THORLABS
43 Sparta Avenue
Newton, NJ 07860 | Sales: (973) 300-3000 | www.thorlabs.com

BPD7254-M01 - October 16, 2023

Item BPD7254-M01 was discontinued on October 16, 2023. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

POLKA DOT BEAMSPLITTERS

- **Constant Reflection to Transmission Ratio Over Range**
- **50:50 Beamsplitters**
- **Metal Coating is Relatively Insensitive to Incident Angle**

BPD254S-G
(1" x 1", B270 Glass Substrate)

BPD5254-G01
(Ø1", CaF_2 Substrate)

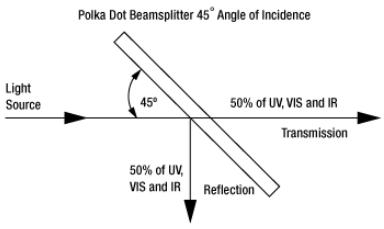
BPD7254-M01
(Ø1", ZnSe Substrate)

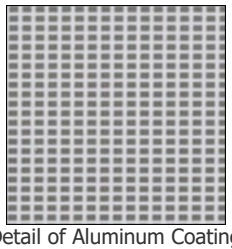
BPD508-FS
(Ø2", UVFS Substrate)

OVERVIEW

Features

- 50:50 Beamsplitting Over Broad Transmission Range
  - UVFS: 250 nm to 2.0 µm
  - B270: 350 nm to 2.0 µm
  - CaF_2: 180 nm to 8.0 µm
  - ZnSe: 2.0 to 11.0 µm
- Four Substrate Options: UV Fused Silica, B270 Glass, Calcium Fluoride (CaF_2), or Zinc Selenide (ZnSe)




Detail of Aluminum Coating Pattern

Thorlabs' 50:50 Polka Dot Beamsplitters offer a nearly constant beamsplitting ratio over their entire specified spectral range. They consist of a vacuum-deposited metal coating on one of four substrates: UV Fused Silica, B270, CaF_2, or ZnSe. Due to their metal coatings, they can be used through a wide range of incident angles with only negligible changes to the reflected and transmitted intensity. To view wavelength- and angle-dependent reflection and transmission data, please click on the graph icons in the tables below.

The metal coating is applied in a regularly repeating array, which lends the beamsplitter its "polka dot" appearance, as shown to the right. Light is reflected by the metal-coated portion of the beamsplitter and transmitted through the uncoated portion of the beamsplitter. To maximize the reflected intensity, light should be incident on the coated side of the beamsplitter. The square dots have 0.0040" (100 µm) [UVFS, B270, and CaF_2] or 0.0042" (107 µm) [ZnSe] sides. The spacing between the dots is 0.0022" (56 µm) [UVFS, B270, and CaF_2] or 0.0018" (46 µm) [ZnSe] in all directions.

Polka dot beamsplitters are typically used at a 45° angle relative to the incident beam as shown in the diagram above. Our polka

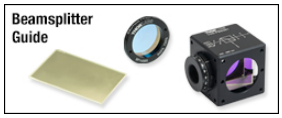
dot beamsplitters transmit 50% ± 5% (±10% for ZnSe) when a beam is larger than 2 mm in diameter.

The Ø1" and Ø2" polka dot beamsplitters can be mounted into any of our Ø1" and Ø2" optic mounts, respectively. The 1" square beamsplitters can be held in a fixed filter mount like our DH1 Compact Dual Filter Holder.

Thorlabs also offers a family of plate beamsplitters with dielectric coatings. For more information on selecting a beamsplitter, please see the *BS Selection Guide* tab.

BS SELECTION GUIDE

Beamsplitter Selection Guide



Thorlabs' portfolio contains many different kinds of beamsplitters, which can split beams by intensity or by polarization. We offer plate and cube beamsplitters, though other form factors exist, including pellicle and birefringent crystal. For an overview of the different types and a comparison of their features and applications, please see our overview. Many of our beamsplitters come in premounted or unmounted variants. Below is a complete listing of our beamsplitter offerings. To explore the available types, wavelength ranges, splitting/extinction ratios, transmission, and available sizes for each beamsplitter category, click *More [+]* in the appropriate row below.

Plate Beamsplitters

Non-Polarizing Plate Beamsplitters	More [+]
Polarizing Plate Beamsplitters	More [+]

a. 45° AOI Unless Otherwise Noted
b. 30 arcmin Wedge on Round Optics Only
c. Designed for use with P-polarized light.

