MODEL AGM-A1 HIGH FREQUENCY SERIES
IR ACOUSTO-OPTIC MODULATOR / FREQUENCY SHIFTER

- OPTICAL FREQUENCY SHIFTING
- INTENSITY MODULATION
- LASER BEAM DEFLECTION
- HIGH RELIABILITY

SPECIFICATIONS

Spectral Wavelength\(^1\) 10.6 µm
Acousto-optic Material Optical Single Crystal Geranium
Acoustic Velocity 5.5 mm / µsec
Active Aperture Height 3 mm
Modulation Bandwidth (-3db) 1.6 MHz (2.5 mm beam diameter)
Optical Rise Time 290 nsec (2.5 mm beam diameter)
RF Input Impedance 50 ohms
Optical Insertion Loss <7 percent
Optical Power Capability 25 watts full aperture
Laser Polarization Linear, parallel to mounting surface
Water Cooling 250 ml / min, 20\(^{\circ}\)C
Thermal Interlock Switch NC, opens at 45\(^{\circ}\)C
Size (less connectors) 3.00 D x 1.50 H x 1.30 W inches
76.2 D x 3.81 H x 33.0 W mm

MODEL | AGM-903A1 | AGM-1003A1 | AGM-1103A1
--- | --- | --- | ---
Center Frequency\(^2\) 90 MHz | 100 MHz | 110 MHz
Frequency Shift Range\(^2\) " (80 to 100) MHz | " (90 to 110) MHz | " (100 to 120) MHz
Beam Separation 173 mrad (90 MHz) | 192 mrad (100 MHz) | 212 mrad (110 MHz)
Bragg Angle 86.7 mrad (90 MHz) | 96 mrad (100 MHz) | 106 mrad (110 MHz)
Diffraction Efficiency 60 percent | 60 percent | 50 percent
RF Drive Power 20 watts | 20 watts | 20 watts

\(^1\) Narrow and broadband A/R coatings in the range of 2.2 µm to 11 µm are available.
\(^2\) Other frequencies available.
NOTE: Operating specifications change with optical wavelength.
**MODEL ATM-A1/A2 SERIES**

**ACOUSTO-OPTIC FREQUENCY SHIFTER**

- WIDE CENTER FREQUENCY CHOICE
- USER SPECIFIED CENTER FREQUENCY\(^1\)
- WIDE FREQUENCY SHIFTING RANGE
- HIGH DIFFRACTION EFFICIENCY
- BEAM DEFLECTION
- LOW DRIVE POWER
- HIGH RELIABILITY

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>ATM-A1 Series</th>
<th>ATM-A2 Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range of Center Frequency Choice(^1)</td>
<td>80 MHz - 350 MHz</td>
<td>80 MHz - 1100 nm</td>
</tr>
<tr>
<td>Frequency Shifting Bandwidth</td>
<td>50 percent of center frequency</td>
<td>80 percent (80 MHz)</td>
</tr>
<tr>
<td>Acousto-optic Material</td>
<td>Tellurium Dioxide (TeO(_2))</td>
<td>80 percent (350 MHz)</td>
</tr>
<tr>
<td>Active Aperture Height</td>
<td>1 mm</td>
<td>70 percent (350 MHz)</td>
</tr>
<tr>
<td>Sound Velocity (V)</td>
<td>4260 m/sec (longitudinal)</td>
<td>65 percent (350 MHz)</td>
</tr>
<tr>
<td>Beam Separation ((\frac{?}{F}) / V)</td>
<td>(151) nsec/mm beam diameter</td>
<td>(1.5:1) at center frequency</td>
</tr>
<tr>
<td>Optical Rise Time</td>
<td>(&lt;4) percent</td>
<td>(&lt;4) percent</td>
</tr>
<tr>
<td>Static Optical Insertion Loss</td>
<td>50 ohms</td>
<td>(&lt;4) percent</td>
</tr>
<tr>
<td>Input VSWR</td>
<td>(&lt;1.5:1) at center frequency</td>
<td>(&lt;1.5:1) at center frequency</td>
</tr>
<tr>
<td>Size (less SMA connector)</td>
<td>2.00 L x 0.63 H x 0.9 W inches</td>
<td>5.08 L x 1.60 H x 2.28 W cm</td>
</tr>
</tbody>
</table>

