

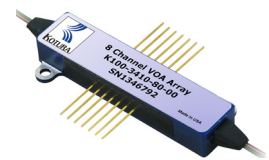
UltraVOA™ 4/8 Channel Array

Mellanox's UltraVOA™ Array uses silicon photonics to deliver reliable solid-state current controlled optical attenuation enabling ultra-fast control of signal levels in optical networks. The Variable Optical Attenuator (VOA) consists of a reliable silicon p-i-n diode structures built across a silicon optical waveguides. As current is applied through the diodes, the free carriers in each waveguide absorb photons, creating a current-controlled variable attenuation.

Because the physical effect is based on electronic control, the response time of the VOA is fast—less than 1 μ s in typical situations. This VOA is well suited to the most demanding applications in metro and long-haul transmission applications. The high speed of these VOAs makes them particularly useful for optical transient suppression, optical channel blocking and analog signal modulation applications.

Table 1 - Optical Specifications

| Specification | Units | Min | Typical | Max | Notes |
|--------------------------------------|---------|-------|---------|------|---|
| Operating Wavelengths | nm | 1525 | | 1568 | |
| Insertion Loss | dB | | 1.68 | 2.0 | Without connectors |
| Maximum Attenuation | dB | 40 | | | Blocking state |
| Operational Attenuation | dB | 0 | | 20 | Default attenuation is 0 dB at no applied current |
| Response Time (0-40 dB) | μ s | | 0.5 | 1.0 | 10-90% step response |
| PDL | dB | | | 0.54 | 0-25 dB attenuation |
| Wavelength Dependence of Attenuation | dB | | | 1.0 | At 10 dB attenuation |
| Optical Return Loss | dB | 40 | | | |
| Optical Cross-Talk | dBc | | | -50 | Channel to channel |
| Chromatic Dispersion | ps/nm | -0.05 | | 0.05 | 0 dB attenuation |
| PMD | ps | | 0.1 | 0.2 | 0 dB attenuation |
| Optical Input Power/Ch | dBm | | | 20 | |
| Attenuation Stability | dB | -0.25 | | 0.25 | Constant temperature and wavelength over 1 hour |

HIGHLIGHTS

KEY FEATURES

- High Speed <1 μ s
- Wide attenuation range >40 dB
- All solid state operation
- 4 and 8 channel array
- Compact package

APPLICATIONS

- Channel power equalization and blocking
- Optical transient suppression
- Analog signal modulation
- Power control in WDM and configurable networks

COMPLIANCE

- Telcordia Qualified
- RoHS 6/6

Table 2 - Electrical Specifications

| Specification | Units | Min | Typical | Max | Notes |
|--------------------------------|-------|-----|---------|-----|-------------------------------|
| TEC Supply Current | A | | | 1.0 | |
| TEC Supply Voltage | V | | | 3.5 | |
| Recommended TEC Setting | °C | | 70 | | For optimal attenuation range |
| Thermistor Resistance at 70 °C | kΩ | | 1.751 | | NTC Z-curve 10kΩ thermistor |
| Operating Current | mA | | 40 | 45 | At 40 dB attenuation |
| Forward Voltage | V | | | 4.5 | At 40 dB attenuation |

Table 3 - Environmental Specifications

| Specification | Units | Min | Typical | Max | Notes |
|-----------------------------|-------|-----|---------|-----|------------------|
| Operating Temperature | °C | 0 | | 70 | Case temperature |
| Storage Temperature | °C | -40 | | 85 | Ambient |
| Operating Relative Humidity | % | | | 85 | |

Table 4 - Absolute Maximum Ratings (limited duration)

| Specification | Units | Min | Typical | Max | Notes |
|-------------------------------------|-------|-----|---------|-----|----------------------|
| Optical Input Power/Ch | dBm | | | 20 | Single Channel Limit |
| Electrical Power Dissipation (8 Ch) | W | | | 1.6 | All Channels |
| Electrical Power Dissipation (4 Ch) | mW | | | 800 | All Channels |
| Current/Ch | mA | | | 80 | |
| Reverse Bias Voltage | V | | | 20 | |

Table 5 - Electrical PIN Connections

| PIN | 8 Channel | | 4 Channel | |
|-----|-----------|----------------|-----------|-------------------|
| | Name | Description | Name | Description |
| 1 | TEC- | TEC- driver | TEC- | TEC- driver |
| 2 | AN+ | Anode (common) | Ch3+ | Channel 3 Anode |
| 3 | N/C | No Connection | Ch4+ | Channel 4 Anode |
| 4 | Ch 8- | CH8 Cathode | N/C | Not Connected |
| 5 | Ch 7- | CH7 Cathode | N/C | Not Connected |
| 6 | Ch 6- | CH6 Cathode | Ch4- | Channel 4 Cathode |
| 7 | Ch 5- | CH5 Cathode | Ch3- | Channel 3 Cathode |
| 8 | Ch 4- | CH4 Cathode | Ch2- | Channel 2 Cathode |
| 9 | Ch 3- | CH3 Cathode | Ch1- | Channel 1 Cathode |
| 10 | Ch 2- | CH2 Cathode | TH | Thermistor |
| 11 | Ch 1- | CH1 Cathode | TH | Thermistor |
| 12 | TH | Thermistor | Ch1+ | Channel 1 Anode |
| 13 | TH | Thermistor | Ch2+ | Channel 2 Anode |
| 14 | TEC+ | TEC+ driver | TEC+ | TEC+ driver |

