Fiber Coupled Acoustic-Optic Modulator/Shifters

(400 to 2300nm, 80, 100, 200 MHz)

Features

- Low Loss
- Low Cost
- Stable

Applications

- Fiber Lasers
- Pulse Picker
- Sensor

Revised on 03/31/23

Product Description

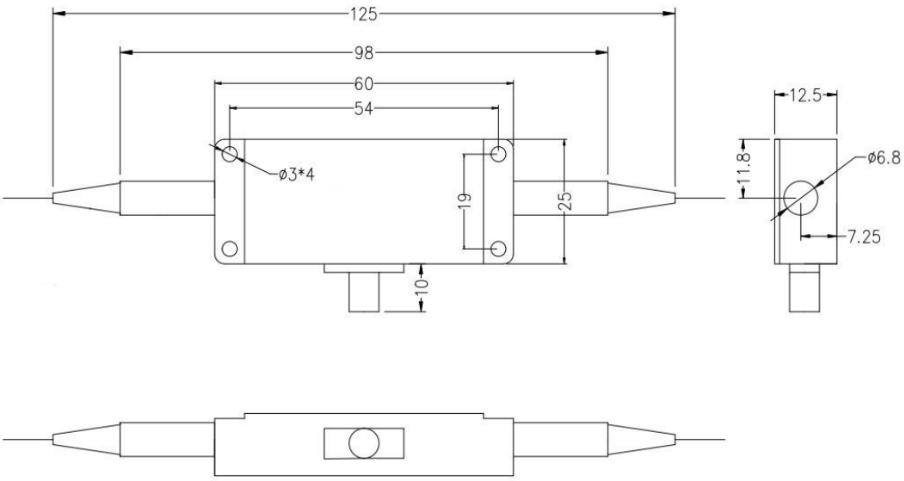
An optical intensity modulator can be achieved by a driving circuitry in which the acoustic intensity inside the crystal varies with an input modulation signal. A typical acoustic driver output is shown below: the driver typically outputs fixed carrier oscillations at the acoustic frequency). When an RF electrical signal is input, the circuit modulates the intensity profile of the carrier oscillations, resulting in a modulated driving signal, which in turn leads to an output optical intensity similar to the RF input. The acoustic frequency intrinsically determines the rise/fall of the optical modulation. The Modulation Bandwidth is proportional to the acoustic frequency and limited by the rise/fall time. The optical response can be optimized to a certain extent via the driving circuitry, such as digital or analog.

Performance Specifications

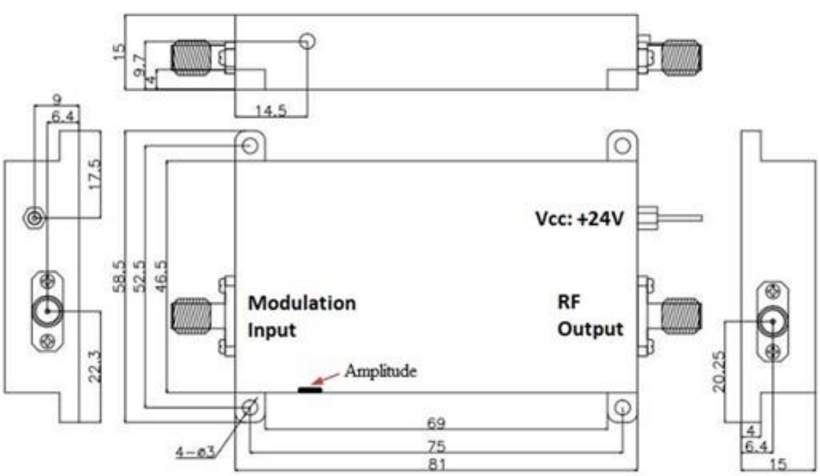
Parameter		Min	Typical	Max	Unit
Center Wavelength		450	1550	2300	nm
Wavelength Bandwidth			±30		nm
Acoustic Frequency		80	120	200	MHz
Modulation Bandwidth	(80MHz)	DC		15	MHz
	(100MHz)	DC		25	
	(200MHz)	DC		45	
Wavelength Shift	(80MHz)		±40		MHz
	(100MHz)		±60		
	(200MHz)		±200		
Insertion Loss [1]	(1030nm~1550nm)	1	1.5	2.5	dB
	(450nm~980nm)	1	3.5	5	
Polarization Dependent Loss			0.2	0.5	dB
Extinction Ratio (On/Off)		45	50	55	dB
Rise/Fall Time [2]	(80MHz)	25	50		ns
	(100MHz)	18	20		
	(200MHz)	8	10		
Return Loss		40			dB
Voltage Standing Wave Ratio			1.2:1		
Polarization Extinction (PM)		18	20	25	dB
Average Optical Power			0.5	20	W
Input Impedance			50		Ω
RF Power [3]			2.5	3.5	W
Electrical Interface			SMA		
Ultrasonic Velocity			4200		m/s
Operating Temperature		-10		65	ºC
Storage Temperature		-45		85	ºC

