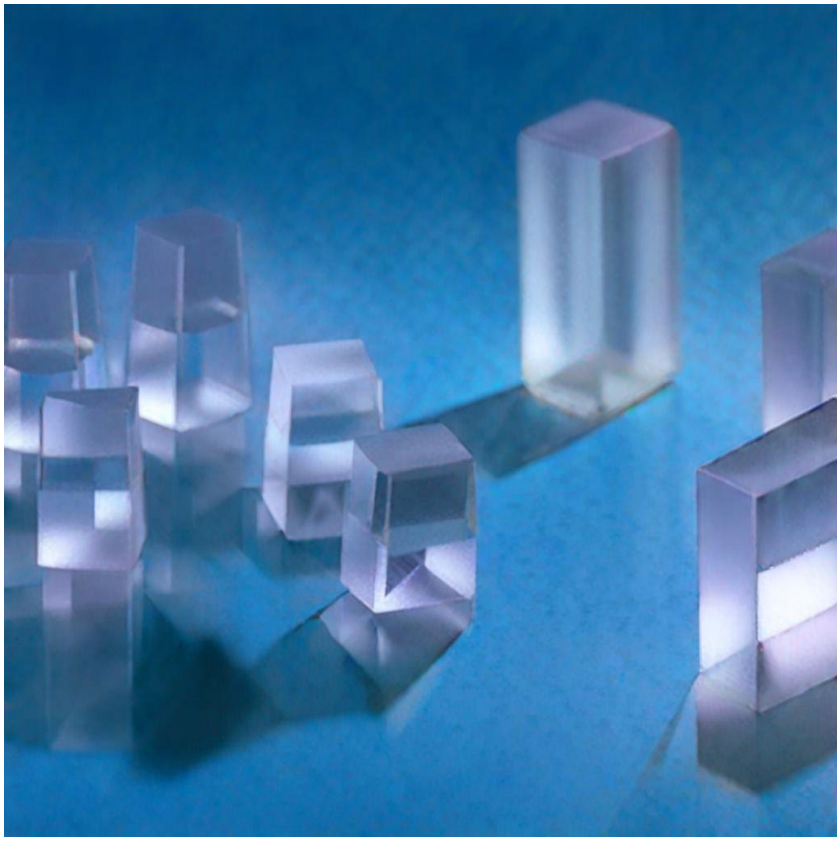
Photonics On Crystals

POC-OC-122484-YAg crystal Datasheet

1 Main Features

- Wide transparency range suitable for mid-infrared applications.
- High optical gain and excellent nonlinearity properties for efficient laser systems.
- Superior thermal and mechanical stability for high-power laser operations.
- Ideal for nonlinear optical applications such as OPOs and frequency conversion.
- Customizable sizes, orientations, and coatings for various photonics needs.



---

2. Material General Description

Yttrium Silver (YAg) crystal is a high-performance material widely used in photonics and laser technology. With its exceptional optical, thermal, and mechanical properties, YAg crystal demonstrates excellent transmission in the mid-infrared region, making it a preferred choice for advanced laser systems. YAg is particularly suited for nonlinear optical applications, including optical parametric oscillators (OPOs) and frequency conversion devices, owing to its high optical gain and nonlinear coefficients. The material's strong thermal stability and low absorption losses under high-power laser conditions enhance its reliability and durability, making it a versatile solution for industrial, scientific, and medical applications.

---

3. General Applications and Examples

1. **Mid-Infrared Laser Systems:**
   YAg crystals serve as an efficient gain medium for mid-infrared lasers used in precision material processing, enabling accurate cutting, drilling, and welding.
2. **Optical Parametric Oscillators (OPOs):**
   The nonlinear properties of YAg make it ideal for use in OPO systems, enabling tunable laser output in the mid-IR spectrum for scientific and industrial applications.
3. **Frequency Conversion Devices:**
   YAg crystals are key in frequency doubling and mixing processes, enabling the generation of coherent radiation at specific wavelengths for spectroscopy and remote sensing.
4. **Medical Laser Applications:**
   The wide transparency range of YAg crystals supports medical laser systems for surgical procedures and dermatological treatments, providing precise wavelength tuning for targeted applications.
5. **Scientific and Defense Applications:**
   YAg crystals are utilized in scientific research and defense systems, such as mid-infrared imaging, laser range finders, and target designators, where efficient wavelength generation is critical.

---

4. Chemical, Physical, or Structural Properties

Property	Value
Chemical Formula	YAg
Density	6.7 g/cm³
Melting Point	~1400°C
Thermal Conductivity	~25 $W \cdot m^{-1} \cdot K^{-1}$
Refractive Index	~2.0–2.2
Nonlinear Coefficient	High
Orientation	Customizable (<111>, <110>, etc.)
Cleavage Plane	<111>

---

5. Optical, Laser, or Nonlinear Optical Properties

Property	Value
Transparency Range	0.5–12 µm
Nonlinear Coefficient	High

Absorption Coefficient	Low
Emission Wavelength Range	2.5–4.5 µm
Laser Damage Threshold	>600 MW/cm²
Refractive Index	2.0–2.2

---

6. Spectrum Transmission Curves

YAg crystals exhibit excellent transmission in the mid-infrared range, with minimal absorption losses. The transmission spectrum illustrates its broad transparency range and suitability for high-power laser operations. Detailed spectral data is available upon request.

---

7. Coating Specification

- **Anti-Reflection Coating:** AR coatings optimized for 2.5–5 µm range with reflectance <0.3%.
- **Durable Coatings:** Coatings engineered for long-term performance under high-power laser applications.
- **Custom Coatings:** Available based on specific application needs, such as high-reflectivity or protective coatings.

---

8. Standard Fabrication Specifications

Specification	**Value**
Dimensional Tolerance	±0.05 mm
Surface Quality	40-20 (scratch-dig rating)
Surface Flatness	λ/8 @ 632.8 nm
Parallelism	<30 arcsec
Bevel	<0.25 × 45°
Diameter Range	Up to 100 mm
Thickness Range	1–10 mm

---

9. POC Strength and Capabilities

Photonics On Crystals (POC) specializes in advanced YAg crystal solutions for photonics and laser applications. POC employs cutting-edge technology and rigorous quality control processes to deliver high-performance products tailored to industrial, medical, and scientific needs. With a focus on

customizability and precision, POC ensures that its YAg crystals meet the demanding requirements of modern photonics systems.

---

10. Standard Products

Product	**Dimensions**	**Price (USD)**
YAg Laser Rods	10–50 mm length	$2,500–$8,000
YAg Optical Windows	20–100 mm diameter	$3,000–$12,000
YAg Nonlinear Mediums	Custom dimensions	$5,000–$20,000
Customization Options	Available on request	Contact for quote