

Ho:Cr: Tm: YAG introduction (Ho:Cr:TM:YAG产品介绍)

1 Advantages of Ho:Cr:Tm:YAG Crystals

- High slope efficiency
- May be flash lamp or diode pumped
- Operates well at room temperature
- Operates in a relatively eye-safe wavelength range

2 Material and Specifications

Dopant concentration	Ho:0.3~0.4at%, Tm:5~6at%,Cr:0.3~1.2at%
Orientation	[111] within 5°
Wavefront Distortion	$\leq 0.125\lambda/\text{inch}(@1064\text{nm})$
Extinction Ratio	≥ 25 dB
Rod Sizes	Diameter:3~6mm,Length:50~120mm Upon request of customer
Dimensional Tolerances	Diameter:+0.00/-0.05mm, Length: ± 0.5 mm
Barrel Finish	Ground Finish: 400# Grit
Parallelism	$\leq 30''$
Perpendicularity	$\leq 5'$
Flatness	$\lambda/10$
Surface Quality	10-5
Chamfer	0.006"±0.002"
AR Coating Reflectivity	$\leq 0.25\%$ (@2094nm)

3 Optical and Spectral Properties of Ho:Cr:Tm:YAG Crystals

Laser Transition	$^5I_7 - ^5I_8$
Laser Wavelength	2.097 μm
Photon Energy	9.55×10^{-20} J
Emission Cross Section	7×10^{-21} cm ²
Fluorescence Lifetime	8.5 ms
Index of Refraction	1.80 @2.08 μm
Absorption Linewidth	4 nm
Diode Pump Band	781 nm
Major Pump Bands	400~800 nm

4 Physical and Chemical Properties

Crystal Structure	Cubic
Lattice Parameters	12.01 Å
Melting Point	1970°C
Moh Hardness	8.5
Density	4.56±0.04g/cm ³
Specific Heat (0-20)	0.59J/g.cm ³
Modulus of Elasticity	310GPa
Young's Modulus	3.17×10 ⁴ Kg/mm ²
Poisson Ratio	0.3(est.)
Tensile Strength	0.13~0.26GPa
Thermal Expansion Coefficient	[100]Direction:8.2×10 ⁻⁶ /°C (0~250°C)
	[110]Direction:7.7×10 ⁻⁶ /°C (0~250°C)
	[111]Direction:7.8×10 ⁻⁶ /°C (0~250°C)
Thermal Conductivity	14W/m/K(@20°C)
	10.5W/m/K(@100°C)
Thermal Optical Coefficient (dn/dT)	7.3×10 ⁻⁶ /°C
Thermal Shock Resistance	790W/m
Solubility	Water: Insoluble; Common Acids: Slightly