

Free-Space Electro-Optical Modulator

(3mm aperture, 3000nm to 2000nm, DC-MHz)



DATASHEET

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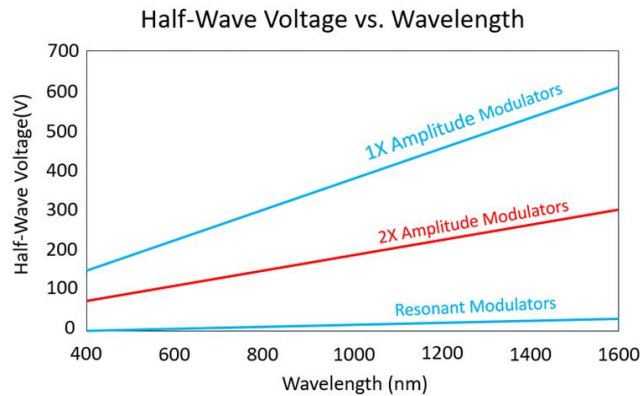
Features

- High Performance
- Compact Package
- Easy integration
- Customize Available
- Low cost

Applications

- Laser Modulation
- Holography
- Metal cutting/engraving
- Microfabrication

The FEOM Series Free-space Electro-Optic Modulator, supplied with a matched driver, modifies the polarization or amplitude of free-space laser beams across a wide wavelength range. It uses a compensated electro-optic crystal pair with specialized material compositions for high-power handling and short-wavelength stability. To lower the driving voltage, the modulator is offered in two configurations: single-pair and dual-pair crystal lengths, as shown in the accompanying graph. The device operates with alternating voltage to prevent internal charge buildup, while the matched driver supports modulation from DC to MHz, with depth limited by the driver's output power. Optional accessories include polarization cubes for high-extinction-ratio amplitude modulation and isolators to block back reflections. A polarized input beam is required for amplitude modulation.



Specifications

Parameter		Min	Typical	Max	Unit
Wavelength Range	W1	400		600	nm
	W2	600		900	
	W3	900		1250	
	W4	1250		1650	
Clear Aperture		3			mm
Halfwave Voltage, non-resonant		80		600	V
Extinction Ratio ^[1]		10	20	30	dB
Input impedance, resonant			50		ohms
Input capacitance, non-resonant			14		pF
Max Optical Power Density	532nm		2	10 ^[2]	W
	1064nm		5	20 ^[2]	W
Temperature		-20		50	°C

Notes:

