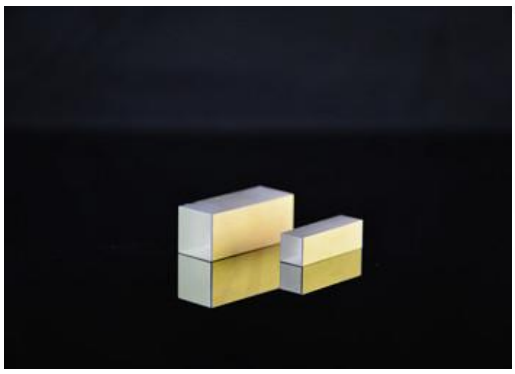
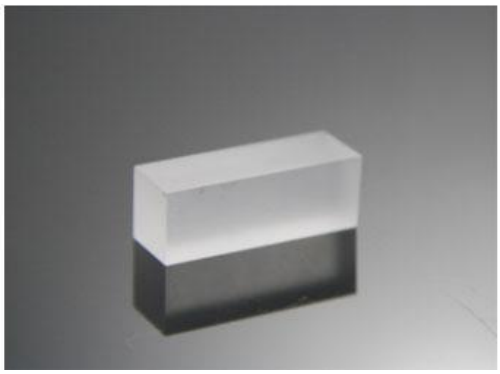
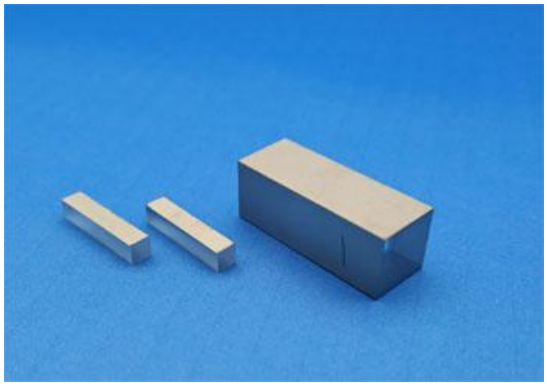
BBO Crystals for EO applications

BBO is one of the electro-optic material choices for high average power pockels cell applications. BBO has significant advantages over other materials in terms of laser power handling abilities, temperature stability, and substantial freedom from piezoelectric ringing. Because it relies on the electro optic effect, switching time - aided by the low capacitance of the Pockels cell is very fast. The wide transparency range of BBO allows it to be used in diverse applications. Double crystal design is employed in order to reduce required voltages and allowing operation in half-wave mode with fast switching times. Hangzhou Shalom EO offers the BBO crystals used in the pockels cells with AR coating and Cr-Au electrodes, stocked crystals of standard specifications is provided, and the customized special crystals is available upon customer's request.







Modules or types

A variety types of crystals are available upon your request:

- Crystal boules with inspection polishing
- Crystal blanks with inspection polishing
- Crystals with laser grade polishing
- Crystals with AR coating and Cr-Au electrod

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Features

Features:

- High repetition rate
- High peak power damage resistance
- Low absorption
- UV transmission
- Low acoustic noise

Applications

- High repetition rate DPSS Q-switches
- High repetition rate regenerative amplifier control
- Cavity dumping
- Beam chopper

SPECIFICATIONS

Specifications of BBO for EO applications	
Dimension tolerance	(W±0.1mm)x(H±0.1mm)x(L+0.5/-0.1mm)
Cut Angle	Z-Cut
Clear aperture	central 90% or the diameter
Scattering of crystals	No visible scattering paths or centers when inspected by a 50mW green Laser
Flatness	less than λ/8 @ 633nm
Transmitting wavefront distortion	less than λ/8 @ 633nm
Chamfer	≤0.2mmx45°
Chip	≤0.1mm
Surface Quality	better than 10/5 S/D (MIL-PRF-13830B)
Parallelism	≤20 arc seconds
Perpendicularity	≤5 arc minutes
Angle tolerance	≤0.25°
Coating	AR/AR@1064nm on both end surfaces Cr-Au electrode on two side surfaces
Quality Warranty Period	one year under proper use

Specifications of standard EO crystals	
Crystals	Betta BBO
Quarter-wave voltage@1064nm	~3.4KV (for crystals size: 3x3x20mm)
Optical transmission	>98%
Damage Threshold	>500MW/cm^2 @1064nm, 10nS
Wavefront distortion@1064nm	<Lambda/8
Typical capacitance	< 3pf

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Standard Modules	Size
SHBBO-EO320	3x3x20mm
SHBBO-EO420	4x4x20mm
SHBBO-EO425	4x4x25mm

If you need the BBO crystals of other size, please contact with us.

Application Notes

Calculation of Quarter-wave Voltage

The voltage required to produce a retardance of π radians is called the halfwave voltage or simply Vπ. For an optical input linearly polarized 45° applying a halfwave voltage rotates the polarization by 90°.When the output wave is passed through a linear the resultant can be rapidly modulated from maximum intensity to minimum intensity by rapidly changing the voltage applied to the crystal from 0 volts to Vπ.

The halfwave voltage of BBO is dependent on the optical wavelength and is given by:

$$V\pi := \frac{\lambda}{2 \cdot no^3 \cdot r22} \cdot \frac{d}{L}$$

Where λ=optical wavelength
d=electrode spacing
L=optical path length
r22=electro-optic coefficients
no=ordinary indices of refraction

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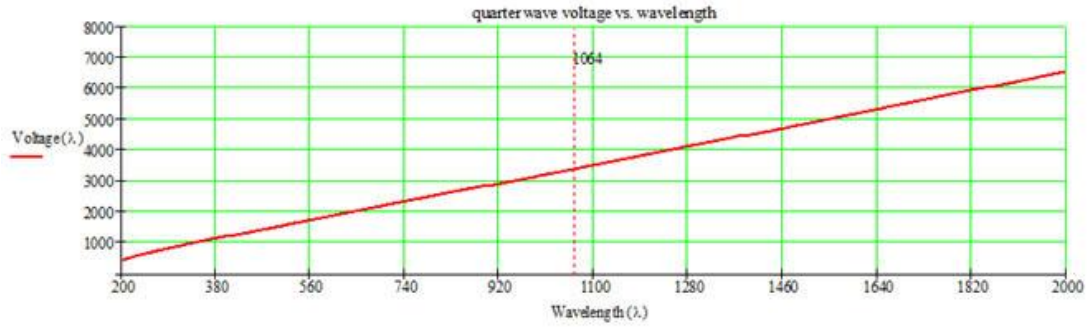

EO Q-Switch 1/4Wave Voltage Vs Vavelength (3x3x20mm)

1/4 Wave Voltage @1030nm : Vπ/2 =3388V

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