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THORLABS

AC254-200-F - February 16, 2023

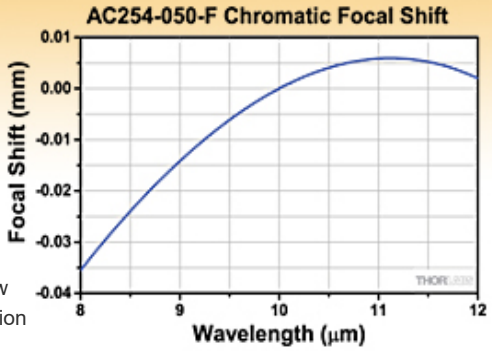
Item # AC254-200-F was discontinued on February 16, 2023. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

LWIR ACHROMATIC DOUBLETS OPTIMIZED FOR 8 - 12 mm

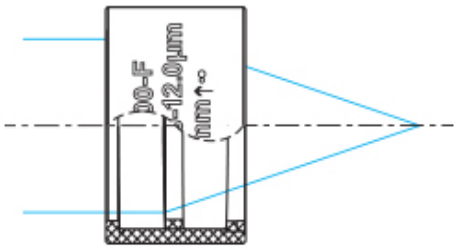
- **AR Coating for 8 - 12 µm**
- **Design Wavelengths at 8 µm, 10 µm, and 12 µm**
- **1" Outer Diameter**

AC254-075-F
f = 75 mm

AC254-050-F
f = 50 mm



Each mount includes an engraved arrow indicating the direction of light propagation required to collimate a point source.

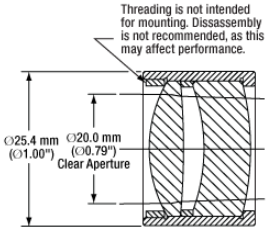


Hide Overview

OVERVIEW

Features

- Air-Spaced Doublet Design Provides Superior Aberration Performance than Singlet Lenses
- AR Coated for the 8 - 12 µm Range
- Designs Incorporate Zinc Selenide (ZnSe) and Zinc Sulfide (ZnS) Substrates
- Engraved Ø1" Mount for SM1 Compatiblity



Click to Enlarge

General Specifications	
Diameter	Ø1" (Ø25.4 mm)
Dimension Tolerance	+0.00/-0.10
Centration	<3 arcmin
Clear Aperture	Ø20 mm
Spot Size	Diffraction Limited On Axis
Design Wavelengths	8 µm, 10 µm, and 12 µm
Antireflection Coating	R_{avg} < 1.5% from 8 to 12 µm, 0° AOI
Substrates	Zinc Selenide[a] and Zinc Sulfide
Focal Length Tolerance	±1% at 10 µm
RMS WFE	<λ/10 @ 10 µm
Surface Quality	60-40 Scratch-Dig

a. Click Link for Detailed Specifications on the Substrate

These AR-coated, air-spaced achromatic doublet lenses provide excellent transmission in the 8 - 12 µm range (surface reflectance for each coating can be seen in the graph to the right). They incorporate two AR-coated lenses, one with a zinc selenide substrate and another with a zinc sulfide substrate. Each achromatic doublet on this page has three design wavelengths: 8 µm, 10 µm, and 12 µm. By optimizing the design for these three wavelengths, the focal shift across the 8 - 12 µm range will be minimized (see the graphs below for details), providing excellent on-axis performance.

Thorlabs' LWIR achromatic doublets are pre-mounted in engraved Ø1" outer diameter mounts, making it easy to incorporate these optics into your setup. Each engraving includes the part number, AR coating range, focal length, an arrow indicating the direction of light propagation to collimate a point source, and an infinity symbol denoting that this lens has an infinite conjugate ratio (i.e., if a diverging light source is placed one focal length away from the flat side of the

lens, the light rays emerging from the curved side will be collimated).

Note: We do not recommend disassembly of these lenses, as this may affect performance.

Zemax Files
Click on the red Document icon next to the item numbers below to access the Zemax file download.

Air-Spaced Doublets Selection Guide	
UV (245 - 400 nm)	D (1.65 - 3 µm)
Visible (350 - 700 nm)	E (3 - 5 µm)
NIR (650 - 1050 nm)	F (8 - 12 µm)
Laser-Line (532 & 1064 nm)	

Note: The optical coating on these lenses contains thorium tetrafluoride (ThF_4) due to its superior performance in the IR. This is a radioactive material, and thus, these lenses should be handled with care. Additionally, ZnSe is a hazardous material. For your safety, please follow all proper precautions while handling any ZnSe products, including wearing gloves and thoroughly washing your hands afterward.

Hide 8 - 12 µm Air-Spaced Achromatic Doublets

8 - 12 µm Air-Spaced Achromatic Doublets

Item #	f (mm)	L (mm)	WD (mm)	Reference Drawing	Reflectance Plot	Left Lens Material[a]	Right Lens Material[a]	Graphs[b]
AC254-050-F	50	15.0	37.2			Zinc Selenide	Zinc Sulfide	
AC254-075-F	75	12.1	65.1					
AC254-100-F	100	11.5	90.5					
AC254-200-F	200	10.0	194.3					

a. "Left" and "Right" refer to the orientations of the lenses in the drawing found in the Reference Drawing column.

b. Click on for plots and downloadable data of the focal length shift and transmission for the lens.

Part Number	Description	Price	Availability
AC254-050-F	**ZnSe-ZnS Air-Spaced Achromatic Doublet, ARC: 8-12 µm, f=50 mm**	**$950.34**	**Today**
AC254-075-F	**ZnSe-ZnS Air-Spaced Achromatic Doublet, ARC: 8-12 µm, f=75 mm**	**$950.34**	**Today**
AC254-100-F	**ZnSe-ZnS Air-Spaced Achromatic Doublet, ARC: 8-12 µm, f=100 mm**	**$950.34**	**Today**
AC254-200-F	**ZnSe-ZnS Air-Spaced Achromatic Doublet, ARC: 8-12 µm, f=200 mm**	**$950.34**	**Today**