**MODEL**

<table>
<thead>
<tr>
<th>Optical Wavelength Range(^2) ((\lambda))</th>
<th>ATM-A1 Series</th>
<th>ATM-A2 Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>440 nm - 700 nm ((\lambda))</td>
<td>ATM-901A1</td>
<td>ATM-901A2</td>
</tr>
<tr>
<td>700 nm - 1100 nm ((\lambda))</td>
<td>ATM-2701A1</td>
<td>ATM-2701A2</td>
</tr>
</tbody>
</table>

1. Choose center frequency to match application.
2. Specifications vary with optical wavelength.
3. RF drive power required varies as the square of the optical wavelength.
4. A complete line of drive electronics is available. See VFE series, ME series, and DE series drivers. OEM drivers also available.
MODEL FCM SERIES
FIBER PIGTAILED
ACOUSTO-OPTIC MODULATOR / FREQUENCY SHIFTER

- NEAR IR WAVELENGTH RANGE
- OPTICAL FREQUENCY SHIFTING
- CHOICE OF FREQUENCY SHIFT
- INTENSITY MODULATION
- LOW RF DRIVE POWER
- HIGH RELIABILITY

SPECIFICATIONS

Acousto-optic Material
AMTIR-1 Chalcogenide Glass

Optical Fiber
Singlemode

Fiber Connector
FC-PC

Modulation Bandwidth (-3dB)
4.0 MHz

Optical Rise Time
120 nsec

Insertion Loss
< 2.0 dB

Extinction Ratio (On/Off)
> 55 dB

Optical Polarization
any

Input Impedance / VSWR
50 Ohms / 1.2:1

Size (less connectors)
2.24(5.7)D x 1.10(2.8)H x 2.29(5.82)W inches(cm)

MODEL FCM-401E6C

<table>
<thead>
<tr>
<th>RF Frequency</th>
<th>+ 40 MHz</th>
<th>+ 50 MHz</th>
<th>700 mWatts</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 MHz</td>
<td>50 MHz</td>
<td>80 MHz</td>
<td></td>
</tr>
<tr>
<td>50 MHz</td>
<td>80 MHz</td>
<td>100 MHz</td>
<td></td>
</tr>
</tbody>
</table>

MODEL FCM-501E6C

<table>
<thead>
<tr>
<th>RF Frequency</th>
<th>+ 40 MHz</th>
<th>+ 50 MHz</th>
<th>700 mWatts</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 MHz</td>
<td>80 MHz</td>
<td>100 MHz</td>
<td></td>
</tr>
<tr>
<td>80 MHz</td>
<td>100 MHz</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MODEL FCM-801E6C

<table>
<thead>
<tr>
<th>RF Frequency</th>
<th>+ 40 MHz</th>
<th>+ 50 MHz</th>
<th>700 mWatts</th>
</tr>
</thead>
<tbody>
<tr>
<td>80 MHz</td>
<td>100 MHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 MHz</td>
<td>200 MHz</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MODEL FCM-1001E6C

<table>
<thead>
<tr>
<th>RF Frequency</th>
<th>+ 40 MHz</th>
<th>+ 50 MHz</th>
<th>1.0 Watt</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 MHz</td>
<td>200 MHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>200 MHz</td>
<td>400 MHz</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Other optical fiber such as polarization maintaining, and other connectors such as FC-APC are also available.
2. Does not include connector losses.
3. User defined frequencies available from 40 MHz to 250 MHz. Note: Specifications change with frequency.
4. Negative frequency shift available. Specify when ordering.
5. Single frequency or phase locked dual frequency, laboratory, or OEM drivers are available. High extinction drivers also available.