

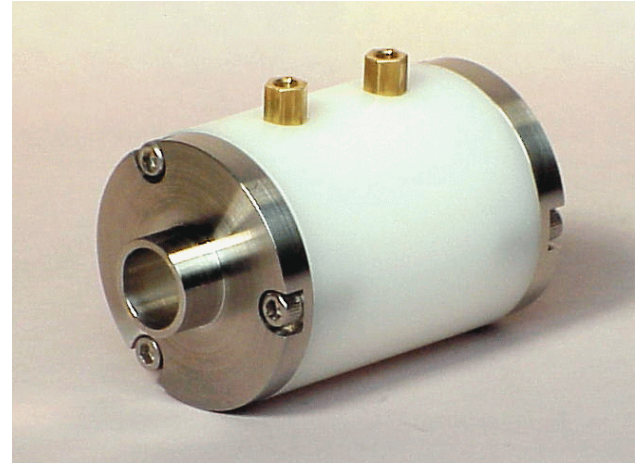
- **Wide Spectral Range 250 nm to 1100 nm**
- **High Extinction Ratio**
- **Negligible Piezoelectric Response**
- **High Damage Threshold**
- **High Average Power Capability**
- **Single & Double Crystal Configurations**

BBO (Beta Barium Borate) is noted for its excellent optical quality and low strain birefringence. This results in high extinction ratios and low wavefront distortion. Low absorption provides excellent transmission efficiency in the UV and near IR. Q-switches fabricated from BBO can be operated at high repetition rates and high average power.

Operation of BBO modulators and Q-switches from single shot to repetition rates of more than 50 kHz is possible with negligible piezoelectric response. Series 1150 devices are compatible with FastPulse's Laser Pulse Gating Systems. They are used in regenerative laser amplifiers for seeding and gating, Laser Pulse Chopping and Polarization Rotation applications. One advantage of BBO devices is that they do not induce significant piezoelectric ringing on the transmitted laser beam.

BBO has a useful optical wavelength range from 250 nm to 2100 nm. Transmittance, in the 350 to 1100 nm range, with "V" type narrow band, high efficiency Anti-Reflection coated windows is approximately 98.5%.

Typical intrinsic extinction ratios of single crystal BBO devices are greater than 1000:1 (> 30 db) measured at 633 nm. Single pass wavefront distortion is <1/8 wave at 633 nm. Thermal stability is excellent over a broad temperature range. BBO crystals are slightly hygroscopic and in many applications must be enclosed in a sealed housing. In a dry, appropriately clean, dust-free, enclosure, all devices within the series can be used without protective windows.



The damage threshold of BBO is of the same order as deuterated KD*P and RTP, approximately 850 MW/cm² for a 10 nanoseconds wide Q-switched pulse at 1064 nm. In gating applications with laser pulses <100 picoseconds, the damage threshold is in the 10 GW/cm² range.

Driving voltages required for BBO crystals to attain 1/4 or 1/2 wave retardation can be significantly higher than for KD*P, Lithium Niobate and RTP crystal devices. Reduced voltage operation is attained by use of a transverse field configuration where required drive voltage becomes a function of crystal dimensions: the ratio of width between electrodes to overall crystal length.

The 1150 Series has an industry standard 35 mm diameter, convenient for optical mounts. The physical size is identical with FastPulse's Series Q1059P KD*P and 1147 RTP devices and may easily replace them in many of the company's E-O systems. Series 1150 devices are being used in the company's Models 5046, 5057 and 5100 Series Laser Pulse Extraction/ Chopping Systems, as well as the 5048, 5056, and 5060 Q-switching Systems and 8025S HV Generator. All of these drivers provide pulsed high voltages with zero DC voltage applied to the crystal.

1150 SERIES - NOMINAL SPECIFICATIONS

Model Number		1150-3	1150-4	1150-5	1150-6
Aperture Diameter, mm		3	4	5	6
Crystal Material		BBO (Beta Barium Borate)			
Peak Optical Power Density Capability (Uniform Beam, no Hot Spots)		850 MW/cm ² for pulses <10 nsec wide 10 GW/cm ² for pulses <100 psec wide			
λ Range for Peak Power Density		350-1300 nanometers			
Transmission (with appropriate antireflection coatings)		> 98% from 300 nm to 1100 nm			
½ Wave Retardation Voltage, kVolts (See Note below)	@ 633 nm	3.4	4.6	5.7	6.9
	@ 800 nm	4.3	5.8	7.2	8.7
	@ 1064 nm	5.8	7.7	9.6	11.5
Extinction Ratio, Full Aperture Beam		> 1000:1 at 633 nanometers			
Intrinsic Rise Time, picoseconds		< 350			
Capacitance, picofarads (approximate)		6			
Weight, grams (approximate)		125			

NOTE: Recommended maximum applied DC voltage is approximately 1.0kV/mm of aperture size. Voltage requirement can be reduced by a factor of approx. 2 by use of two crystals, optically in series and electrically in parallel.

