

# Polarizing Beamsplitter Plate

PBS Plate Series Datasheet



PBS Beamsplitters  
(mounting optional)

ProFlux® beamsplitter Nanowire® Technology is optimized to operate at 45°, providing durable polarizing beamsplitters. These beamsplitters can be used for a variety of both imaging and non-imaging applications for display products and scientific instruments. The ProFlux polarizing beamsplitter's wide angular aperture, excellent performance and exceptional reliability offer an excellent design choice.

Made with highly durable materials, ProFlux provides pure polarization that gives a high contrast and bright image for the life of the projector. The ProFlux polarization mechanism aligns ideally with the LC display and has excellent polarization uniformity even over large apertures, providing bright, high contrast, long-lasting displays.

## Applications

- Head-Mounted Display (HMD)
- Head-Up Display (HUD)
- 2D & 3D Projection Display
- Interferometry
- Medical/Dental Imaging

## Standard Product Options

Product Name	Description
*PBS02A	Standard PBS, No AR
BCU7GCE1 (PBS02A+OC)	Standard PBS No AR, Protective Overcoat™
PBFF2A	Standard PBF on Flat Fused Silica Substrate, No AR
FBF04C	High Contrast PBS on Flat Borofloat Substrate, With AR
BSU7N2E1	High Transmission PBS No AR (VC4 only)

\*AR coating available on request (PBS02C)  
PBF02A & PBF02C available upon request

See OPT-DATA-1011 for size and mounting options

Features	Benefits
Nanowire® Technology	Brightness and contrast uniformity
	Excellent for optical designs with $f/\# < f/2.0$
	Wavelength and AOI independent
	$\pm 20^\circ$ AOI without depolarization
	Broadband
Inorganic	High heat resistance

## General Specifications

	PBS02A and BCU7GCE1	PBFF2A	FBF04C	BSU7N2E1
<i>Wavelength Range:</i>	420 - 700nm	420 - 700nm	420 - 700nm	420 - 700nm
<i>Substrate Type:</i>	Display Glass	Fused Silica	Borofloat®	Display Glass
<i>Substrate Flatness:</i>	N/A	2µm PV over 90mm diameter	12.35µm PV over 90mm diameter	N/A
<i>Thickness:</i>	0.7 ±0.07mm	1.6 ±0.1mm	1.6 ±0.1mm	0.7 ±0.07mm
<i>Index of Refraction:</i>	435.8nm: 1.598 643.8nm: 1.5078	532nm: 1.461	588nm: 1.472	435.8nm: 1.598 643.8nm: 1.5078
<i>Thermal Expansion:</i>	37.6 x 10 <sup>-7</sup> /°C (0 - 300°C)	6.5 x 10 <sup>-7</sup> /°C (15 - 200°C)	3.25 x 10 <sup>-6</sup> /°C (20 - 300°C)	37.6 x 10 <sup>-7</sup> /°C (0 - 300°C)
<i>AOI (Angle of Incidence):</i>	45° ±15°	45° ±15°	45° ±15°	45° ±15°
<i>AR Coating:</i>	Optional	Optional	Visible	Optional
<i>Maximum Temperature:</i>	200°C > 5,000 hrs	200°C > 5,000 hrs	200°C > 5,000 hrs	200°C > 5,000 hrs
<i>Transmission Axis (TA):</i>	Referenced to long side of part	Referenced to long side of part	Referenced to long side of part	Referenced to long side of part
<i>TA Tolerance:</i>	±1°	±1°	±1°	±1°
<i>Dimensional Tolerance:</i>	±0.2mm	±0.4mm	±0.4mm	±0.2mm
<i>Edge Exclusion:</i>	2mm	2mm	2mm	2mm
<i>RoHS:</i>	Compliant	Compliant	Compliant	Compliant
<i>Visual Criteria:</i>	VC0, VC2, VC4	VC0, VC2, VC4	VC0, VC2, VC4	VC4 only

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



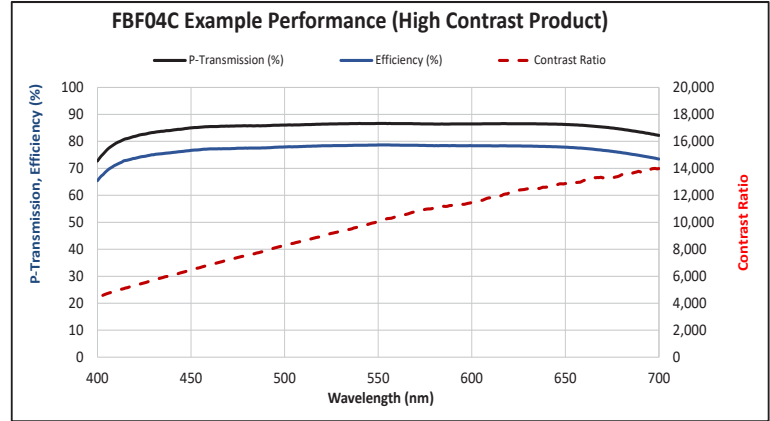
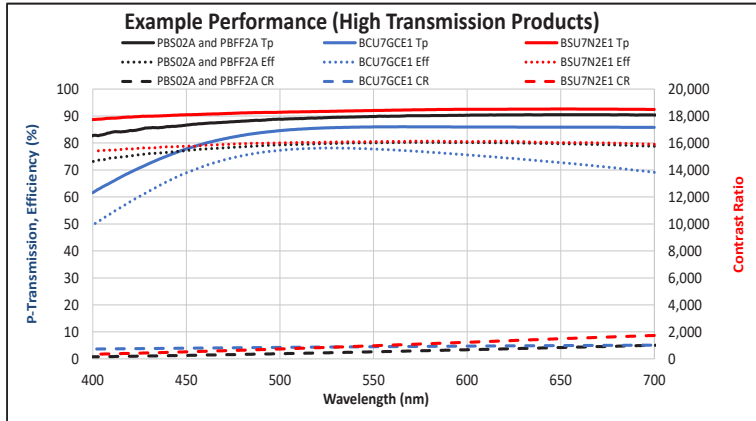
## Performance Specifications at 45°

