

Acousto-Optic Frequency Shifters

Frequency shift device that superimposes ultrasonic frequencies on the input light

Acousto-optic Frequency Shifter (AOFS) is a compact device specifically designed to achieve frequency shifting. When a laser beam passes through an AO frequency shifters, the diffracted output beam undergoes a frequency shift. Depending on the selected incident angle, the AO frequency shifters will up-shift or down-shift the frequency based on the applied RF signal frequency. Additionally, two or more AOFS devices can be cascaded to achieve sum-frequency or difference-frequency combinations.

Our team offers standard products with frequency shift ranges of 20-300 MHz, including dual-crystal designs. The AO frequency shifters utilize tellurium dioxide (TeO_2), a material with a high acousto-optic figure of merit. All TeO_2 crystals are grown and polished in-house by CASTECH, ensuring low insertion loss and a high damage threshold.

CASTECH provides customized specs including center frequency and the shifted frequency value. Meanwhile, CASTECH is able to provide AOFS-matched series of RF inverter drivers, and the corresponding RF drivers can be selected according to product specifications.

CASTECH's AOFS are fully in-house manufactured and customizable to meet specific needs. Explore our standard product range below.



Applications

- Interferometry
- Laser cooling
- Laser doppler velocimetry
- Optical heterodyne detection

Model Number: Free-Space Frequency Shifters CAFS-f-r-a-mt-w-c-h Fiber-Coupled Frequency Shifters CAFSF-f-r-mtq-xb-w-c-h

Center Frequency (f)	RE Range (r)	Aperture (a)*	Material (m)	Mode(t)	Frequency Mode (q)***	Fiber Type (a)**	Fiber Termination (b)**	Wave-length(w)	RF Connector (c)	Housing (h)
070 (70 MHz)	10 (± 10 MHz)	010 (1 mm)	CQ TE	C (Compres- sional) S (Shear)	D (Beat Frequency) S (Sum Frequency)	1(HI 1060)	B(Bare Fiber) F(FC/APC)	633 (633 nm)	AF (SMA-F)	A17
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* Only applicable to free space type

**Only applicable to fiber coupled type

***Only applicable to coupled cascade combination type

Typical Specifications

Wavelength	Active Aperture	Operation Frequency	Material
355-422 nm	1-3 mm	100 \pm 25 MHz	CQ
532-780 nm	1-3 mm	110 MHz	TE
532-1064 nm	1-3 mm	200 MHz	TE
532 nm	2 mm	80 MHz	TE
633 nm	1-3 mm	20 MHz	TE
633 nm	1-3 mm	40 MHz	TE
1064 nm	1 mm	70 \pm 15 MHz	TE
1550 nm	1.5 mm	80 MHz	TE

Housing dimensions(mm):

