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Crystal Parameters for Pockels Cells

DATA SHEET 735

Recent innovations in crystal growth have created two new crystals for Pockels cells. These are RTP and RTA single crystals. However, RTP crystals are better suited for Q switching because they have lower half-wave voltages at 1064nm, higher resistivity and higher damage thresholds. Please see the table below.

PROPERTIES of ELECTROOPTIC Q-SWITCHES

PROPERTIES	UNITS	KD*P	$LiNbO_3$	$LiTaO_3$	BBO	KTP	RTP	RTA
Point Groups		mm4	3m	3m	3m	mm2	mm2	mm2
Refractive index		1.47	2.2	2.2	1.6	1.86	1.9	1.9
Transparency	µm	0.2-2.15	0.35-4.3	0.35-4.3	0.19-3.3	0.35-4.3	0.35-4.3	0.35-5.3
Propagation direction of light		Z Optical axis	Z Optical axis	Y	Z Optical axis	Y	Y	Y
E-field direction		X(Y)	X(Y)	Z	X(Y)	Z	Z	Z
Half wave voltage (L=d) at (1064 nm): static dynamic	kV	9	9.5 16.5	5.1 5.6	87	5.8 6.4	5.4 5.8	5.5 5.9
Temperature coefficient of $V_{\lambda/2}$	%/°C	large	small	small	0.1	small	small	small
Dielectric constant	ε	48	27.9	45	6.7	15.4	11	11
Conductivity	S/cm		$>10^{12}$	$>10^{12}$	$>10^{12}$	$\sim 10^{6}$	$\sim 10^{11}$	$\sim 10^{9}$
Laser Damage Threshold (10674 nm,10ns)	MW/cm^2	500	280	400	1000	600	600	400
Extinction ratio		excellent	good	good	excellent	good	good	good
Acoustic ringing			yes	no	no	no	no	no
Available angle misalignment	arc min	~20 f(L)	~10 f(L)	>60	~20 f(L)	>60	>60	>60
Temperature stability		problem	problem	good	good	good	good	good
Hygroscope		yes	no	no	no	no	no	no