Photonics On Crystals

POC-OC-120207-Acousto-Optic Deflectors Datasheet

Key Features

- Supports high-speed laser beam scanning with precise position control.
- Achieves scan rates exceeding 200 MHz with sub-milliradian resolution.
- Customizable for 1D and 2D scanning, enabling versatile applications.
- Operates across a wide wavelength range, from 266 nm to 1064 nm.
- High diffraction efficiency (>80%) and broad RF frequency compatibility.

General Description

Photonics of Crystals (POC) **Acousto-Optic Deflectors (AOD)** provide advanced solutions for high-speed laser beam scanning, leveraging the modulation of RF driving frequencies to achieve precise deflection and beam positioning. The AODs facilitate random position scanning, continuous line scanning, and sequential point deflection, offering exceptional flexibility for diverse applications.

The devices are designed for optimal efficiency, requiring alignment at the Bragg angle for maximum performance. POC has innovatively addressed potential inefficiencies caused by mismatched angles through the integration of longitudinal modes and phased array piezoelectric cells within the transducer. This results in large bandwidth AODs with superior resolution and reliability.

POC AODs are available for both 1D and 2D scanning and can be paired with specialized broadband RF drivers to enable advanced control methods, such as frequency sweeping and chirping. These features simplify implementation and empower users to perform complex tasks efficiently and effectively.

General Applications and Examples

1. **Laser Display Systems:**
   POC AODs provide smooth and rapid laser beam movement for high-resolution projection

and imaging, ensuring vivid displays and minimal lag for industrial and entertainment applications.

2. **Micromachining:**
   Precision laser deflection allows for intricate micromachining tasks, such as drilling and cutting, where accurate beam placement and movement are critical to achieving high-quality results.

3. **Optical Inspection Systems:**
   Used in automated quality control systems, AODs enable high-speed scanning of laser beams across surfaces, identifying defects or inconsistencies with high precision.

4. **Heterodyne Interferometry:**
   In metrology applications, AODs are used to modulate light beams for interference measurements, ensuring accurate readings in research and industrial environments.

Our Standard Products and Model Numbers

Model Type	Center Frequency (MHz)	RF Range (MHz)	Aperture (mm)	Material	Mode	Wavelength (nm)	RF Connector	Housing
1D-Deflectors	70	10 ±10	1	CQ / TE	C / S	266	SMA-F	A33
2D-Deflectors	70	10 ±10	1	CQ / TE	C / S	266	SMA-F	C66

Typical Specifications

Wavelength (nm)	Aperture (mm² / mm)	Operating Frequency (MHz)	Scan Dimensions	Scanning Angle (mrad)	Diffraction Efficiency (%)	Material
266	1 x 26	210 ±60	1D	5.5	>40	CQ
355	7	170 ±30	1D	3.7	>80	CQ
364	3.5	100 ±40	1D	47	>50	TE
405	4	100 ±25	1D	32.4	>70	TE
532	10	85 ±25	2D	40 x 40	>40	TE

Housing Dimensions (mm)

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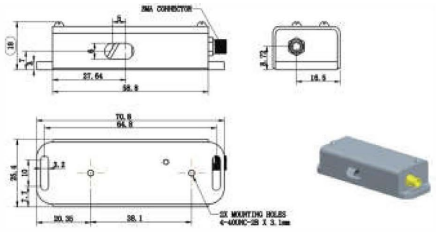
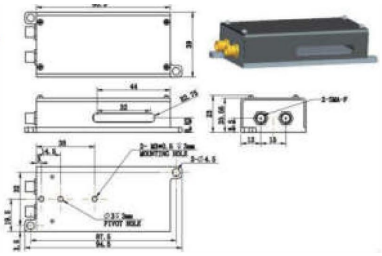
- **A33:** 38 x 20 x 16 mm, designed for compact setups and seamless integration.
- **C66:** 96 x 36.6 x 16 mm, ideal for high-power, high-frequency operations.

A33



C66



POC Strength and Capabilities

Photonics of Crystals (POC) is at the forefront of acousto-optic innovation, providing highly efficient and customizable solutions for various industries. Our Acousto-Optic Deflectors combine cutting-edge technology with robust design, ensuring reliable performance across demanding applications.

Why Choose POC?

- **Advanced Design Expertise:** Our team leverages extensive knowledge to optimize AOD efficiency and performance, addressing challenges like Bragg angle mismatches with innovative solutions.
- **High Customizability:** We provide tailored designs for 1D and 2D scanning, as well as custom apertures, wavelengths, and frequencies to meet specific user requirements.
- **Global Applications:** From micromachining to metrology, our AODs serve a diverse range of industries, consistently delivering superior results.
- **Dedicated Support:** With a commitment to customer satisfaction, POC offers comprehensive support from initial design to post-deployment.

Explore how our Acousto-Optic Deflectors can elevate your optical systems with precision and reliability.