



KTP (POTASSIUM TITANIUM OXIDE PHOSPHATE)

GAMDAN hydrothermally-grown KTP offers

GET A
QUOTE

- Exceptionally low absorption (fully calibrated) <10ppm/cm @1064nm, <300ppm/cm@532nm (10-100x lower than flux-grown KTP)
- Excellent Homogeneity, WFD of $\lambda/10$ @633nm
- UV grade super polish for optimal high-power performance, Roughness: <5Å, S/D of 0-0
- Exceptional performance in long pulse high power medical lasers

PRODUCTS:

- [LBO](#)
- [KTP](#)
- [BBO](#)
- [Nd:YVO4](#)

GAMDAN Flux-grown KTP offers

- Excellent Homogeneity, WFD of $\lambda/10$ @633nm
- UV grade super polish for optimal high-power performance, Roughness: <5Å, S/D of 0-0
- Highly Competitive pricing for volume application

Physical Properties:

Crystal Structure	Orthorhombic
Point Group	mm2
Melting Point	1172°C incongruent
Lattice Parameters	a=6.404Å... b=10.615Å... c=12.814Å... Z=8
Temperature of Decomposition	~1150°C
Transition Temperature	936°C
Mohs Hardness	~5
Density	2.945 g/cm ³
Color	colorless
Hygroscopic Susceptibility	no
Specific Heat	0.1737 cal/g.°C
Thermal Conductivity	0.13 W/cm/°C
Electrical Conductivity	3.5x10 ⁻⁸ s/cm (c-axis, 22°C, 1KHz)
Thermal Expansion Coefficients	a1 = 11 x 10 ⁻⁶ °C ⁻¹ a2 = 9 x 10 ⁻⁶ °C ⁻¹ a3 = 0.6 x 10 ⁻⁶ °C ⁻¹
Thermal Conductivity Coefficients	k1 = 2.0 x 10 ⁻² W/cm °C k2 = 3.0 x 10 ⁻² W/cm °C k3 = 3.3 x 10 ⁻² W/cm °C
Dielectric Constant	e _{eff} = 13

Optical Properties:

Transmitting Range	350nm ~ 4500nm			
Refractive Indices		n_x	n_y	n_z
	1064nm	1.7400	1.7469	1.8304
	532nm	1.7787	1.7924	1.8873
Absorption Coefficients	a < 1%/cm @1064nm and 532nm			
Therm-Optic Coefficients	$dn_x/dT=1.1 \times 10^{-5}/^{\circ}\text{C}$			
	$dn_y/dT=1.3 \times 10^{-5}/^{\circ}\text{C}$			
	$dn_z/dT=1.6 \times 10^{-5}/^{\circ}\text{C}$			
Electro-Optic Coefficients		Low frequency (pm/V)	High frequency (pm/V)	
	r_{13}	9.5	8.8	
	r_{23}	15.7	13.8	
	r_{33}	36.3	35.0	
	r_{51}	7.3	6.9	
	r_{42}	9.3	8.8	
Sellmeier Equations	$n_x^2=2.10468 + 0.89342l^2/(l^2-0.04438)-0.01036l^2$			
	$n_y^2=2.14559 + 0.87629l^2/(l^2-0.0485)-0.01173l^2$			
	$n_z^2=1.9446 + 1.3617l^2/(l^2-0.047)-0.01491l^2$			

Nonlinear Optical Properties:

Phase Matching Range	497nm - 3300 nm
Nonlinear Coefficients (@1064nm)	$d_{31}=2.54\text{pm/V}$, $d_{31}=4.35\text{pm/V}$, $d_{31}=16.9\text{pm/V}$ $d_{24}=3.64\text{pm/V}$, $d_{15}=1.91\text{pm/V}$ at 1.064 mm
Effective Nonlinear Optical Coefficients	$d_{\text{eff}}(\text{II}) ? (d_{24} - d_{15})\sin 2q, \sin 2f - (d_{15}\sin^2 f + d_{24}\cos^2 f)\sin q$

Type II SHG of 1064nm Laser:

Phase Matching Angle	$q=90^{\circ}$ $f=23.2^{\circ}$
Effective Nonlinear Optical Coefficients	$d_{\text{eff}} \hat{=} 8.3 \times d_{36}(\text{KDP})$
Angular Acceptance	$Dq = 75 \text{ mrad}$ $Df = 18 \text{ mrad}$
Temperature Acceptance	$25^{\circ}\text{C}\cdot\text{cm}$
Spectral Acceptance	5.6 m
Walk-Off Angle	1 mrad
Optical Damage Threshold	$1.5\text{-}2.0\text{MW}/\text{cm}^2$

Main Specifications:

Dimension	1x1x0.05mm - 30x30x40mm
Phase Matching Type	Type II, $q=90^{\circ}$ f =phase-matching angle a) S1&S2: AR @1064nm $R<0.1\%$; AR @ 532nm, $R<0.25\%$. b) S1: HR @1064nm, $R>99.8\%$; HT @808nm, $T>5\%$, S2: AR @1064nm, $R<0.1\%$; AR @532nm, $R<0.25\%$
Typical Coating	Customized coating available upon customer request.
Angle Tolerance	6'
Dimension Tolerance	$Dq < \pm 0.5^{\circ}$, $Df < \pm 0.5^{\circ}$, $\pm 0.02 - 0.1 \text{ mm}$
Flatness	$(W \pm 0.1\text{mm}) \times (H \pm 0.1\text{mm}) \times (L + 0.2\text{mm}/-0.1\text{mm})$ for NKC series 1/8 @ 633nm/10/5 Scratch/dig per MIL-O-13830A <10'
Scratch/Dig Code	better than 10 arc seconds for NKC series
Parallelism	5'
Perpendicularity	5 arc minutes for NKC series
Wavefront Distortion	less than 1/8 @ 633nm
Clear Aperture	90% central area
Working Temperature	$25^{\circ}\text{C} - 80^{\circ}\text{C}$
Homogeneity	$dn \sim 10^{-6}/\text{cm}$

Data-sheet available for download in PDF:

[DOWNLOAD PDF](#)

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