

# Acousto-Optic Frequency Shifters

The **acousto-optic frequency shifter(AOFS)** with RF driver is used to modify the frequency of the optical beam. Due to the Doppler shift, the frequency shift of 1st order diffracted light (variation quantity of wavelength) equals to the frequency of RF signal (wavelength). If the incident direction of acoustic wave and optic wave are the same, the shifted laser frequency value will be positive, on the other hand, if the incident direction of acoustic wave and optic wave are opposite, the shifted laser frequency value will be negative.

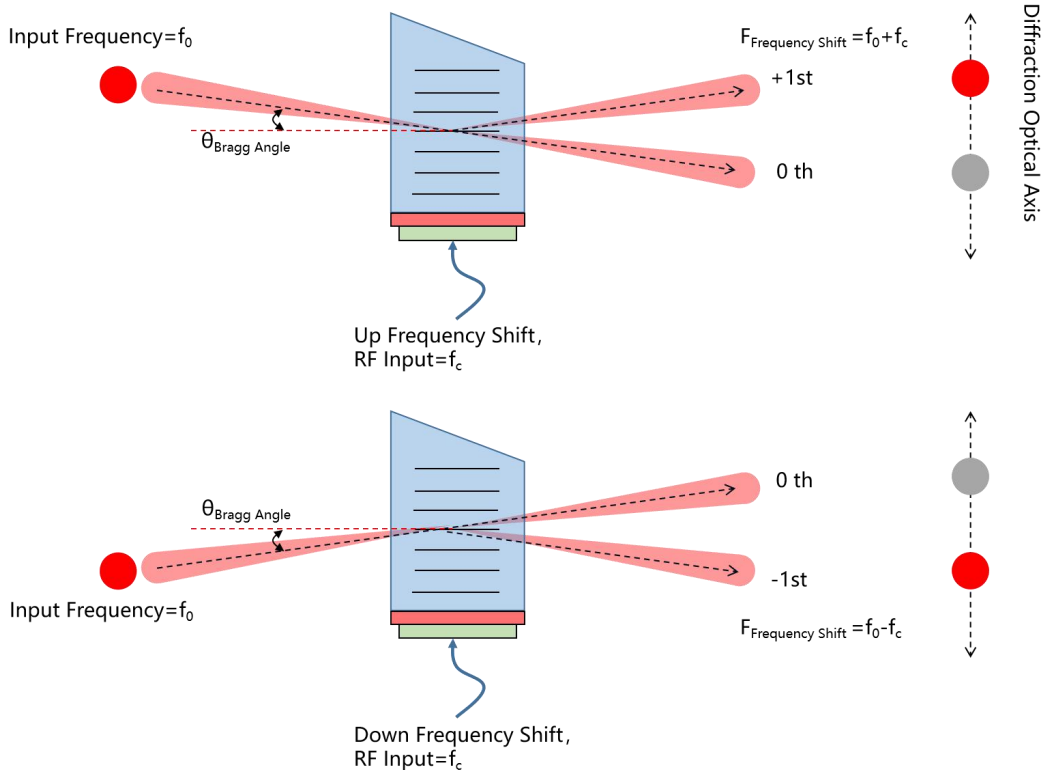


Applications such as interference-based optical techniques require a high extinction ratio between the diffracted and undiffracted beam.

CASTECH provides customized specs including center frequency and the shifted frequency value.

## Applications

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



Schematic diagram of frequency shifter

# Acousto-Optic Frequency Shifters

## Free-Space Frequency Shifters Model Number: CAFS-f-r-a-mt-w-c-h

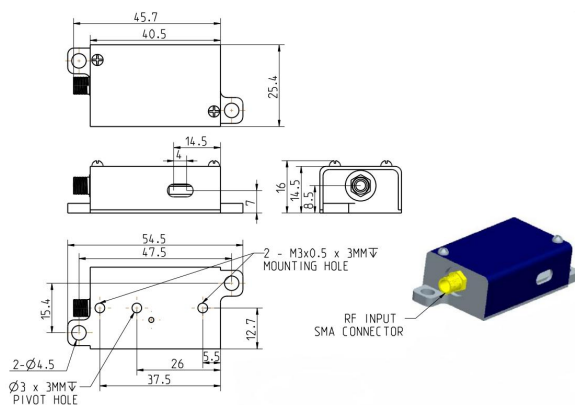
Center Frequency (f)	RF Range (r)	Aperture (a)	Material (m)	Mode (t)	Wavelength (w)	RF Connector (c)	Housing (h)
41 MHz 70 MHz 73 MHz 80 MHz 83 MHz 100 MHz ...	3 (±3 MHz) 10 (±10 MHz) ...	010 (1 mm) 020 (2 mm) 030 (3 mm) 040 (4 mm) 050 (5 mm) 060 (6 mm) ...	TE (TeO <sub>2</sub> )	C (Compressional) S (Shear)	583 nm 770 nm 1030 nm 1064 nm ...	AF (SMA-F) AM (SMA-M) ...	A17 A33 B07 B17 ...

### Typical Specifications

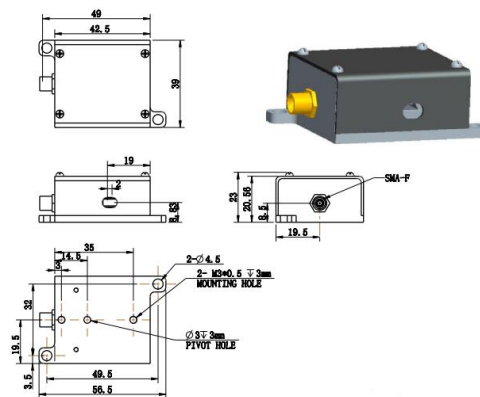
Center Frequency	Active Aperture	Wavelength	Transmission	Frequency Shift Range	Diffraction Efficiency
70 MHz	0.5~2 mm	1064 nm	≥ 99.0%	± 3 MHz	≥ 85%
80 MHz	0.5~2 mm	1064 nm	≥ 99.0%	± 10 MHz	≥ 80%
80 MHz	0.5~2 mm	1550 nm	≥ 99.0%	± 15 MHz	≥ 70%

### Housing dimensions(mm):

A17



B07



# Acousto-Optic Frequency Shifters

## Fiber-Coupled Frequency Shifters Model Number: CAFSF-f-p-mqat-w-c-h

RF Frequency (f)	RF Power (p)	Material (m)	Crystal Quantity (q)	Fiber Type (a)	Fiber Terminal (t)	Wavelength (w)	RF Connector (c)	Housing (h)
41 MHz 73 MHz 80 MHz 100 MHz 120 MHz 150 MHz 200 MHz ...	020 (≤2 W) 025 (≤2.5 W) ...	TE (TeO <sub>2</sub> )	S D	1 (HI1060) 2 (PM980) 3 (PM 10/125) 4 (10/125) 5 (20/125) 6 (10/125GDF) 7 (PM1550XP) 8 (PM1060L) 9 (SM28e) ...	B (Bare Fiber) F (FC/APC)	1030 nm 1064 nm 1550 nm ...	AF (SMA-F) AM (SMA-M) ...	A61 A91 B03 ...

## Typical Specifications

Center Frequency	Wavelength	Insertion Loss	Extinction Ratio	Frequency Shift Range
80 MHz	1550 nm	≤ 2.5 dB	≥ 45 dB	± 3 MHz

## Housing dimensions(mm):

