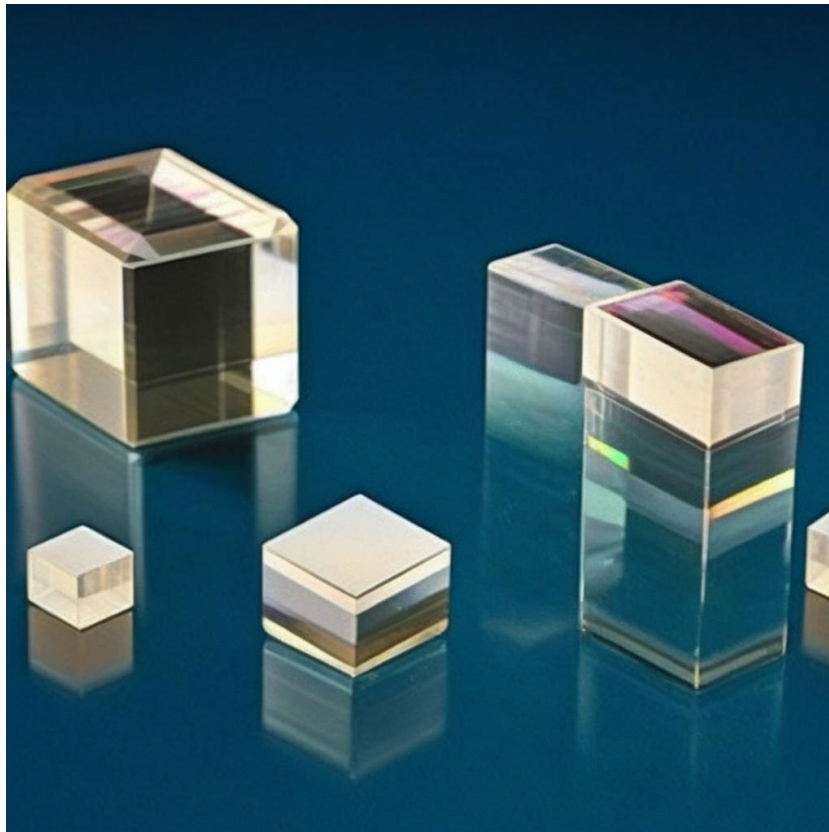


POC-OC-122416-AgGaGeS4 Crystal Datasheet

1. Main Features

- Wide transmission range: 0.5 – 11.5 μm .
- Low absorption coefficient: $<0.05 \text{ cm}^{-1}$ at 1064 nm.
- High nonlinear coefficient: $d_{31} = 15 \text{ pm/V}$.
- High laser damage threshold: $>1.2 \text{ J/cm}^2$ at 1064 nm.
- Ideal for high-power mid-IR tunable laser applications.



2. Material General Description

AgGaGeS4 Crystal is a cutting-edge mid-IR nonlinear optical crystal with excellent transmission properties, low absorption coefficients, and a high laser damage threshold. Its wide transparency range (0.5–11.5 μm) and nonlinear optical coefficients make it a superior alternative to traditional crystals in mid-IR laser systems. The material is particularly suitable for Nd:YAG laser-pumped systems and high-power mid-IR parametric oscillators. AgGaGeS4 crystals are available in annealed and as-grown forms, optimized for specific applications in infrared optics.

3. General Applications and Examples

- Mid-Infrared Optical Systems:** AgGaGeS4 is utilized in mid-IR tunable laser systems for applications like spectroscopy, medical diagnostics, and material processing. Its wide transparency range enables high-efficiency frequency conversion in mid-IR regions.
- High-Power Lasers:** With a high nonlinear coefficient and laser damage threshold, AgGaGeS4 supports high-power systems, including parametric oscillators and amplifiers.
- Laser Pumped Systems:** The crystal is optimized for 1.06 μm Nd:YAG laser-pumped applications and can also be pumped with 0.8 μm Ti:Sapphire lasers, delivering efficient mid-IR outputs.
- Spectroscopy and Remote Sensing:** The broad transparency range and low absorption coefficients make AgGaGeS4 a reliable choice for infrared spectroscopy, allowing precise chemical analysis and environmental monitoring.
- Industrial Applications:** Common in laser cutting, welding, and mid-IR imaging systems, AgGaGeS4 ensures durability and efficiency in harsh industrial environments.