Cube Beamsplitters

Non-Polarizing Cube Beamsplitters	More [+]
Polarizing Cube Beamsplitters	More [+]

Pellicle Beamsplitters

Non-Polarizing Pellicle Beamsplitters	More [+]

Crystal Beamsplitters

Polarizing Crystal Beamsplitters	More [+]

a. Mounted in a protective box, unthreaded ring, or cylinder.
b. Available unmounted or mounted in a protective box or unthreaded cylinder.

Other

Other Beamsplitters	More [+]

UV Fused Silica Polka Dot Beamsplitters: 250 nm - 2.0 µm

These Polka Dot Beamsplitters are made from UV Fused Silica (UVFS) and provide high transmission over the 250 nm - 2.0 µm spectral range. They can be used from 0 to 45° AOI with only negligible changes to the reflected and transmitted intensity. Light should be incident on

Specifications	
Available Sizes	Ø1", Ø2", or 1" Square
Beamsplitting Ratio	50% ± 5%
Minimum Beam Diameter	2 mm

the aluminum-coated side to maximize the reflected intensity.

Transmission and Reflectance Data[a]	
0° and 8° AOI[b]	
45° AOI	

a. Click here for raw data.
b. Transmission is measured at 0° AOI and reflection is measured at 8° AOI.

for 50/50 Split	
Material	UV Fused Silica
Wavelength Range	250 nm - 2.0 µm
Coating Pattern	Square-Coated Apertures 0.0040" (100 µm) Sides, 0.0022" (56 µm) Spacing
Clear Aperture	>90% Diameter (Round Optics) >90% Length and Height (Square Optics)
Thickness	1.5 mm (Nominal)
Dimensional Tolerance	+0.0 / -0.5 mm
Angle of Incidence	0 to 45°

Part Number	Description	Price	Availability
BPD254S-FS	Polka Dot Beamsplitter, 1" x 1", UV Fused Silica	$160.71	Today
BPD254-FS	Polka Dot Beamsplitter, Ø1", UV Fused Silica	$160.71	Today
BPD508-FS	Polka Dot Beamsplitter, Ø2", UV Fused Silica	$573.01	Today

B270 Glass Polka Dot Beamsplitters: 350 nm - 2.0 µm

These Polka Dot Beamsplitters are made from B270 glass and provide high transmission over the 350 nm - 2.0 µm spectral range. They can be used from 0 to 45° AOI with only negligible changes to the reflected and transmitted intensity. Light should be incident on the aluminum-coated side to maximize the reflected intensity.

Transmission and Reflectance Data[a]	
0° and 8° AOI[b]	
45° AOI	

a. Click here for raw data.
b. Transmission is measured at 0° AOI and reflection is measured at 8° AOI.

Specifications	
Available Sizes	Ø1", Ø2", or 1" Square
Beamsplitting Ratio	50% ± 5%
Minimum Beam Diameter for 50/50 Split	2 mm
Material	B270
Wavelength Range	350 nm - 2.0 µm
Coating Pattern	Square-Coated Apertures 0.0040" (100 µm) Sides, 0.0022" (56 µm) Spacing
Clear Aperture	>90% Diameter (Round Optics) >90% Length and Height (Square Optics)
Thickness	1.5 mm (Nominal)
Dimensional Tolerance	+0.0 / -0.5 mm
Angle of Incidence	0 to 45°

Part Number	Description	Price	Availability
BPD254S-G	Polka Dot Beamsplitter, 1" x 1", B270 Glass	$121.12	Today
BPD254-G	Polka Dot Beamsplitter, Ø1", B270 Glass	$121.12	Today
BPD508-G	Polka Dot Beamsplitter, Ø2", B270 Glass	$319.11	Today

CaF_2 Polka Dot Beamsplitters: 180 nm - 8.0 µm

These Polka Dot Beamsplitters are made from Calcium Fluoride (CaF_2) and provide high transmission over the 180 nm - 8.0 µm spectral range. They can be used from 0 to 45° AOI with only negligible changes to the reflected and transmitted intensity. Light should be incident on the aluminum-coated side to maximize the

Specifications	
Available Sizes	Ø1" or Ø2"
Beamsplitting Ratio	50% ± 5%
Minimum Beam Diameter for 50/50 Split	2 mm

reflected intensity.

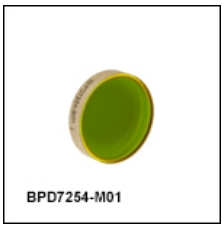
Transmission and Reflectance Data[a]	
0° and 12° AOI[b]	
45° AOI	

a. Click here for raw data.
b. Transmission is measured at 0° AOI and reflection is measured at 12° AOI.

