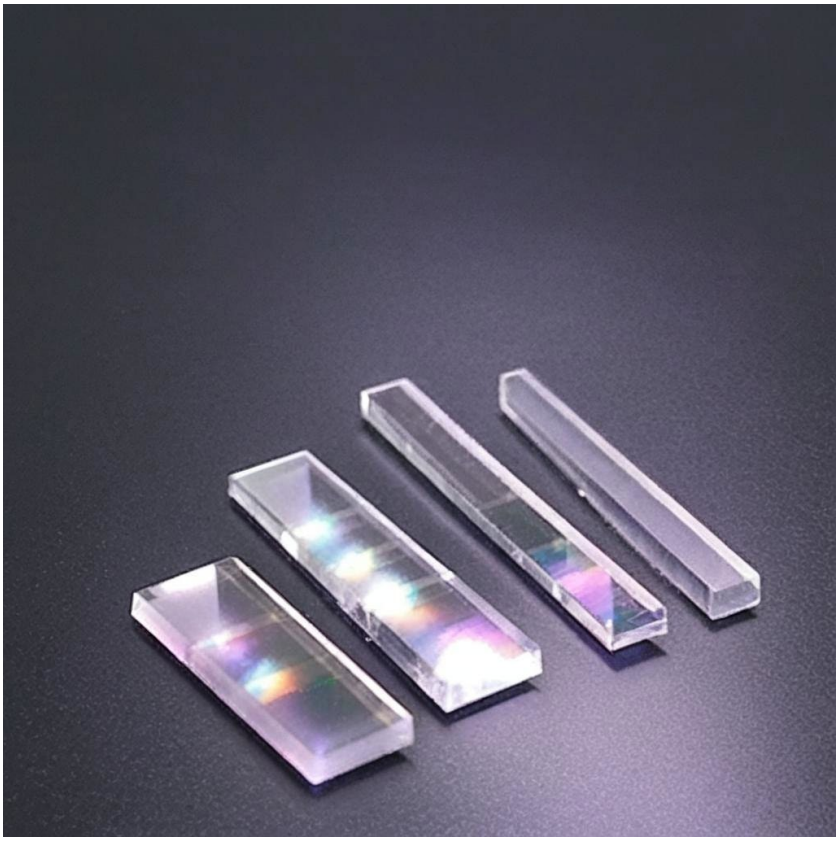
Photonics On Crystals

POC-OC-122449-Er,Yb:Glass Datasheet

1 Main Features

- Highly efficient laser performance with strong absorption and emission characteristics.
- Broad lasing wavelength of 1535 nm, ideal for telecom and laser range-finding applications.
- Low thermal expansion coefficient ensures high operational stability.
- High chemical durability and resistance in aqueous environments.
- Customizable doping concentrations and fabrication specifications to meet specific requirements.



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2. Material General Description

Er:Yb:Glass is a co-doped phosphate-based laser glass designed for applications requiring efficient laser operation at a wavelength of 1535 nm. The material combines the properties of Erbium (Er^{3+}) and Ytterbium (Yb^{3+}) ions to achieve a strong pump absorption and efficient energy transfer. Er:Yb:Glass is widely used in fiber optic communications, range finding, and other laser-based applications due to its high thermal and chemical durability.

The presence of Yb^{3+} ions facilitates energy transfer to Er^{3+}, improving pump utilization efficiency and enabling compact and reliable laser systems. The material also offers excellent optical properties such as low scattering losses and minimal thermal distortion.

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3. General Applications and Examples

Er:Yb:Glass is highly versatile and finds applications in diverse fields:

1. **Telecommunications**: Used in fiber optic amplifiers and transmitters for high-speed, long-distance data transfer at eye-safe wavelengths.
2. **Range Finders**: Employed in military and industrial laser range-finding systems due to its precise and efficient performance.
3. **LIDAR Systems**: Facilitates accurate measurement and 3D imaging in environmental monitoring and autonomous vehicle technology.
4. **Medical Lasers**: Applied in dermatology, ophthalmology, and surgery for its eye-safe wavelength and non-invasive precision.
5. **Scientific Research**: Ideal for high-power laser systems in spectroscopy and other analytical technologies.

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4. Chemical, Physical, and Structural Properties

Parameter	Unit	Er,Yb:Glass	Er,Yb,Cr:Glass
Transition Temperature	°C	566	455
Softening Temperature	°C	605	493
Linear Thermal Expansion	10^-7/°C	87	103
Thermal Conductivity	W/m·K	0.7	0.7
Chemical Durability	µg/hr·cm²	52	103
Density	g/cm³	3.06	3.1
Laser Wavelength Peak	nm	1535	1535
Emission Cross Section	10^-20 cm²	0.8	0.8
Fluorescence Lifetime	ms	7.7-8.0	7.7-8.0
Refractive Index @ 1535nm	-	1.532	1.539
Thermal Optical Coefficient	10^-6/°C	-1.72	-5.2

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5. Optical, Laser, and Nonlinear Optical Properties

Parameter	Value

Peak Emission Wavelength	1535 nm
Absorption Cross Section	0.8 × 10^-20 cm^2
Fluorescence Lifetime	7.7–8.0 ms
Refractive Index @ 1535nm	1.532
Thermal Expansion Coefficient	87 × 10^-7/°C

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6. Spectrum Transmission Curves

Detailed spectrum transmission data is available upon request. The material demonstrates strong absorption in the pump wavelength range of 1535 nm and low losses across the operational spectrum.

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7. Coating Specification

Custom anti-reflective (AR) coatings can be applied for specific wavelength ranges, including AR coatings optimized for 1535 nm.

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8. Standard Fabrication Specifications

Parameter	**Specification**
Diameter Tolerance	± 0.05 mm
Length Tolerance	± 0.5 mm
Surface Quality (Scratch/Dig)	10-5
Flatness	λ/8 @ 632 nm
Wavefront Distortion	λ/10 @ 632 nm
Parallelism	<10 arc seconds
Perpendicularity	<5 arc minutes

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9. POC Strength and Capabilities

Photonics On Crystals (POC) specializes in manufacturing high-quality Er:Yb:Glass with state-of-the-art facilities. Our technical team ensures precision in doping concentrations and strict adherence to quality standards. We also provide customized designs to meet unique application needs, ensuring optimal performance and reliability.

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10. Standard Products

Photonics On Crystals

Dimensions	Length	Doping Concentration	Coating	Price (USD)
3 x 3 mm	6 mm	Standard	Uncoated	500
3 x 3 mm	10 mm	Customized	AR @ 1535 nm	700
Custom	Custom	Customized	Upon request	Upon request