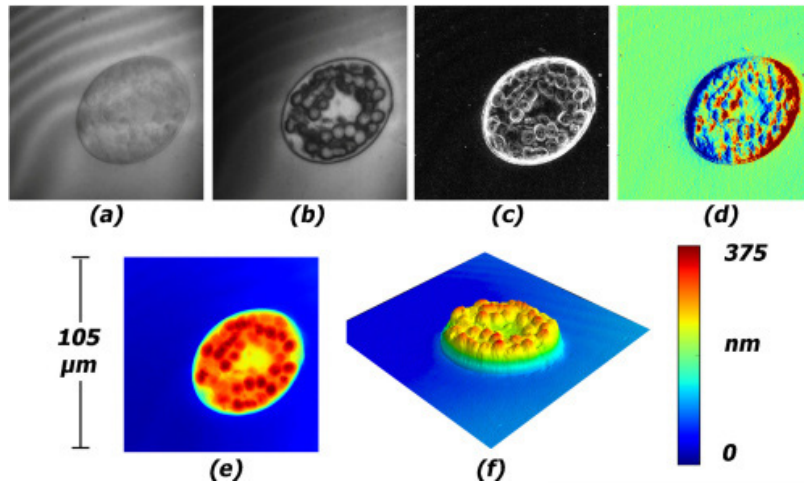
*Max Number of Polarization Axes:* 4 angle ( $\alpha$ ,  $\beta$ ,  $\gamma$ , and  $\delta$ ) line scan row arrangement available also



Courtesy ESA. To meet the extreme polishing and surface requirements of the James Webb Telescope, a new interferometer was developed with advanced, state-of-the-art defining capabilities using Moxtek's pixelated polarizer technology.

## Application Example of Dynamic Quantitative Phase Imaging

The pixelated phase mask sensor enables a number of different types of images to be obtained simultaneously as illustrated in images of a protozoa in the figure below.



Images of a protozoa determined from pixelated phase data. (a) Brightfield (irradiance/intensity). (b) Phase contrast (interference – a single interferogram). (c) Phase gradient magnitudes (simulated dark field). (d) Simulated DIC (x gradient). (e) Pseudo-colored optical thickness (from phase). (f) 3D optical thickness (from phase).

Dynamic quantitative phase imaging for biological objects using a pixelated phase mask, Biomedical Optics Express, Vol. 3, Issue 11, pp. 2866-2880 (2012)

For warranty and ordering information, please visit [www.moxtek.com](http://www.moxtek.com).



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The U.S. Department of State has determined that Pixelated Polarizers are not ITAR-controlled. Pixelated Polarizers that extend the usable spectrum beyond 3 microns (into the MWIR and LWIR ranges) are EAR-controlled with an ECCN of 0A521. Pixelated Polarizers that do not extend the usable spectrum beyond 3 microns are EAR-controlled with an ECCN of EAR99 (See CJ 142-14).