Material	CaF_2
Wavelength Range	0.18 - 8.0 µm
Coating Pattern	Square-Coated Apertures 0.0040" (100 µm) Sides, 0.0022" (56 µm) Spacing
Clear Aperture	>90% Diameter
Surface Flatness	λ/4 at 632.8 nm, Over Clear Aperture
Surface Quality	60-40 Scratch-Dig
Thickness	5 ± 0.3 mm (Ø1" Optics) 8.0 mm (Ø2" Optics)
Diameter Tolerance	+0.0 / -0.2 mm
Angle of Incidence	0 to 45°

Part Number	Description	Price	Availability
BPD5254-G01	**Customer Inspired! Polka Dot Beamsplitter, Ø1", CaF_2 Substrate**	**$398.31**	**Today**
BPD5508-G01	**Customer Inspired! Polka Dot Beamsplitter, Ø2", CaF_2 Substrate**	**$624.24**	**Today**

ZnSe Polka Dot Beamsplitter: 2.0 - 11.0 µm



This Polka Dot Beamsplitter is made from Zinc Selenide (ZnSe) and provides high transmission over the 2.0 - 11.0 µm spectral range. It can be used from 0 to 45° AOI with only negligible changes to the reflected and transmitted intensity. Light should be incident on the gold-coated side to maximize the reflected intensity.

This beamsplitter has a bare gold polka dot pattern on one side and an engraved arrow indicating the direction of transmission on its edge. Please only use compressed air to clean this optic. All other cleaning materials could damage the polka dot pattern.

When handling optics, one should always wear gloves. This is especially true when working with zinc selenide, as it is a hazardous material. For your safety, please follow all proper precautions, including wearing gloves when handling these lenses and thoroughly washing your hands afterward.

Thorlabs will accept all ZnSe lenses back for proper disposal. Please contact Tech Support to make arrangements for this service.

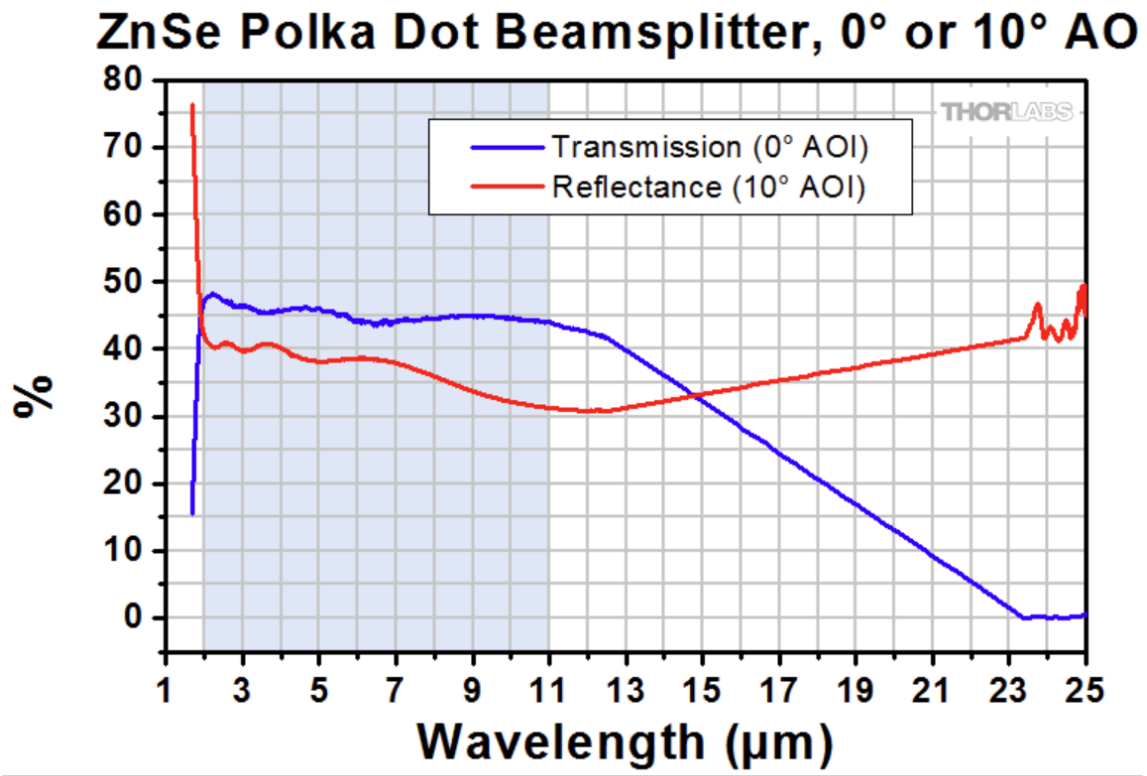
Transmission and Reflectance Data[a]	
0° and 10° AOI[b]	
45° AOI	

a. Click here for raw data.
b. Transmission is measured at 0° AOI and reflection is measured at 10° AOI.

