

Resonant Free-Space Electro-Optical Modulator

(3mm aperture, 400nm to 2000nm, fixed frequency from 1 to 100MHz)



DATASHEET

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Applications

- Laser Modulation

Features

- Low loss
- Ease to use
- Low cost

The FEOM Free-Space Electro-Optic Modulator is a crystal-based resonant modulator engineered to operate at a fixed resonance frequency, allowing low-voltage drive for phase, polarization, or amplitude modulation of lasers. Resonance frequencies are selectable from 5 to 20 MHz. We offer both a standard version and a high-power version using RTP crystals to accommodate different application requirements. The standard unit uses a single crystal pair, while wavelengths above 1000 nm require two pairs to achieve full modulation depth. The design minimizes piezo-electric effects and charge buildup, producing the characteristic sinusoidal response of resonance-driven devices. For amplitude modulation, polarized input light is required because the modulation process depends on controlling intensity through the polarization state. With input and output polarizers, the device achieves a significantly enhanced extinction ratio (ER).

Specifications

Parameter		Min	Typical	Max	Unit
Wavelength Range	W1	400		600	nm
	W2	600		900	nm
	W3	900		1250	nm
	W4	1250		1650	nm
Halfwave Voltage @ non-resonance		225V @ 633nm			
Halfwave Voltage ^[1] , resonant		15V @ 633nm			
Extinction Ratio ^[2]		10			dB
Input impedance, resonant			50		ohms
Input capacitance @ non-resonance			14		pF
Aperture				3	mm
Max Optical Power Density ^[3]	Standard		2	4	W/mm ²
	High Power		1	500	MW/mm ²
Temperature		-20		50	°C

Notes:

- [1]. Maximum modulation depth or π phase shift voltage. The halfwave voltage increases as the wavelength increases.
- [2]. Characterized at 633nm.
- [3]. Wavelength dependent, typical is for 550nm, max is for 1060nm.

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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P +1 781-935-1200

E sales@agiltron.com

W www.agiltron.com

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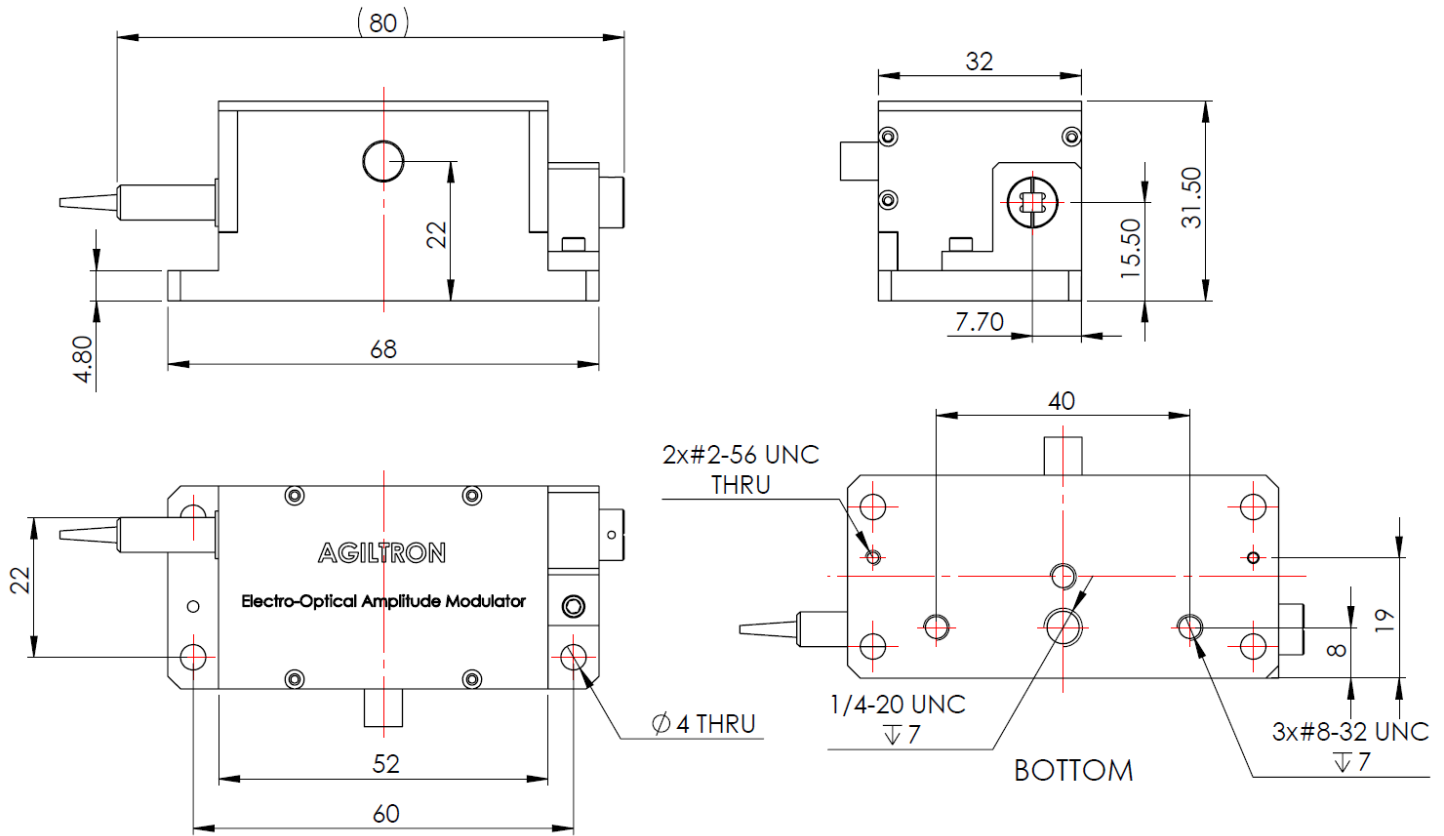
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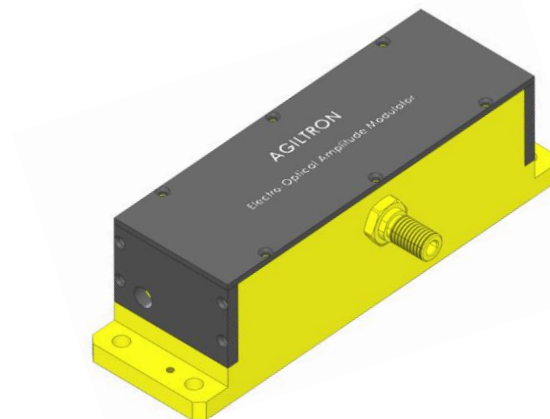


