

Acousto-Optic Deflectors

Devices designed specifically for high-speed solid-state scanning of light beams

Acousto-optic deflectors (AOD) can achieve laser beam scanning by changing the RF driving frequency, and the scanning position can achieve random position, continuous line scanning, and sequential point deflection. Depending on crystal, wavelength, and beam size, scan rates in excess of 200 MHz can be achieved, along with precise position control of nRad.

The optimal efficiency of an AOD typically requires the input laser beam to be set at a Bragg angle, when scanning the laser beam a Bragg angle mismatch occurs, this is due to the fact that the AOD can only be optically aligned at one drive frequency. This generally results in lower efficiency. CASTECH's team has the design experience to cleverly solve the problem, such as using longitudinal modes and using phased array piezoelectric cells within the transducer to design and produce large bandwidth AODs with high resolution. We design AOD for 1D and 2D scanning, and together with the specially developed broadband RF driver, we can realize various control methods such as frequency sweeping and chirping, which makes it easy for customers to realize multiple functions quickly.

CASTECH's products are produced independently throughout the entire process and can be customized according to customer needs. Refer to the following list for standard products.



Applications

- Laser display
- Laser tweezers
- Heterodyne interferometer
- Micromachining
- Optical inspection

Model Number: 1D-Deflectors CADF-f-r-a-mt-w-cn-h | 2D-Deflectors CADFD-f-r-a-mt-w-cn-h

Center Frequency (f)	RF Range (r)	Aperture (a)	Material (m)	Mode (t)	Wavelength (w)	RF Connector (c)	Number of connectors (n)*	Housing (h)
070 (70MHz) ...	10 (±10 MHz) ...	010 (1 mm) ...	CQ (Crystalline Quartz) TE (TeO2)	C (Compressional) S (Shear)	266 (266nm) ...	AF (SMA-F) ...	D(Double-Input)	A33 ...

* Only applicable to dual RF type acousto-optic deflectors

Typical Specification

Wavelength	Aperture	Operation frequency	Scan dimensions	Scanning Angle	Diffraction Efficiency	Material
266 nm	1×26 mm ²	210±60 MHz	1D	5.5 mrad	>40 %	CQ
355 nm	7 mm	170±30 MHz	1D	3.7 mrad	>80 %	CQ
364 nm	3.5 mm	100±40 MHz	1D	47 mrad	>50 %	TE
405 nm	4 mm	100±25 MHz	1D	32.4 mrad	>70 %	TE
592 nm	7.5 mm	100±25 MHz	1D	43 mrad	>70 %	TE
813 nm	5 mm	100±20 MHz	1D	50 mrad	>70 %	TE
1064 nm	1-3 mm	90±16 MHz	1D	50 mrad	>80 %	TE
355 nm	7 mm	110±20 MHz	2D	2.2×2.2 mrad	>50 %	CQ
532 nm	10 mm	85±25 MHz	2D	40×40 mrad	>40 %	TE

Housing dimensions(mm):

