Photonics On Crystals

POC-OC-120208-Acousto-Optic Frequency Shifters Datasheet

Key Features

- Compact, efficient design for frequency shifting of optical beams.
- Supports frequency shifts from 20 MHz to 300 MHz with high precision.
- Utilizes high-performance Tellurium Oxide (TeO2) for superior acoustic and optical properties.
- Low insertion loss and high damage threshold for reliable operation.
- Customizable options for center frequency, frequency shift range, and RF driver integration.

General Description

Photonics of Crystals (POC) **Acousto-Optic Frequency Shifters (AOFS)** are highly efficient devices designed to alter the frequency of optical beams. By superimposing ultrasonic frequencies via RF signals, the devices achieve precise frequency shifts, allowing for versatile optical system applications.

The laser beam passing through an AOFS is diffracted, and the output beam is frequency-shifted depending on the angle of incidence and RF signal. AOFS units can also be cascaded to produce sum or difference frequency combinations, providing greater flexibility. POC AOFS units support frequency shifts ranging from 20 MHz to 300 MHz, with bicrystal devices available for extended range and customization.

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These frequency shifters are constructed using high-quality Tellurium Oxide (TeO2), a material known for its exceptional acoustic and optical performance. This ensures the lowest possible insertion loss, a high damage threshold, and robust reliability for demanding applications.

POC also offers matched RF drivers and inverter drivers to maximize device performance, ensuring seamless integration into user systems. The combination of innovative design and customizable options makes POC AOFS devices the preferred choice for cutting-edge optical applications.

General Applications and Examples

1. **Interferometry:**
   AOFS units are used in interferometric systems to introduce precise frequency shifts in light beams, enabling high-resolution measurements in research and industrial applications.
2. **Laser Doppler Velocimetry:**
   Frequency shifters allow accurate measurement of fluid or particle velocities by introducing controlled frequency shifts in Doppler-based systems.
3. **Optical Heterodyne Detection:**
   AOFS units facilitate optical frequency mixing for signal analysis, improving detection sensitivity and resolution in heterodyne systems.
4. **Laser Cooling:**
   Frequency-shifted laser beams enable precise manipulation of atomic and molecular motion, making AOFS critical in experimental physics setups.

Our Standard Products and Model Numbers

Model Type	Center Frequency (MHz)	RF Range (MHz)	Aperture (mm)	Material	Mode	Frequency Mode	Fiber Type	Fiber Termination	Wavelength (nm)	RF Connector	Housing
Free-Space Frequency	70	10 ±10	1	CQ / TE	C / S	Beat / Sum	-	-	633	SMA-F	A17
Fiber-Coupled Frequency	70	10 ±10	1	CQ / TE	C / S	Beat / Sum	HI1060	Bare / FC/APC	633	SMA-F	A61

Typical Specifications

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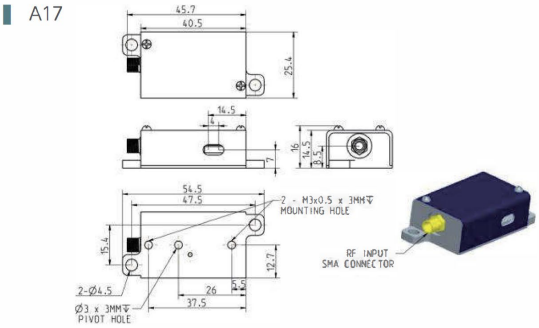
Wavelength (nm)	Active Aperture (mm)	Operating Frequency (MHz)	Material
355–532	1–3	110	CQ
532	2	80	TE
633	1–3	20	TE
1064	1	70 ±15	TE
1550	1–1.5	110 ±10 / 80	TE

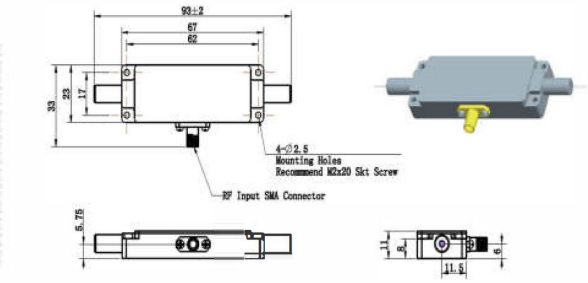
Housing Dimensions (mm)

- **A17:** 65.7 x 40.5 x 25.1 mm, optimized for compact setups with high integration flexibility.
- **A61:** 98.2 x 67 x 36 mm, suited for larger, high-power configurations.

A17



A61



POC Strength and Capabilities

Photonics of Crystals (POC) is a leader in photonics innovation, providing top-tier Acousto-Optic Frequency Shifters designed to meet the rigorous demands of advanced optical systems. Our products are known for their precision, durability, and flexibility.

Why Choose POC?

- **Innovative Design:** POC AOFS devices are engineered for high-frequency shifts with minimal insertion loss and unmatched accuracy.
- **Tailored Solutions:** We offer fully customizable specifications, including frequency range, aperture size, and wavelength, to meet unique application requirements.
- **Cutting-Edge Materials:** The use of high-quality Tellurium Oxide ensures outstanding performance and reliability under challenging conditions.
- **Expert Support:** Our dedicated team of engineers provides complete support, from design customization to after-sales service, ensuring customer satisfaction.

Choose POC to enhance your optical systems with world-class Acousto-Optic Frequency Shifters.