



Silicon (Si) Windows



Features:

- Transmits wavelength range: 1.2-7 μm
- Ideal for weight sensitive applications
- Cheaper than germanium and ZnSe

Descriptions:

Silicon (Si) Windows manufactured from optical grade silicon are popular for the 1.2 - 7 μm spectral region due to their low cost and low density. Due to its low density (half that of germanium or zinc Selenide), silicon is ideal for weight sensitive applications, especially those in the MWIR thermal imaging 3 - 5 μm region. Density is 2.329 g/cm³ and Knoop Hardness is 1150, making it harder and less brittle than germanium.

Specifications:

Materials	Silicon crystals	Diameter Range	~ 300mm
Aperture	>90%	Dimension Tolerance	+0.0/-0.2mm
Thickness Tolerance	+/-0.1mm	Surface Quality	60/40 S/D
Parallelism	1 arc minute	Chamfer	0.3-0.5mmx45degree
Coating	AR/AR or DLC/AR		

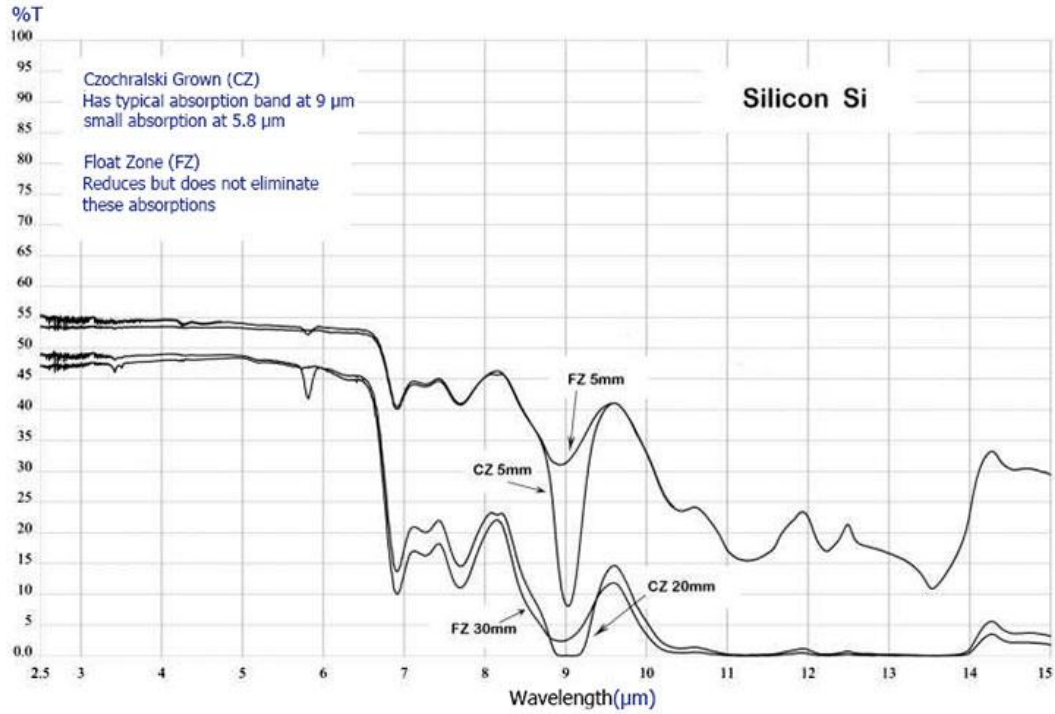
Basic Properties:

Transmission Range	1.2 to 15 μm (1)	Refractive Index	3.4223 @ 5 μm (1) (2)
Reflection Loss	46.2% at 5 μm (2 surfaces)	Absorption Coefficient	0.01 cm ⁻¹ at 3 μm
Reststrahlen Peak	n/a	dn/dT	160 x 10 ⁻⁶ /°C (3)
dn/d μ = 0	10.4 μm	Density	2.33 g/cc
Melting Point	1420 °C	Thermal Conductivity	163.3 W m ⁻¹ K ⁻¹ at 273 K
Thermal Expansion	2.6 x 10 ⁻⁶ / at 20°C	Hardness	Knoop 1150
Specific Heat Capacity	703 J Kg ⁻¹ K ⁻¹	Dielectric Constant	13 at 10 GHz
Youngs Modulus (E)	131 GPa (4)	Shear Modulus (G)	79.9 GPa (4)
Bulk Modulus (K)	102 GPa	Elastic Coefficients	C11=167; C12=65; C44=80 (4)
Apparent Elastic Limit	124.1MPa (18000 psi)	Poisson Ratio	0.266 (4)
Solubility	Insoluble in Water	Molecular Weight	28.09
Class/Structure	Cubic diamond, Fd3m		

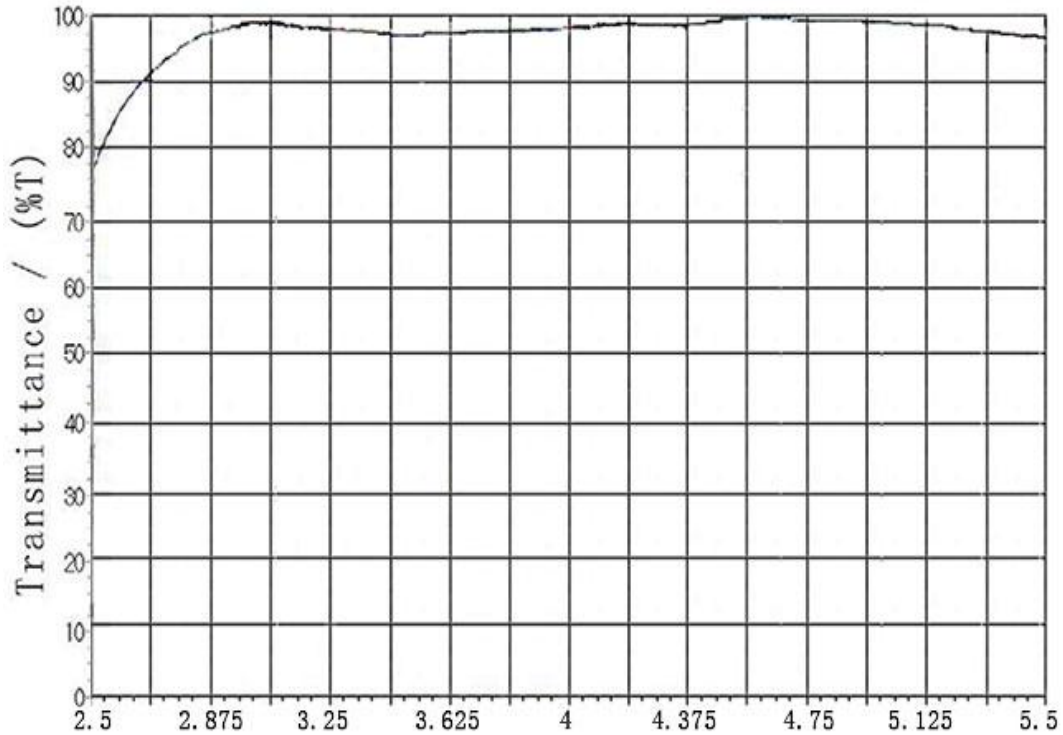


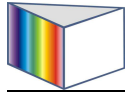
Technical images:

1. Transmission curve of the Silicon windows (no coating)



2. Transmission curve of the Silicon windows with AR/AR coating at 3-5μm





Related products:

- 1) Infrared windows -> Ge windows
- 2) Infrared windows -> ZnSe windows
- 3) Infrared windows -> Sapphire windows