[1]: Related to the polarizer and beam quality

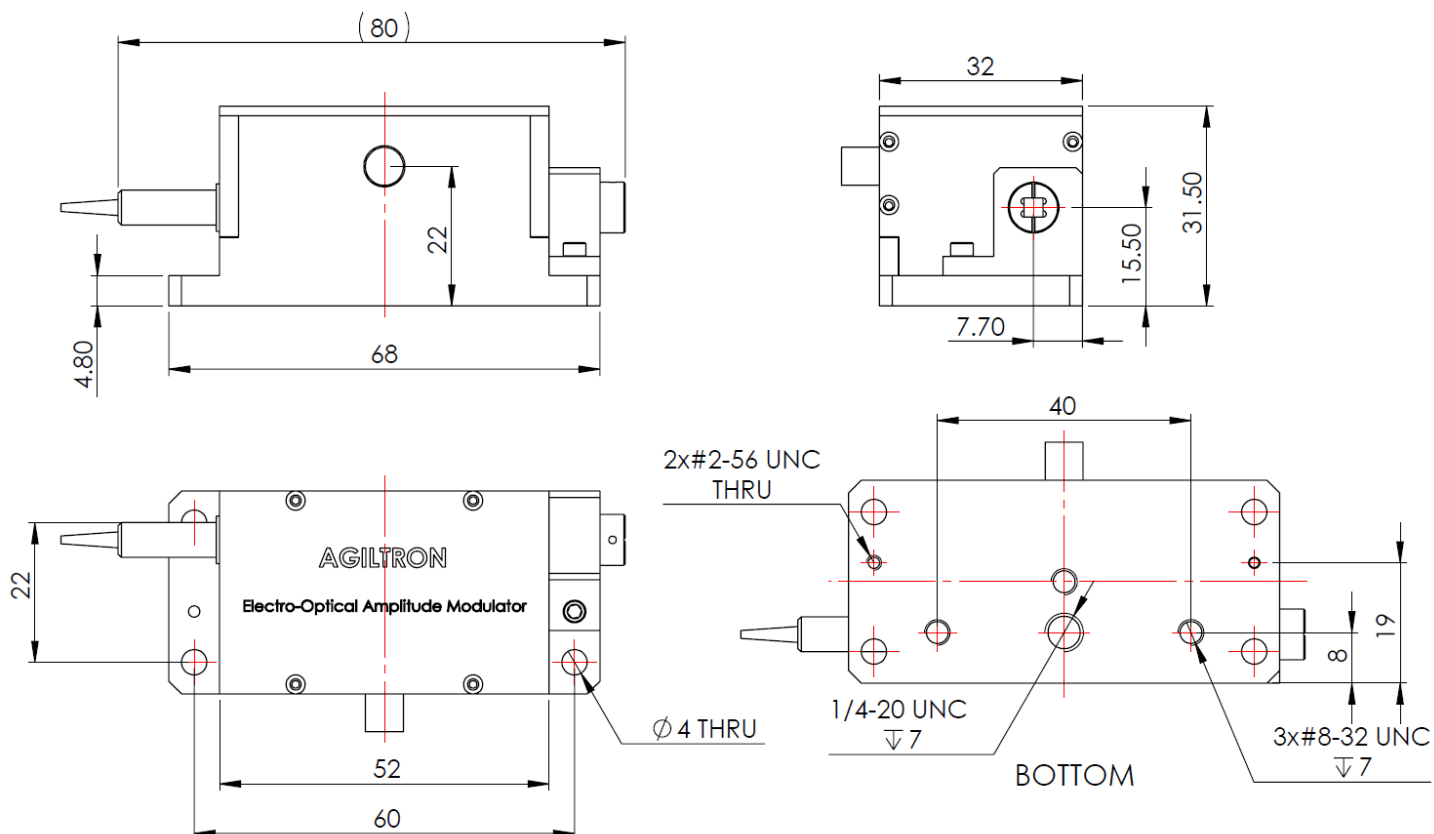
[2]: High power version available

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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Rev 07/11/25

Mechanical Drawing (mm) 1X



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

Operation Instructions

- 1. Input Alignment**
Direct the laser beam through the device, ensuring proper alignment along the optical axis without hitting the crystal walls.
- 2. Input Polarizer Setup**
Place a vertical polarizer at the input side. Adjust the input laser polarization direction to achieve maximum output intensity.
- 3. Output Polarizer Setup**
Place a horizontal polarizer at the output side of the device. Carefully adjust the orientation of the output polarizer to achieve minimum transmitted output intensity (extinction condition).
- 4. Apply Control Voltage**
Gradually apply voltage to the device and observe changes in the output intensity. At the operating voltage (V_p), the output intensity will reach its maximum.

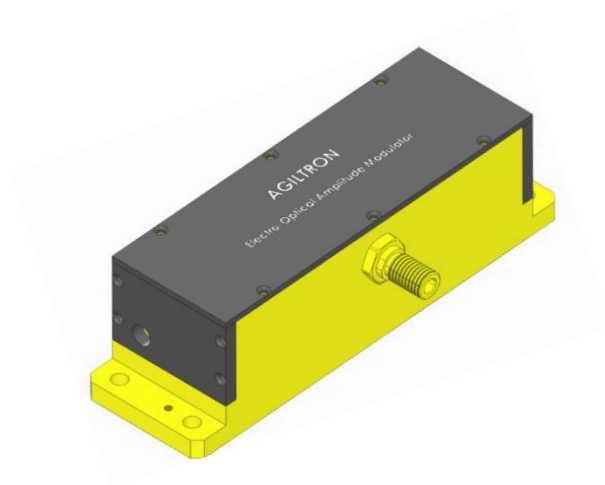
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Mechanical Drawing (mm) 2X