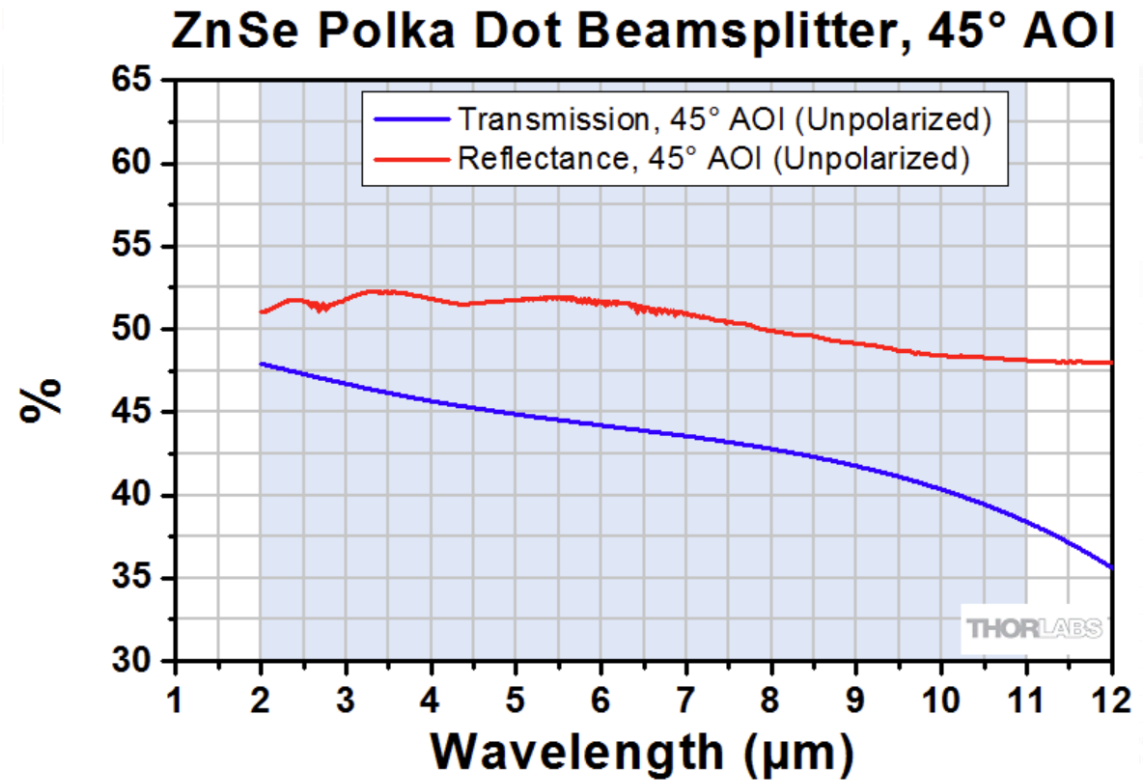
Specifications	
Size	Ø1"
Beamsplitting Ratio	50% ± 10%
Minimum Beam Diameter for 50/50 Split	2 mm
Material	ZnSe
Wavelength Range	2.0 - 11.0 µm
Coating Pattern	Square-Coated Apertures 0.0042" (107 µm) Sides, 0.0018" (46 µm) Spacing
AR Coating (Both Sides)[a]	2 - 11 µm, $R_{avg} \leq 3.5\%$ @ 45° AOI
Clear Aperture	>90% Diameter
Surface Flatness	λ/4 at 632.8 nm, Over Clear Aperture
Surface Quality	60-40 Scratch-Dig
Thickness	5.0 mm
Angle of Incidence	0 to 45°

a. Both sides of this beamsplitter are AR coated. The reflected beam contains contributions from the non-gold-coated parts of the substrate.

Part Number	Description	Price	Availability
BPD7254-M01	**Customer Inspired! Polka Dot Beamsplitter, Ø1", ZnSe Substrate**	**$630.00**	**Lead Time**



The blue shaded region indicates the specified wavelength range for optimum performance.



The blue shaded region indicates the specified wavelength range for optimum performance.