



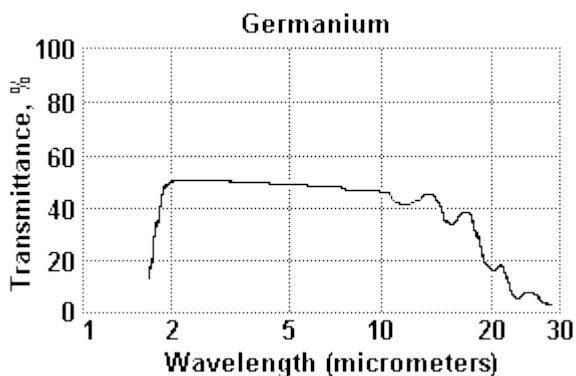
吉林省武圆光电科技有限公司
VY Optoelectronics Co.,Ltd.

VY Optics is a manufacturer of Germanium windows and Germanium lenses for Thermal Imaging Applications and Infrared Spectroscopy, custom Germanium optics.

We produce:

1. Germanium windows up to 250 mm diameter;
2. Germanium plano convex and meniscus lenses with any focal length;
3. Custom Germanium Optics with DLC or BBAR coating 2-14 μ m, 8-12 μ m;

Transmission curve of Germanium, thickness is 10mm



Germanium is used widely for lenses and windows in thermal imaging, FLIR applications, as germanium viewports. Its high index of refraction (about 4) makes it of particular interest. Useful transmission range of Germanium windows is from 2 to 13 μ m. Germanium is opaque in the visible. Germanium has the property of thermal runaway, meaning that the transmission decreases as temperature increases. Germanium window should be used at temperatures below 100°C.

The Knoop Hardness of Germanium (780) is approximately twice that of Magnesium Fluoride, making it ideal for IR applications requiring rugged optics. Germanium's high density (5.33 g/cm³) should be considered when designing for weight-sensitive systems.

Custom germanium windows and germanium lenses are available in any size and configuration. Anti-reflection coatings can be applied for 2-14 μ m or 8-12 μ m (BBAR coating or DLC/BBAR) depending on your custom application.



Germanium properties

Chemical Formula	Ge
Crystal Form	Monocrystal
Crystal Class	Cubic
Resistivity, Ohm*cm	5-40
Lattice Constant, E	5.66
Molecular Weight	72.60
Density, g/cm ³ at 300 K	5.33
Dielectric Constant for 9.37 x 10 ⁹ Hz at 300 K	16.6
Melting Temperature, K	1210
Thermal Conductivity, W/(m K) at 293 K	59
Thermal Expansion, 1/K at 298 K	6.1 x 10 ⁻⁶
Specific Heat, cal/(g K) at 273-373 K	0.074
Debye Temperature, K	370
Bandgap, eV	0.67
Solubility in water	None
Knoop Hardness, kg/mm ²	800
Mohs Hardness	6.3
Young's Modulus, GPa	102.66
Shear Modulus, GPa	67.04
Bulk Modulus, GPa	77.86
Poisson's Ratio	0.278