

Germanium Data Sheet

Physical Properties	
Density, 298K, (g/cm ³)	5.33
Hardness, (kg/cm ²)	800
Young's Modulus, 298K, (Gpa)	
<100>	103.3
<110>	138
<111>	155.5
Thermal Conductivity, 300K, (Wm ⁻¹ K ⁻¹)	59.9
Thermal Expansion Coefficient, 300K, (/k)	6.0 x 10 ⁻⁶
Specific Heat Capacity, 298K, (J/kg · K)	322
Dielectric Constant	16
Melting Point, (°C)	937.4
Crystal Structure	Monocrystalline / Polycrystalline
Purity	> 99.999%
Conductivity Type	n
Resistivity	0.03–50 Ω · cm
Poisson's Ratio, 125 ~ 375K	0.278
Modulus of Rupture, (Mpa)	72.4
Surface Finish	Ra _{max} 0.2 μm to 4.0 μm (D7 to D46)

Wavelength, μm	Refractive Index
2.5	4.0654
3	4.0447
4	4.0254
5	4.0171
6	4.0121
7	4.0093
8	4.0073
9	4.0062
10	4.0052
11	4.0044
12	4.0038
13	4.0036
14	4.0033
15	4.0028

Optical Properties	
Transmission Spectrum, (μm)	2 ~ 14
Temperature Coefficient of Refractive Index, (/K)	400 x 10 ⁻⁶
Refractive Index, (10 μm)	4.0052
Refractive Index Homogeneity	≤ 1.0 + 10 ⁻⁴
Absorption Coefficient, 10.6 μm, (/cm)	≤ 0.035
Optical Transmittance, 10.6 μm	≥ 45.0%

Formats/ Sizes/ Tolerances	
Monocrystalline and Polycrystalline Ge Circular Disks and Wafers	
	Unit: mm
Diameter	3–310 (Single Crystal) 3–400 (Polycrystal)
Diameter Tolerance	≤ 0.05
Minimum Thickness	0.5
Maximum Thickness	60
Thickness Tolerance	≤ 0.05

Monocrystalline and Polycrystalline Ge Rectangular Sheets	
	Unit: mm
Maximum Size	205 x 205
Tolerance	0.1
Minimum Thickness	Upon edge length
Thickness Tolerance	Standard 0.1 (Thickness ≤ 100mm)

Germanium Lenses	
	Unit: mm
Diameter	7 – 260
Diameter Tolerance	Standard: 0.1
The Radius of Curvature Tolerance	Standard: 0.2%
Center Thickness Tolerance	Standard: 0.1
Edge Thickness Variation (ETV)	≤ 0.05