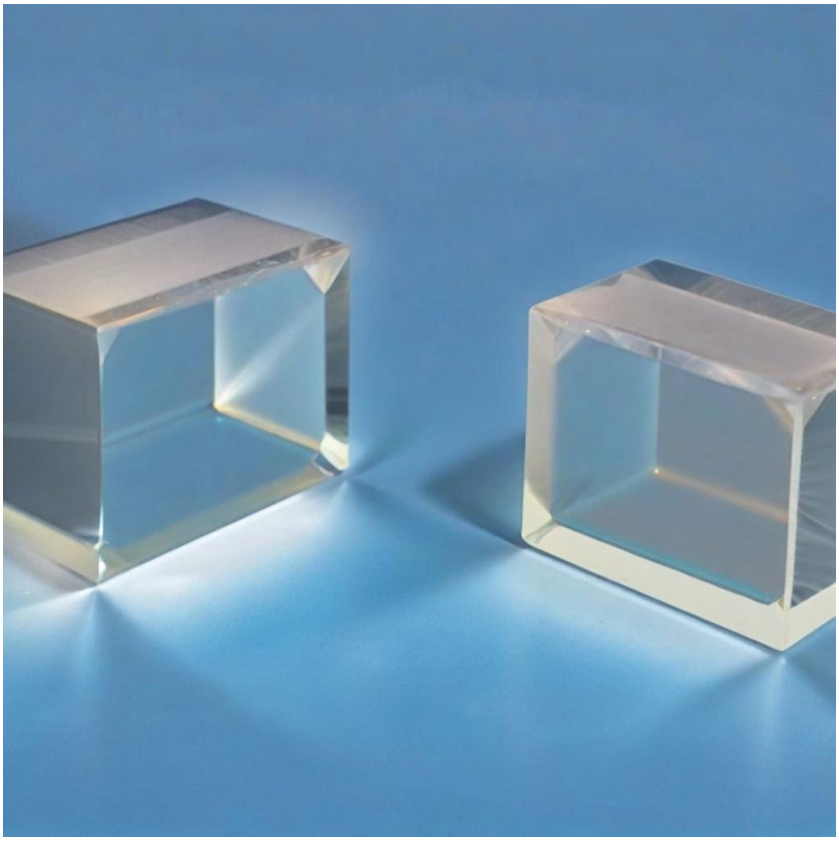
Photonics On Crystals

POC-OC-122450-Ho:YLF Crystal Datasheet

1 Main Features

- Long upper laser level lifetime for extended performance.
- High emission cross-section for efficient lasing.
- Naturally birefringent material with a weak thermal lensing effect.
- Operates in a wavelength range optimal for industrial and defense applications.
- Customizable crystals available upon request to suit specific needs.



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2. Material General Description

Holmium-doped Yttrium Lithium Fluoride (Ho:YLF) is a highly efficient laser crystal material used in various optical applications, including industrial processing, defense, and environmental monitoring. With its naturally birefringent properties, Ho:YLF minimizes thermal lensing effects and ensures stable output. The crystal exhibits a long upper laser level lifetime, enhancing its suitability for Q-switched laser operations. The optimized doping levels, high emission cross-section, and strong absorption make it an ideal choice for generating emission wavelengths around 2060 nm, particularly for pollutant detection and remote sensing. Ho:YLF also supports customizations such as doping concentrations and coatings to meet user-specific requirements.

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3. General Applications

Ho:YLF crystals are versatile and cater to a broad range of industries:

- **Environmental Monitoring**: Used for remote sensing and pollutant detection due to its strong emission properties at 2060 nm.
- **Defense and Security**: Ideal for laser systems used in target detection, surveillance, and rangefinding.
- **Medical Applications**: Provides precise and controlled energy output for surgical and diagnostic applications, including soft tissue operations.
- **Industrial Processing**: Facilitates cutting, welding, and material inspection with high precision and energy efficiency.
- **Scientific Research**: Supports experiments requiring mid-infrared wavelength lasers, including spectroscopy and material characterization.

