

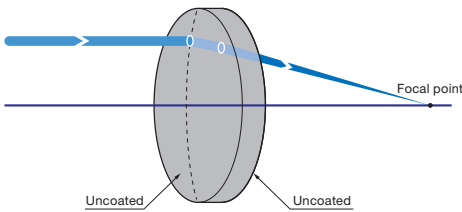


The single crystal of germanium used in semiconductor is less absorption in the infrared wavelength of 2 - 20 μ m and it can be used as an optical element of the infrared light. It is a single lens which was made with the germanium crystal. It is used as a lens of a camera to observe the infrared, such as thermography.

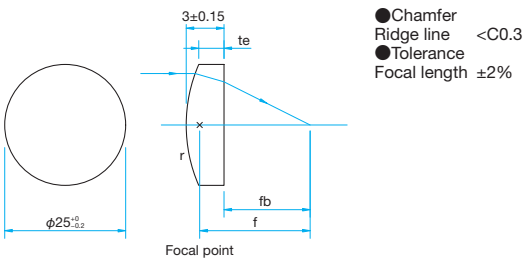
- Even though it looks like the light does not transmit because of its metallic luster, it is transmitting through a wide infrared range of 2 - 20 μ m.
- The wavelength of 1.5 μ m or less does not transmit, so it also provides the effect of an infrared transmission filter.
- Since the silicon lens has a refractive index of 4 or more, the lens curvature is slower then when made from standard glass.



Schematic



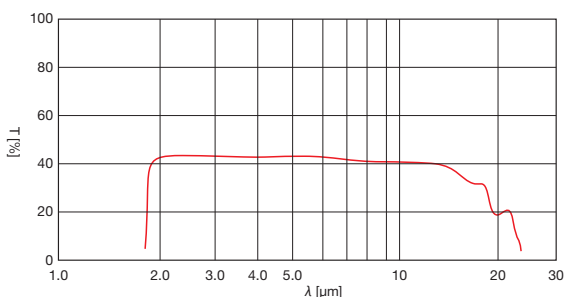
Outline Drawing (in mm)



Specifications

Part Number	Focal length f [mm]	Back focal length fb [mm]	Edge thickness te [mm]
SLGE-25-25P	25	24.25	1.95
SLGE-25-50P	50	49.25	2.48
SLGE-25-100P	100	99.25	2.74

Typical Transmittance Data T: Transmission



Specifications

Material	Germanium (Ge)
Design Wavelength	10.6 μ m
Coating	Uncoated
Surface Reflectance	36% (per side)
Shape	Spherical Plano Convex Polished Both Surfaces
Centration	<3'
Clear Aperture	90% of diameter
Surface Quality (Scratch-Dig)	60-40

Guide

► It is available with an AR coating to reduce the transmission loss by reflection at the requested wavelength.

Attention

- Germanium lens can have metallic luster, so that visible light is reflected and absorbed. Because of this, no transmittance occurs.
- Germanium lens without an anti-reflection coating has a loss due to surface reflection and results in transmittance of about 40%.
- For the observation of infrared wavelengths, it is necessary to consider the effect of the radiation spectrum by temperature. In case of using in an environment of 30°C or more, radiant light of infrared (near 9.6 μ m) is emitted from all substances, and it will not be able to properly observe this infrared spectrum.

Physics

Wavelength [nm]	Refractive Index	Remarks column
1064	4.4100	YAG laser
1320	4.3050	communication LD
1550	4.2300	communication LD
2000	4.1200	
3000	4.0443	
4000	4.0250	
5000	4.0162	
6000	4.0115	
7000	4.0086	
8000	4.0067	
9000	4.0054	
9400	4.0049	CO ₂ laser
10600	4.0035	CO ₂ laser
12000	4.0029	
13000	4.0022	
14000	4.0018	
15000	4.0013	
16000	4.0009	
17000	4.0004	
18000	4.0000	
19000	3.9996	
20000	3.9992	
Density	5.33g/cm ³	
Thermal Conductivity	58.6W·m ⁻¹ K ⁻¹ (20°C)	
Thermal Expansion Coefficient	5.5×10 ⁻⁶ /°C (25°C)	

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