

Free Space Acousto-Optic Modulators/Shifter UV



244nm-1060nm, 3mm aperture, High Power 111MHz driving. Quartz

DATASHEET

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Features

- Low Loss
- Low Cost
- High Speed

Applications

- Fiber Lasers
- Pulse Picker
- Sensor

The AOMS series fiber optic acousto-optic modulators enable high-speed optical intensity modulation optimized for UV wavelengths. Built with high-purity quartz, they feature low insertion loss, a high UV damage threshold, and fast switching. When driven at the 111 MHz resonance frequency, the device satisfies the Bragg diffraction condition, deflecting light at a specific angle. Intensity is controlled by varying the RF drive amplitude (0–5 V via SMA input). The modulator inherently introduces a positive frequency shift, with negative shift versions available upon request. It operates over a narrow wavelength range, with the output angle dependent on the input wavelength. A matching driver is available.

The AOMS rise/fall time is directly related to the optical beam diameter, following the relation $\text{Rise Time} \approx D / v$, where D is the laser beam diameter in the acoustic propagation direction and v is the acoustic velocity in the AOM crystal. Therefore, reducing the beam size increases modulation speed and bandwidth.

The acousto-optic modulator utilizes a shear-mode interaction geometry, which provides efficient diffraction for both random and linearly polarized input light. The AOM design is in shear mode well suited for both random polarization and polarized.

Specifications

Parameter	Min	Typical	Max	Unit
Wavelength	244	260	500	nm
Interaction material	Crystal quartz			
Active Aperture		3.0		mm
RF frequency		111		MHz
Rise/Fall	5	20	30	ns
Modulation Bandwidth	10		50	MHz
AR coating		< 0.5		%
Transmission		> 97		%
Damage Threshold (@355nm)		> 100		MW/cm ²
Rise/Fall Time (Depends on beam diameter)		113		ns/mm
Acoustic mode	Longitudinal			
Polarization	Linear, vertical to base			
Diffraction efficiency		> 85		%
Separation angle (@244nm)		4.7		mrad
RF power		5		W
Input impedance		50		Ω
VSWR		< 1.2:1		
RF connector		SMA-F		
Cooling	Conduction-cooled			
Shell material	Aluminum alloy 6063			
Storage Temperature	-20		70	°C

Note: The specifications provided are for general applications with a cost-effective approach. If you need to narrow or expand the tolerance, coverage, limit, or qualifications, please [click this link](#):

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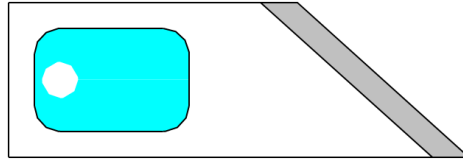
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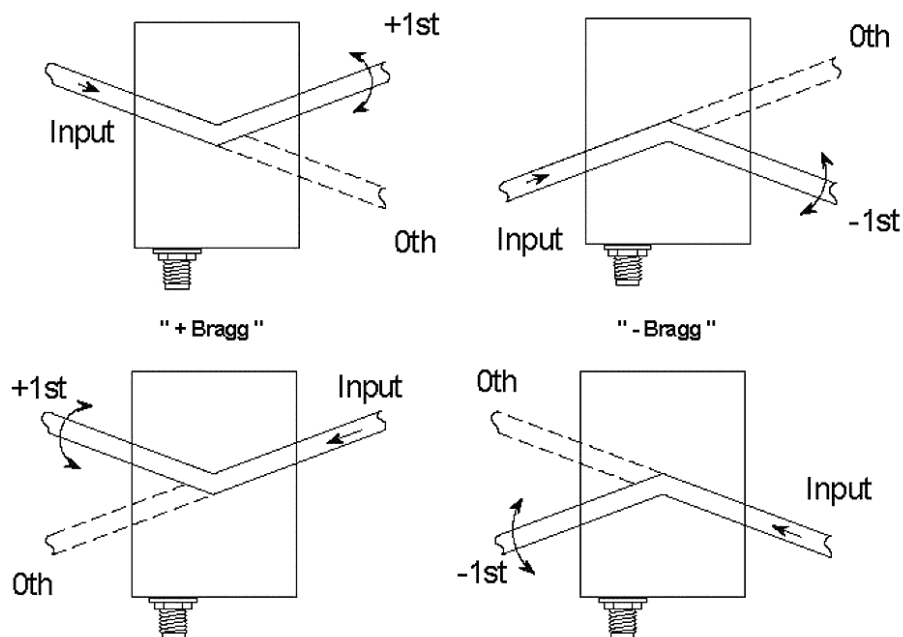
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Laser Beam Passthrough Arrangement



