Er:YAG - Erbium Doped Yttrium Aluminum Garnet

Introduction

Erbium Doped Yttrium Aluminum Garnet (Er:YAG) is an excellent laser crystal which lases at 2940 nm. This band is at the hydroxyl absorption peak which can be strongly absorbed by biological tissues. So it widely applies to medical area, such as dental (hard tissues), orthopedics, etc.

CASTECH's laser crystal Er:YAG is featured by

- High slope efficiency
- Operate well at room temperature
- Operate in a relatively eye-safe wavelength range

Table 1. Optical and Spectral Properties

Laser Transition	$^4I_{3/2} \rightarrow {}^4I_{11/2}$
Laser Wavelength	2940 nm
Photon Energy	6.75×10^{-20} J @2.940 μm
Emission Cross Section	3×10^{-20} cm^2
Refractive Index	1.79 @2.940 μm
Pump Bands	600~800 nm

Table 2. Specifications

Dopant Concentration	Er: ~50 at.%
Rod Sizes	Diameter: 3~6 mm, Length: 50~120 mm; Upon request of customer
Dimensional Tolerances	Diameter: ±0.1mm Length: ±0.5 mm
Surface Quality (Scratch/Dig)	10/5 to MIL-PRF-13830B
Wavefront Distortion	λ/8 @633 nm
Flatness	λ/8 @633 nm
Parallelism	≦30 arc sec
Perpendicularity	≦15 arc min
Chamfer	≦0.2 mm×45°
Extinction Ratio	≧25 dB
AR Coating Reflectivity	≦0.2% @2940 nm