4. Chemical and Structural Properties

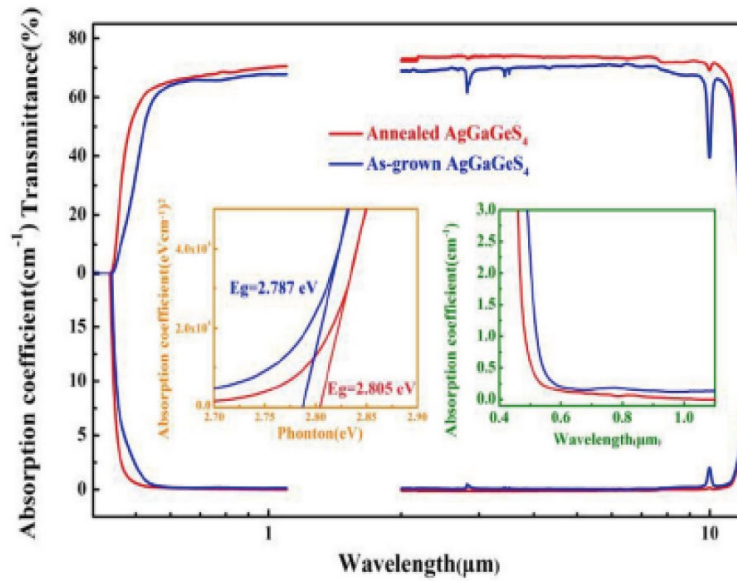
Property	Value
Chemical Formula	AgGaGeS4
Crystal Structure	Orthorhombic
Lattice Parameters	a = 1.05 nm, b = 0.76 nm
Density	4.5 g/cm ³
Mohs Hardness	3
Melting Point	830 °C
Thermal Expansion Coefficients	$\alpha_a = 7.8 \times 10^{-6}/\text{K}$, $\alpha_b = 8.1 \times 10^{-6}/\text{K}$

5. Optical and Nonlinear Optical Properties

Property	Value
Transparency Range	0.5 – 11.5 μm
Absorption Coefficient	$<0.05 \text{ cm}^{-1}$ at 1064 nm
Nonlinear Coefficient (d31)	15 pm/V
Refractive Indices	$n_o = 2.56$, $n_e = 2.73$
Damage Threshold	$>1.2 \text{ J/cm}^2$ at 1064 nm

6. Spectrum Transmission Curves

(Spectrum transmission curves for AgGaGeS₄ Crystal can be provided upon request, showcasing its transmission efficiency across the 0.5–11.5 μm range.)



7. Coating Specification

- **Anti-Reflective (AR) Coating:** Optimized for mid-IR wavelengths with a low reflectance of <0.2%.
- **Customized Coatings:** Other coatings (e.g., BBAR, HR) are available upon request based on specific application needs.

8. Standard Fabrication Specifications

Specification	Value
Dimension Tolerance (mm)	±0.1
Surface Flatness	λ/8 @ 633 nm
Surface Quality (Scratch/Dig)	20/10 to MIL-PRF-13830B
Parallelism	<20 arc seconds
Perpendicularity	≤15 arc minutes
Clear Aperture	≥90% of the diameter
Coatings	AR coatings available
Laser Damage Threshold	>1.2 J/cm ² at 1064 nm

9. POC Strength and Capabilities

<https://www.poc.com.sg> Photonics on Crystals, A brand of *Shapeoptics Holdings*

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Photonics On Crystals (POC) specializes in providing high-quality AgGaGeS₄ crystals for industrial and scientific applications. Our expertise ensures precision growth, superior optical quality, and custom fabrication tailored to client specifications. Our crystals undergo rigorous testing for durability and performance, guaranteeing their reliability in high-power laser systems.

10. Standard Products

Product Code	Dimensions (mm)	Coating Type	Application	Price (USD)
AGGS-1010-AR	10 × 10 × 2	AR Coating	Mid-IR Laser Systems	Request
AGGS-2020-AR	20 × 20 × 5	AR Coating	Spectroscopy Applications	Request
Custom	Custom Sizes	Customized	Tailored for Specific Needs	Request