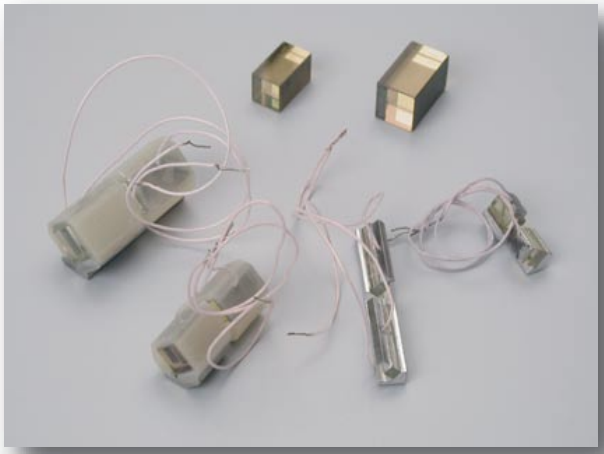
Solid-State Laser Components

Lithium Tantalate Q-Switches

Lithium tantalate - $LiTaO_3$ (LT) is an advanced crystalline material for EO devices. It has high electrooptic coefficients, good transparency in wide spectral range, low natural birefringence and high optical quality. It makes LT applicable for EO Q-switches lasers operating at 1.0…3.0 um. LT electrooptical Q-switch consists of two rectangular-parallelepiped shaped elements. Laser beam propagates along crystallographic Y-axis and it's electric field vector should be directed at 45deg to X and Z axis. Control voltage is applied along Z- axis.



To compensate for natural birefringence the pair of identical LT elements with orthogonal Z- axis orientation is used in LT Q-switch design. Input and output edges (XZ planes) are equipped with antireflection coatings, YZ-planes are covered with metal films for electric field application. Lithium tantalate Q-switches may be used both in quarter-wave and half-wave schemes. Specifications of LT Q-switches are presented in table.

PARAMETERS	TL-1.6	TL-3	TL-5	TL-8
Light aperture, mm	1.6	3	5	8
Capacity, pF	20	10	10	20
Direct quarter-wave voltage, kV	0,2	0,75	0,75	0,75
Pulse quarter-wave voltage, kV	0.22	0,85	0,85	0,85
Max. energy density, J/cm^2	5	5	5	5
Extinction ratio	50	50	50	50
Operating temperatures, C	+60-60	+60-60	+60-60	+60-60
Available angle misalignment, mrad	5	17	17	17

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