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4. Chemical, Physical, and Structural Properties

Property	Value
Crystal Structure	Tetragonal
Absorption Peak Wavelength	1940 nm
Emission Wavelength	2060 nm
Absorption Cross-Section	1.2 x 10^-22 cm^2
Emission Cross-Section	1.8 x 10^-22 cm^2
Refractive Index (1064 nm)	n_o = 1.448, n_e = 1.470
Density	3.95 g/cm^3
Mohs Hardness	5
Thermal Conductivity	6 W/m·K
Thermal Expansion Coefficient	10.1 x 10^-6 K^-1 (
Typical Doping Level	0.5%

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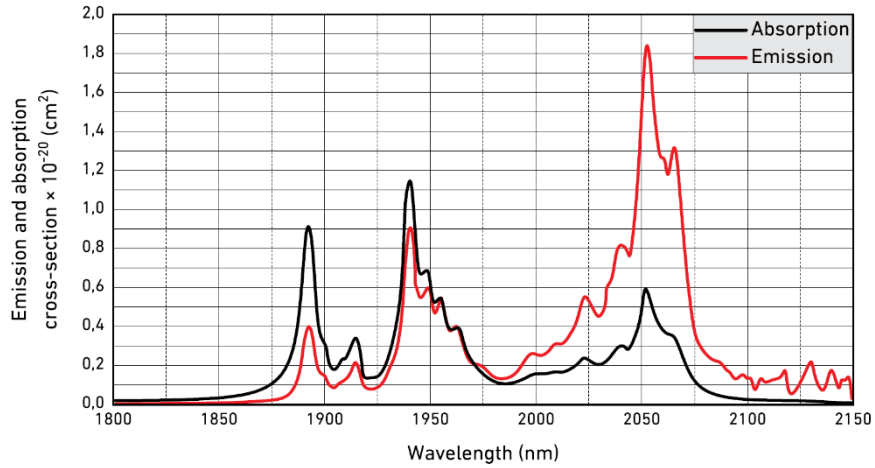
5. Optical, Laser, or Nonlinear Optical Properties

Optical Property	Value
Absorption Bandwidth	~18 nm
Lifetime of ^5I_7 Energy Level	10 ms
LIDT	>10 J/cm^2 @ 2060 nm, 10 ns

Coating Options	AR coatings at 1900-2100 nm

6. Spectrum Transmission Curves

The materials shows high absorption and emission characteristics at 2060 nm, with minimal losses and high efficiency in the Q-switched regime.



7. Coating Specifications

- Anti-reflective coating: AR(R < 1%) @ 1900-2100 nm.
- Coating improves transmission efficiency and reduces scattering losses.

8. Standard Fabrication Specifications

Parameter	**Specification**
Orientation	z-cut
Clear Aperture	>90%
Face Dimension Tolerance	+0.0/-0.1 mm
Length Tolerance	±0.1 mm
Parallelism Error	<20 arc seconds
Perpendicularity Error	<10 arc minutes
Surface Quality	20-10 S-D
Surface Flatness	<λ/10 @ 632.8 nm

9. POC Strength and Capabilities

Photonics On Crystals

Photonics On Crystals (POC) specializes in the precision fabrication of high-performance crystals. Our extensive experience in laser crystal manufacturing allows us to deliver:

- Customizable doping levels and dimensions to fit unique application requirements.
- Superior optical and mechanical quality adhering to the strictest industry standards.
- Fast turnaround and competitive pricing with excellent after-sales support.

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10. Standard Products

Face Dimensions (mm)	Length (mm)	End Faces	Doping	Coatings	Price (USD)
5 x 5	2	Brewster-angle cut	1%	Uncoated	$620
5 x 5	2	Right-angle cut	1%	AR@1900-2100 nm	$750
8 x 8	2	Brewster-angle cut	1%	Uncoated	$620
8 x 8	2	Right-angle cut	1%	AR@1900-2100 nm	$750
Customization Available	Customizable	Upon request	Custom	Custom coatings	Contact Us