

# KTP



## DESCRIPTION

$\text{KTiOPO}_4$  (KTP) has a high nonlinear coefficient (about 15 times that of KDP), high thermal conductivity (twice that of BDN crystal), a wide range of allowable temperature matching and allowable angle matching, a high threshold of resistance to gray traces and light damage, no moisture absorption and deliquescence, no decomposition below  $900^\circ\text{C}$ , good mechanical properties, easy polishing of the crystal surface, and small mismatch. Its frequency doubling efficiency for 1064 nm can reach about 80%, and the crystal can be used to make components for frequency doubling, frequency mixing, electro-optical modulation, optical parametric oscillation and optical waveguide.

## FEATURES

- High temperature resistance
- High thermal conductivity
- The mismatch is small
- The impedance ratio is large
- Broad band of light transmission
- Low temperature sensitivity
- Good mechanical properties
- Large nonlinear optical coefficient
- Chemical and mechanical properties are stable
- High photoelectric coefficient and low dielectric constant

## APPLICATIONS

- Laser ranging for frequency doubling and OPO applications
- Solid-state lasers such as neodymium-doped crystals are mixed to obtain blue light output
- Double frequency of neodymium-doped crystal laser to obtain green/red light output
- OPG, OPA and OPO obtain dimming in the range of  $0.6\mu\text{m}$ - $4.5\mu\text{m}$



# KTP

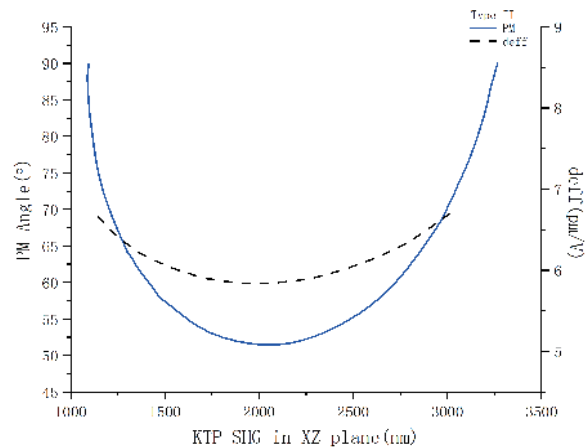
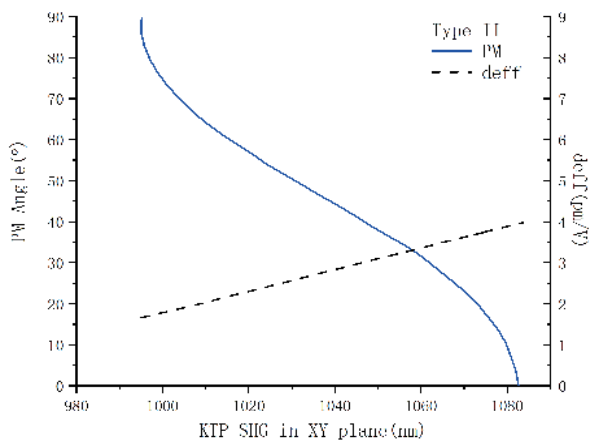
## PRODUCT PARAMETERS

Attributes	Numerical value
chemical formula	KTiOPO <sub>4</sub>
Crystal structure	Orthorhombic, space group Pna2 <sub>1</sub> , point group mm2
Lattice parameters	a=6.404Å, b=10.616Å, c=12.814Å, Z=8
melting point	About 1172°C
Moh's hardness	5
density	3.01 g/cm <sup>3</sup>
Thermal Conductivity	13W/m/K
Thermal expansion coefficient	a <sub>x</sub> =11x10 <sup>-6</sup> /°C, a <sub>y</sub> =9x10 <sup>-6</sup> /°C, a <sub>z</sub> =0.6x10 <sup>-6</sup> /°C

## NONLINEAR OPTICAL PROPERTIES

Damage Threshold: [GW/cm ]	>0.5 @1064 nm,TEM <sub>00</sub> , 10ns,10HZ(AR-coated) >0.3 @532 nm,TEM <sub>00</sub> , 10ns,10HZ(AR-coated)
SHG phase matching range	497 ~ 1800nm (Type II)
Non-vanished nonlinear susceptibility	$d_{eff(II)} \approx (d_{24} - d_{15})\sin^2\phi\sin^2\theta - (d_{15}\sin^2\phi + d_{24}\cos^2\phi)\sin\theta$
	d <sub>31</sub> =6.5 pm/V
	d <sub>24</sub> =7.6 pm/V
	d <sub>32</sub> = 5 pm/V
	d <sub>15</sub> =6.1 pm/V
Thermo-optic coefficient	d <sub>33</sub> =13.7 pm/V
	dn <sub>x</sub> /dT=1.1*10 <sup>-5</sup> /°C
	dn <sub>y</sub> /dT=1.3*10 <sup>-5</sup> /°C
	dn <sub>z</sub> /dT=1.6*10 <sup>-5</sup> /°C
For Type II SHG of a Nd:YAG laser at 1064nm	Temperature reception: 24°C cm
	Spectral acceptance: 0.56nm·cm
	Angle reception: 14.2mrad·cm (φ); 55.3mrad·cm(θ)
	Discrete angle: 0.55°

## SPECTRA



# KTP