Typical AOM Aperture Geometry- Rectangle



Possible laser beam input and output arrangements

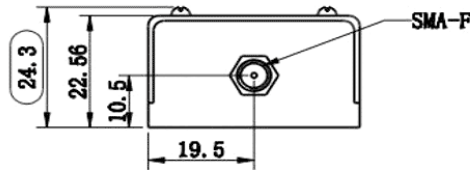
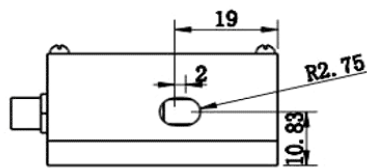
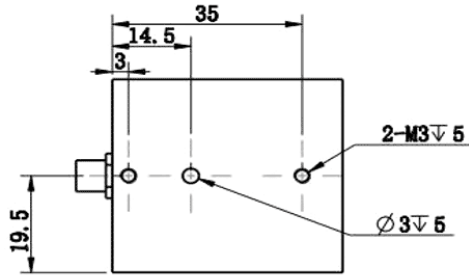
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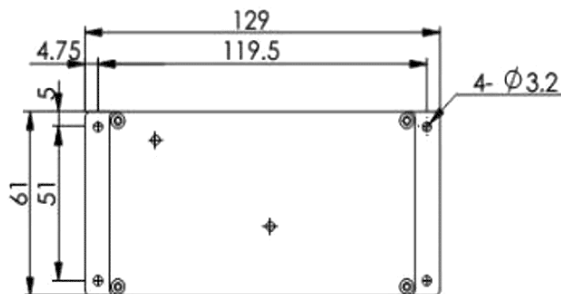
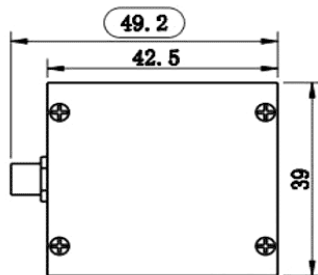
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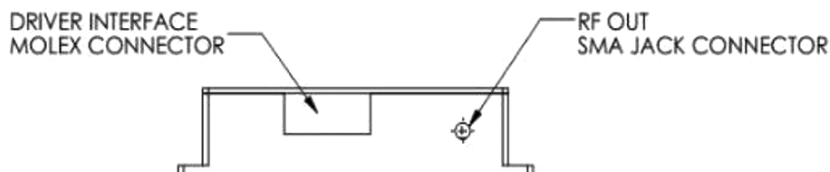
Mechanical Dimensions (mm)



AOM



AOM Driver



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

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Electrical Connection

Connect the device to the driver via the SMA connections

Ordering Information (Part Number)

	22	☐	☐	☐	☐	1
Prefix	Type	Wavelength	Aperture	Frequency	Driver	Polarization
AOMS-	TeO2 = 11 Quartz = 22 Special = 00	244-250nm = 2 300-350nm = 3 480-530nm = 5 1030-1610nm = 1 Special = 0	3mm = 3 2mm = 2 1.5mm = 1 Special = 0	111MHz = 1 200MHz = 2	No = 2 Yes = 1	Polarized = 1 Random = 2

Red means special order

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Q-switch Driver

The Driver is a medium-power acousto-optic Q-switch driver, with simple operation and high stability

Specifications

Parameter		Min	Typical	Max	Unit
RF frequency			111		MHz
Frequency stability			± 20		ppm/°C
Output Power ^[1]					W
VSWR				1.5/1	
Extinction ratio ^[2]		45	50		dB
Rise-time (10%-90%)			25	50	ns
Fall-time 90%-10%)			25	50	ns
Trigger frequency		DC		10	MHz
Harmonic Distortion				-20	dBc
Output impedance			50		Ω
Analog control		0		5	V
Logic		TTL_HIGH = RF_OUTPUT			
Digital control		Standard TTL (V_L<2.0V, V_H>3.0V)			
Connection	Input	D-SUB9 (Male)			
	Output	SMA-F			
Supply power		24V(DC), <3A ^[3]			
Cooling		Conduction-cooled			
Operating Temperature		10		50	°C

Note:

- [1]. The factory power is optimally debugged according to the supporting load
- [2]. Due to the limitation of test equipment, the test value will have a certain error
- [3]. The maximum voltage is 28V, exceeding it will cause irreversible damage;
12V, Compatible with 12V, but the output power will be reduced and the output efficiency will be worse

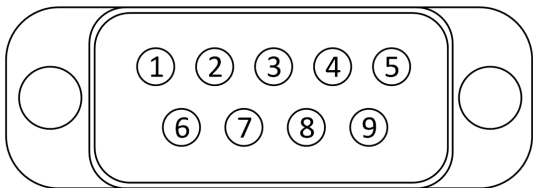
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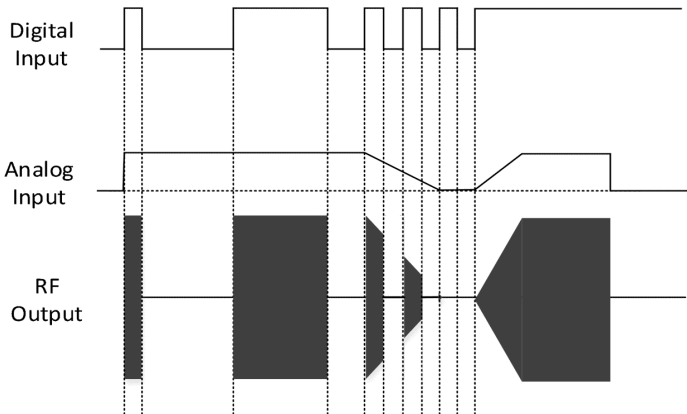
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Interface Description / Control Logic



Name	No.	Function
GND	1, 2, 6	GND
+24V	4, 5, 9	power
Digital	3	Digital control
Analog	8	Analog control



Operation Manual

1. Connect the driver to +24V using the provided cable but do not turn the power on.
Note: Applying the wrong polarity will burn the driver.
Note: Powering the driver without the load will damage the driver.
2. Connect the driver OUTPUT to the accustom-optic device via the two SMAs.
3. Turn on the +24V power
4. Input TTL control signal to the Modulation connection port