Small Form-Factor Pluggable (SFP)
etMEMSTM Variable Optical Attenuator
(US patent 8,666,218 and other patents pending)

Product Description

Agiltron’s etMEMSTM Series SFP VOA is based on a proprietary micro-electro-mechanical mechanism featuring compact design, simple construction, easy direct drive, and excellent optical performance. The SFP VOA integrates a single channel VOA and tap power monitor into MSA compliant compact SFP form factor and provides I2C communication interface for easy system integration.

The device has a built-in firmware that linearizing the attenuation to the control signal. The power tap provides a digital warning when the output optical signal level below certain level. Either normally-open or normally-closed configurations are available.

Performance Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min</th>
<th>Typical</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wavelength</td>
<td>1310±50 / 1480±50 / 1550±50</td>
<td>nm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insertion Loss</td>
<td>1</td>
<td>1.5</td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Attenuation Range</td>
<td>25</td>
<td>30</td>
<td>1.5</td>
<td>dB</td>
</tr>
<tr>
<td>Polarization Dependent Loss @10dB</td>
<td>0.15</td>
<td>0.3</td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Polarization Dependent Loss @20dB</td>
<td>0.3</td>
<td>0.5</td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Wavelength Dependent Loss @10dB</td>
<td>0.3</td>
<td>0.5</td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Wavelength Dependent Loss @20dB</td>
<td>0.7</td>
<td>1.2</td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Attenuation Accuracy @20dB</td>
<td>0.5</td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Attenuation Resolution</td>
<td>0.1</td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Polarization Mode Dispersion</td>
<td>0.01</td>
<td>0.05</td>
<td></td>
<td>ps</td>
</tr>
<tr>
<td>Return Loss</td>
<td>40</td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Response Time</td>
<td>5</td>
<td>10</td>
<td></td>
<td>ms</td>
</tr>
<tr>
<td>Power consumption2</td>
<td>140</td>
<td>200</td>
<td></td>
<td>mW</td>
</tr>
<tr>
<td>Optical Power Handling</td>
<td>300</td>
<td>500</td>
<td></td>
<td>mW</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-5</td>
<td>75</td>
<td></td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40</td>
<td>85</td>
<td></td>
<td>°C</td>
</tr>
<tr>
<td>Package Dimension</td>
<td>SFP</td>
<td></td>
<td></td>
<td>mm</td>
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</tbody>
</table>

Notes:
1. Include both input and output connectors

Applications
- Power Control
- Power Regulate
- Instrumentation
Small Form-Factor Pluggable (SFP) etMEMS™ Variable Optical Attenuator

**Mechanical Footprint Dimensions (mm)**

![Footprint Diagram]

All Pin diameter = .45mm

**Electrical Pin Assignment**

The electrical pad layout is defined as below per the MSA agreement

<table>
<thead>
<tr>
<th>Pin</th>
<th>Top of Board (label Side)</th>
<th>Bottom of Board (as viewed thru top of the board)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>GND</td>
<td>GND</td>
</tr>
<tr>
<td>19</td>
<td>N/C</td>
<td>Fault Alarm</td>
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<tr>
<td>18</td>
<td>N/C</td>
<td>Optical Shutter Mode</td>
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<tr>
<td>17</td>
<td>GND</td>
<td>Serial Data</td>
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<tr>
<td>16</td>
<td>3.3V Power</td>
<td>Serial Clock</td>
</tr>
<tr>
<td>15</td>
<td>3.3V Power</td>
<td>GND</td>
</tr>
<tr>
<td>14</td>
<td>GND</td>
<td>N/C</td>
</tr>
<tr>
<td>13</td>
<td>N/C</td>
<td>Loss of Output Power Alarm</td>
</tr>
<tr>
<td>12</td>
<td>N/C</td>
<td>GND</td>
</tr>
<tr>
<td>11</td>
<td>GND</td>
<td>GND</td>
</tr>
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</table>
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Typical Performance Chart

Actual Attenuation vs digital setting within operating temperature

Ordering Information

<table>
<thead>
<tr>
<th>SFOA-</th>
<th>Type</th>
<th>Wavelength</th>
<th>Off State</th>
<th>Mode</th>
<th>Fiber</th>
<th>FiberLength</th>
<th>Connector</th>
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<tr>
<td></td>
<td></td>
<td>1310=3</td>
<td>1550=5</td>
<td></td>
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<td></td>
<td></td>
<td>1950=5</td>
<td>C+L=2</td>
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<tr>
<td></td>
<td></td>
<td>1260-1620=8</td>
<td>Special = 0</td>
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<tr>
<td></td>
<td></td>
<td>Transparent=1</td>
<td></td>
<td></td>
<td>None = 0</td>
<td>SMF=1</td>
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<tr>
<td></td>
<td></td>
<td>Multimode=2</td>
<td></td>
<td></td>
<td>MMF=2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.05M=5</td>
<td>0.1M=1</td>
<td>LC/PC = 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.2M=2</td>
<td>0.3M=3</td>
<td>Special = 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.4M=4</td>
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