1. Connector typically IL increase 0.2-0.3dB, RL increase by 5dB, and ER reduces by 2dB. PM connector key is aligned to slow axis as a default.
2. (10%-90%).
3. The device is designed to be operated at 2.5W and meet the spec, but can handle a maximum of 3.5W with sufficient cooling

Dimensions (Unit: mm)



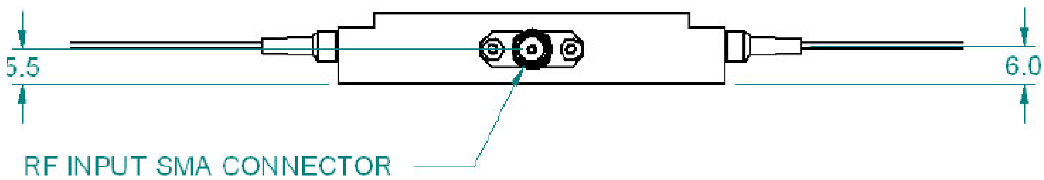
AOM



AOM Driver

*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

Electrical/Computer Connection



Ordering Information

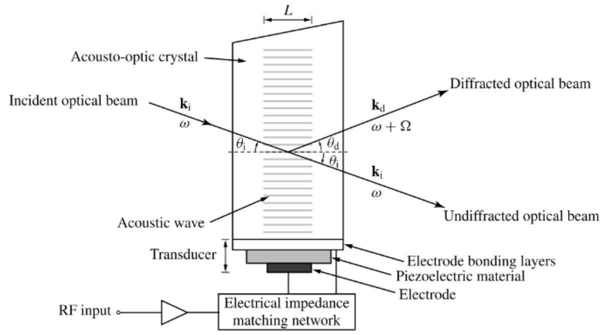
	☐	☐	☐	☐	☐	☐	☐	☐	☐
Prefix	**Type**	**Wavelength**	**Insertion***	**Optical Power**	**Frequency**	**Fiber Type**	**Fiber Cover**	**Fiber Length**	**Connector**
AOMF-	TeO2 = 1	1060 nm = 1	2.5dB=1	0.5W = 1	80MHz = 8	SMF-28 = 1	900um tube =3	0.25m = 1	None = 1
	Special= 0	1550 nm = 5	1.5dB=2	5W = 2	100MHz = 1	PM1550 = 5	Special = 0	0.5m = 2	FC/PC = 2
		1310 nm = 3	1dB=3	10W = 3	200MHz = 2	PM 980 = 3		1.0 m = 3	FC/APC = 3
		980 nm = 9		20W = 4		Hi 1060 = G		Special = 0	SC/PC = 4
		630 nm = 6		30W = 5		SM1950 = 6			SC/APC = 5
		750 nm = 7				PM1950 = 7			ST/PC = 6
		530 nm = 5				PM400 = A			LC = 7
		450 nm = 4				PM480 = B			Special = 0
		2000 nm = 2				PM630 = C			
		Special = 0				PM780 = D			
						PM850 = E			
						Hi 780 = F			
						SM450 = H			
						Special = 0			

*For 1310-1550nm. Short wavelength and >1900nm, the loss is higher

- Special order

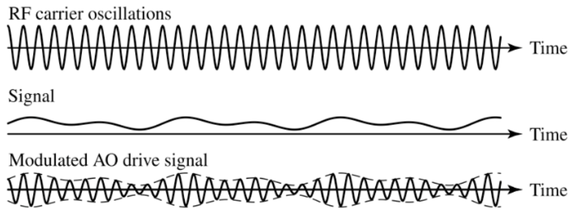
Acoustic Frequency

The operation of an acousto-optic modulator is based on the Bragg diffraction generated by an acoustic wave (traveling refractive grating) inside a crystal, as shown below. The **Acoustic Frequency** is fixed for each device. A RF voltage of the acoustic frequency is applied to the piezoelectric actuator attached to the crystal generating the acoustic wave. The higher the frequency, the higher the cost to make and higher the power consumption.



Modulation Bandwidth

An optical intensity modulator can be achieved by a driving circuity in which the acoustic intensity inside the crystal varies with an input modulation signal. A typical acoustic driver output is shown below: a **RF Input** electrical signal modulates the intensity profile of the carrier oscillations (acoustic frequency), resulting in a modulated driving signal, which leads to an output optical intensity similar to the RF input. The acoustic frequency intrinsically determines the rise/fall of the optical modulation. The **Modulation Bandwidth** is proportional to the acoustic frequency. The optical response can be optimized to certain extend via the driving circuit such as digital or analog.



Optical Wavelength Shift

Due to an energy exchange, all acoustic optical devices apply a frequency shift to the diffracted output beams. These optical wavelength shifts are very small and proportional to the acoustic frequency. Depending on the selected Bragg angle, these devices will either up-shift or down-shift the laser light by the frequency of the applied RF signal.