Acousto-Optic Deflectors

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

Acousto-optic deflector (AOD) can achieve laser beam scanning by adjusting the radio frequency (RF) driving frequency, enabling random position scanning, continuous line scanning, and sequential point deflection. By optimizing the crystal, wavelength, and beam size, AODs can achieve scanning rates exceeding 200 MHz and precise position control at the nano-radian level

The optimal efficiency of an AOD typically requires the input laser beam to be set at the Bragg angle. However, when scanning the laser beam, Bragg angle mismatch occurs because the AOD can only achieve optical alignment at a single driving frequency. This generally leads to a reduction in efficiency. The CASTECH team, with extensive design expertise, has ingeniously addressed this issue. For example, by employing longitudinal modes and utilizing phased-array piezoelectric cells within the transducer, they have designed and produced wide-bandwidth AODs with high resolution.

We design AOD for ID 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 AODs are fully in-house manufactured and customizable to meet specific needs. Explore our standard product range below.

Applications

- ●Laser direct writing
- ●Wafer inspection
- ●Precision circuit board drilling
- ●Biological cell detection
- ●Optical tweezers

Model Number: 1D Deflector CADF-f-r-a-mt-w-cn-h| 2D Deflector 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(70 MHz) …	10(±10 MHz) …	010 (1 mm) …	CQ(Crystalline Quartz) E(TeO2)	C (Compres-sional) S (Shear)	266 (266 nm) …	AF(SMA-F) …	D(Double-Input) …	A33 …

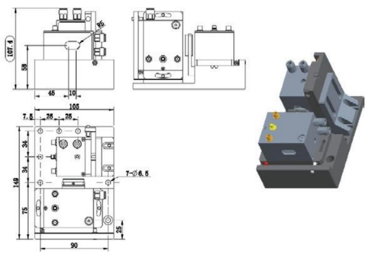
*Only applicable to dual RF type AO deflectors

Typical Specifications

Wavelength	Aperture	Operation Frequency	Scan Dimensions	Scanning Angle	Diffraction Efficiency	Material
266 nm	1×30 mm	210±60 MHz	1D	5.5 mad	>60%	CQ
355 nm	≥7 mm	160±40 MHz	1D	4.9 mad	>85%	CQ
364 nm	8 mm	100±25 MHz	1D	35.5 mad	>70%	TE
405 nm	8 mm	120±25 MHz	1D	32.0 mad	>70%	TE
488 nm	2 mm	180±40 MHz	1D	60.5 mad	>65%	TE
532 nm	≥7 mm	140±30 MHz	1D	5.5 mad	>85%	CQ
532-633 nm	8-10 mm	100±25 MHz	1D	43.0 mad @592 nm	>70%	TE
780-905 nm	8 mm	100±21 MHz	1D	53.0 mad @820 nm	>70%	TE
1064 nm	6 mm	80±15 MHz	1D	5.5 mad	>80%	CQ
1064 nm	1-7 mm	90±16 MHz	1D	50 mad	>80%	TE
355 nm	7 mm	160±40 MHz	2D	4.9 x 4.9 mad	>70%	CQ
532 nm	10 mm	85±25 MHz	2D	40 x 40 mad	>40%	TE

Housing dimensions(mm):

F23



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