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Mechanical Drawing (1 pair)



Mechanical Drawing (2 pair)



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

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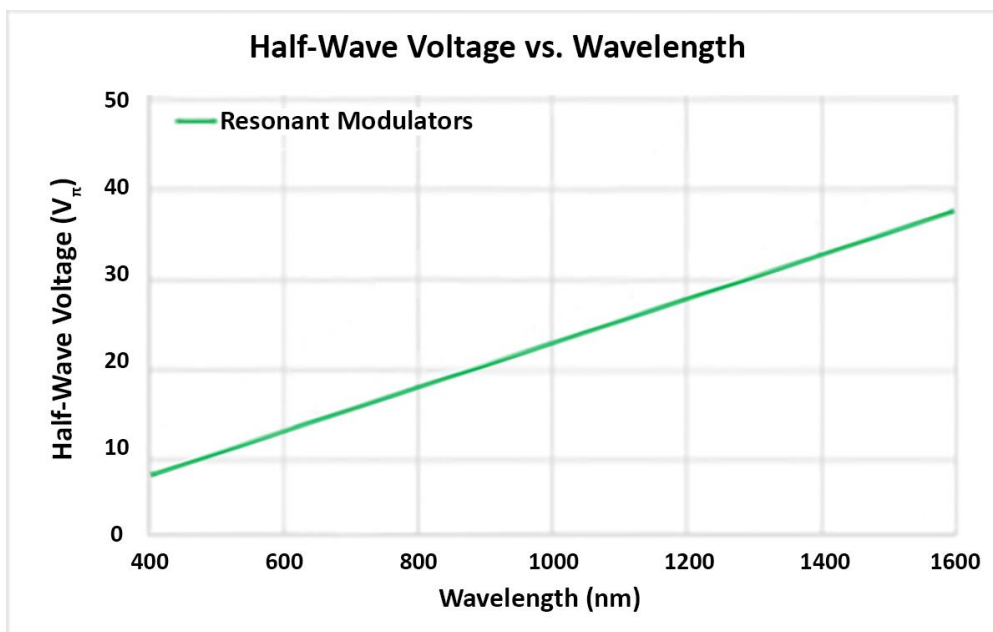
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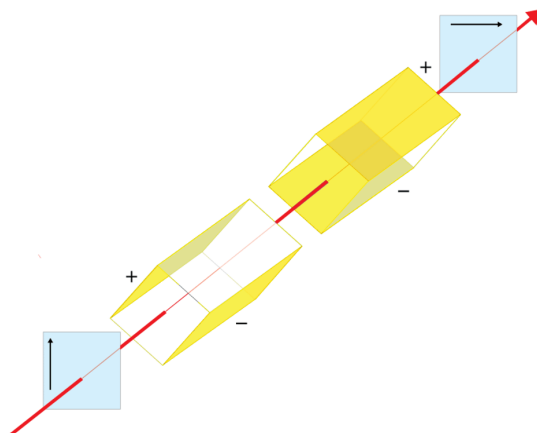


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Resonant Modulator Half-Wave Voltage



Amplitude Electro-Optic Crystal Configuration (yellow indicates electrode)



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Ordering Information (Part Number)

	☐	☐ ☐	☐	☐	☐	☐	F 1
Prefix	Type	Wavelength	Optical Power	Resonant frequency	Input Polarizer ^[1]	Output Polarizer ^[1]	
FEOM-	Amplitude = 1 Phase = 2	250~400nm = 03 400~600nm = 05 600~900nm = 07 900~1250nm = 10 1250~1650nm = 14	Regular = 1 2W = 2 5W = 5 10W = A 20W = B 50W = C 100W = D 300W = E	20 MHz = 2 5 MHz = 4 10 MHz = 1 30 MHz = 3 50 MHz = 5	No = 1 PBS = 4 Glan-Thompson = 5	No = 1 PBS = 4 Glan-Thompson = 5	Single resonant frequency version = F1

[1]. PBS – CW 15W/cm²
Glan-Thompson – CW 2kW/cm²

Polarizer's prices:

PBS	\$245
Glan Thompson	\$435

Polarizer



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