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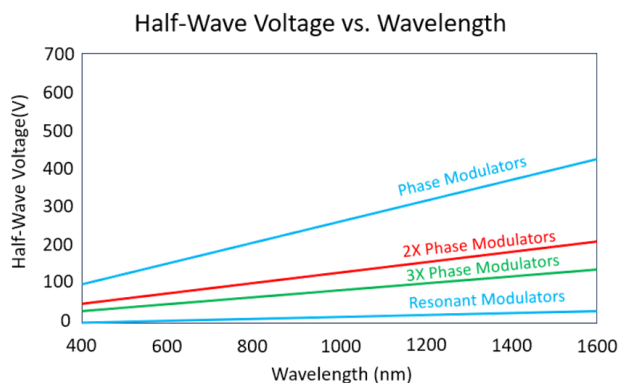
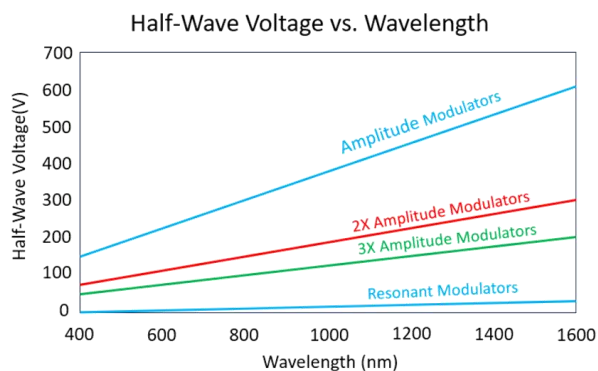
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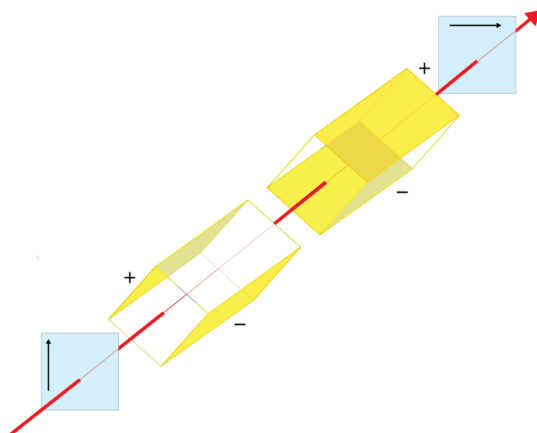


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Modulator Half-Wave Voltage



Amplitude Electro-Optic Crystal Configuration (yellow indicates electrode)



Typical Resonance Response (sine wave)



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Ordering Information

Prefix	Type	Wavelength	Optical Power	Crystal Length	Input Cube **	Output Cube **	Driver	Isolator
EOMN-	Amplitude = 5 Phase = 6	400~600 nm = 05 600~900 nm = 07 900~1250 nm = 09 1250~1650 nm = 14 320~500 nm = 03 1920-2400 nm = 20	Regular = 1 High Power = 2	1x = 1 2x = 2 3x = 3	No = 1 Polacore = 3 PBS = 4 Glan-Thompson = 5	No = 1 Polacore = 3 PBS = 4 Glan-Thompson = 5	Non = 1 Yes = 2	None = 1 One Stage = 2 Two Stage = 3
FEOM*								

* Old part number

** Polacore – CW 10W/cm²

PBS – CW 15W/cm²

Glan-Thompson – CW 2kW/cm²

Polarizer's prices:

Polacore	\$256
PBS	\$240
Glan Thompson	\$485

Polarizer