Product	450nm				550nm				650nm			
	Tp% (min)	Ts% (max)	Eff % (min)	Rp% (max)	Tp% (min)	Ts% (max)	Eff% (min)	Rp% (max)	Tp% (min)	Ts% (max)	Eff% (min)	Rp% (max)
<b>PBS02A* (No AR, Standard)</b>	82.5	0.39	74.0	-	86.8	0.22	75.0	-	86.8	0.15	75.0	-
<b>BCU7GCE1 (No AR, with Overcoat)</b>	72.0	0.50	67.0	-	83.0	0.30	75.0	-	84.0	0.20	70.0	-
<b>PBFF2A (No AR, Standard, Flat F.S.)</b>	83.0	0.25	75.5	3	85.5	0.15	76.7	2	85.5	0.1	77.0	3
<b>FBF04C (With AR, High Contrast, Borofloat)</b>	83.0	0.05	75.5	3	85.5	0.05	76.7	3	85.5	0.05	77.0	3
<b>BSU7N2E1 (No AR, High Transmission)</b>	87.0	0.70	76.0	-	88.0	0.20	77.0	-	88.0	0.15	78.0	-

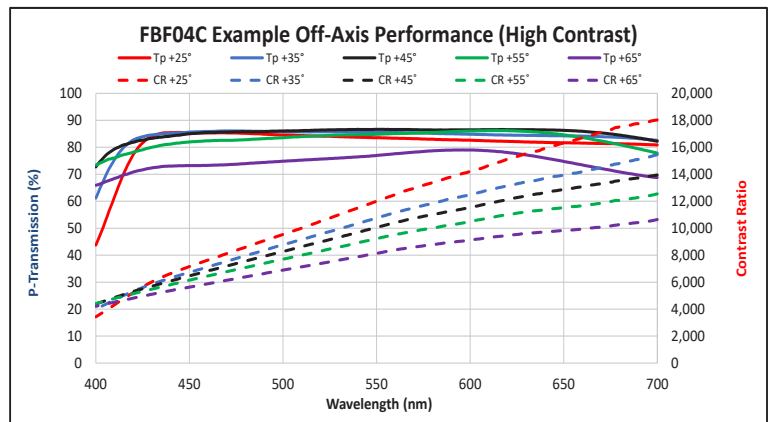
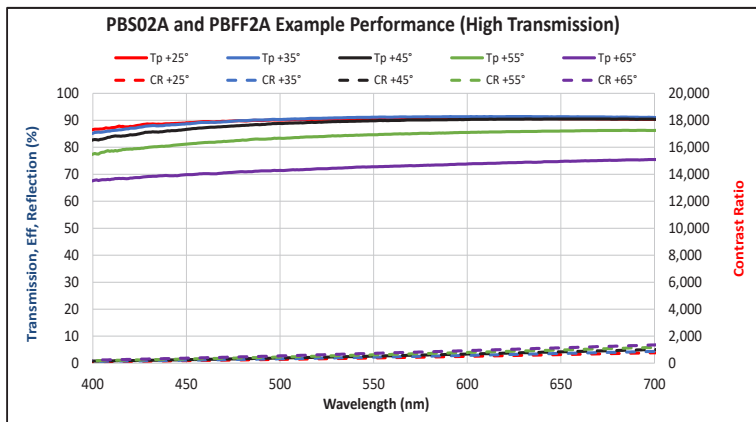
Tp- Transmitted “p” polarization, Ts- Transmitted “s” polarization, Rs- Reflected “s” polarization, Rp- Reflection “p” polarization, Eff= Tp \* Rs /100

\*AR coating available on request (PBS02C)

## Example Optical Performance (Tested at 45°)



## Example Variable Angle Optical Performance



Performance data was taken from sample evaluations. Some part-to-part variation is expected.

## Usage Recommendations

To obtain the best transmission and contrast, the beamsplitter should be used to transmit the p-polarization, using the standard definition of p-polarization and s-polarization. It is possible to use the beam splitter in the orthogonal orientation (transmission of the s-polarization), but with reduced efficiency and contrast. In a projection system it is recommended that the wire-grid surface be positioned to face the imager and projection lens to ensure the reflection is from the front surface of the beamsplitter.

For more detail, please use our Polarizer Comparison Tool at [www.moxtek.com](http://www.moxtek.com)

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



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