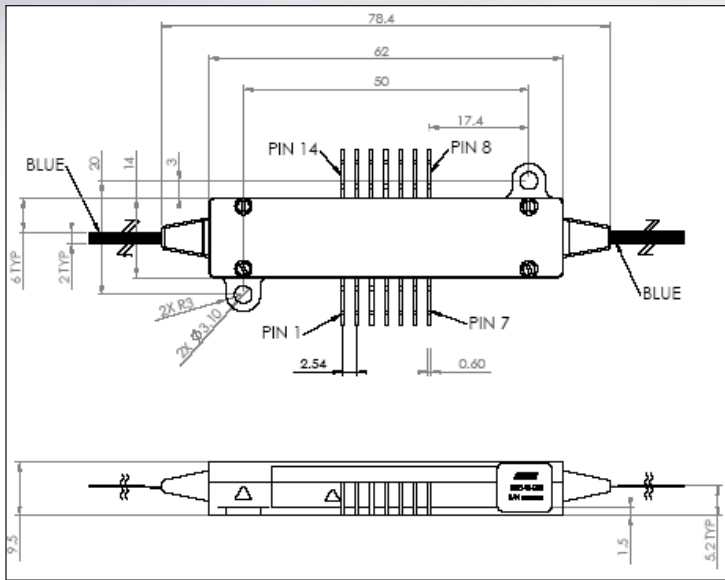


Figure 1. Package Outline Drawing

Table 6 - Ribbon Fiber Color Code

| Ribbon Closest To Pins 1/14 | Ribbon Closest To Pins 7/8 | 4-Channel | 8-Channel |
|-----------------------------|----------------------------|-----------|-----------|
| Blue | Black | N/C | Ch1 |
| Orange | Red | N/C | Ch2 |
| Green | White | Ch1 | Ch3 |
| Brown | Slate | Ch2 | Ch4 |
| Slate | Brown | Ch3 | Ch5 |
| White | Green | Ch4 | Ch6 |
| Red | Orange | N/C | Ch7 |
| Black | Blue | N/C | Ch8 |

Package Style Options

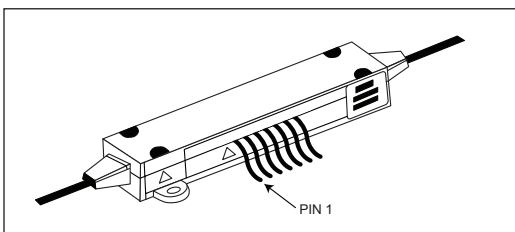


Figure 2. Package version with formed leads

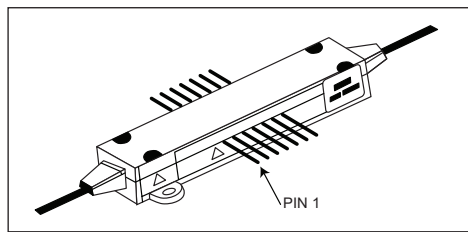


Figure 3. Package version with straight leads

Package Dimension

Length: 62mm

Width: 14mm

Height: 9.5mm

Fiber Length

Default fiber length is 1 meter each side unless otherwise specified

Fiber Type

SMF 28E Ribbon Fiber

| Ordering Part Number | Description |
|----------------------|---|
| K100-3310-10-00 | VOA, 4ch, straight leads, ribbon fiber, N/C |
| K100-3310-11-NN | VOA, 4ch, straight leads, individual fiber breakout with connectors |
| K100-3311-10-00 | VOA, 4ch, formed leads, ribbon fiber, N/C |
| K100-3311-11-NN | VOA, 4ch, formed leads, individual fiber breakout with connectors |
| K100-3410-10-00 | VOA, 8ch, straight leads, ribbon fiber, N/C |
| K100-3410-11-NN | VOA, 8ch, straight leads, individual fiber breakout with connectors |
| K100-3411-10-00 | VOA, 8ch, formed leads, ribbon fiber, N/C |
| K100-3411-11-NN | VOA, 8ch, formed leads, individual fiber breakout with connectors |

| Connector Type | NN |
|----------------|----|
| LC/UPC | 11 |
| LC/APC | 15 |
| FC/UPC | 21 |
| FC/APC | 25 |
| SC-UPC | 41 |
| SC-APC | 45 |



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