

# Global Source for IR Optics and Materials



## Silicon (Si)

Vital Materials is dedicated to providing high quality infrared materials for infrared and laser applications worldwide, which makes us the right choice for your infrared material needs. Besides Zinc Selenide, Germanium and Zinc Sulfide, our products also include Silicon wafers and lens blanks, etc. As the most common material with good durability, thermal stability and low density, Silicon is widely used in detector / sensor devices, MEMS fabrication, opto-electronic components, integrated circuits and solar cells.

We specialize in supplying a number of forms and sizes to meet our customers' requirements at a reasonable price. By doping with Boron (P-type) and Phosphorus (N-type), we made our Silicon products ideal for optical use because of its resistivity and broad transmission range.

## Specification

Physical Properties	
Density, g/cm <sup>3</sup>	2.33g/cm <sup>3</sup>
Knoop Hardness, kg/mm <sup>2</sup>	1100
Young's Modulus, (Gpa)	130.91
Thermal Conductivity, 313K, (W/m · K)	163
Thermal Expansion, 293 K, (/K)	2.6x10 <sup>-6</sup>
Specific Heat Capacity, (J/g° C)	712.8
Dielectric Constant, 9.37 x 10 <sup>9</sup> Hz	13
Melting Point, (° C)	1414
Bandgap, (eV)	1.1
Shear Modulus, (Gpa)	79.92
Bulk Modulus, (Gpa)	101.97
Debye Temperature, (K)	640
Poisson's Ratio	0.28

Optical Properties	
Transmission Range	1.2~8 μm
Reflection Loss, two surfaces at 5 μm	46.2%

Wavelength, μ m	Refractive Index
2	3.4516
3	3.4321
4	3.4257
5	3.4223
6	3.4202
7	3.4189
8	3.4184
9	3.4181
10	3.4179
11	3.4176

## Vital Materials Co., Limited

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