

Lightvision

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Liquid Crystal

– a novel approach to control light-waves

Lightwaves2020's liquid crystal based Variable Optical Attenuator (LC-VOA) is based on our proprietary liquid crystal (LC) technology and Laser welding package technology, which features AC voltage controlled, no-moving parts and low power consumption.

With laser welding process, the LC cell and optics are sealed in a compact coaxial package of ϕ 7.2mm in diameter, which makes this small footprint ideal for integration onto circuit board.

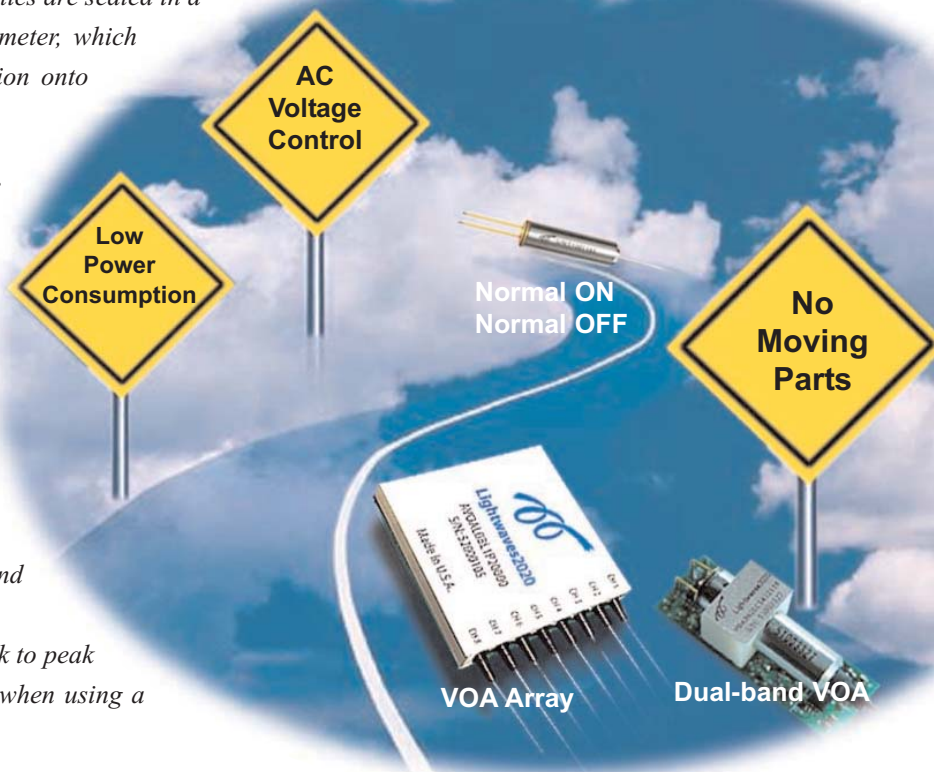
The LC cell, acting as a variable phase retarder, changes the phase of incoming optical wave while AC voltage is applied on the cell. This phase shift results in variation of optical coupling efficiency, which eventually causes optical attenuation. By the principle, the attenuation is just the result of optical phase shift other than movement of any mechanical parts.

The LC-VOA can sustain office vibration and mechanical shock.

The LC-VOA is driven by either a 0 ~ 30V peak to peak 10 KHz square wave or a 0 – 5V DC signal when using a Lightwaves2020's driver:

In addition, it offers the benefits of continuous attenuation control without backlash, high attenuation of more than 30 dB, low driving voltage, excellent PDL, low insertion loss, precision attenuation control without backlash, wide operating wavelength range covering S-, C- or L- band.

The LC-VOA can be used for pre-emphasis of signals of DWDM lasers in long haul systems, power equalization in optical add/drop modules and optical cross-connects, as well as gain-tilt adjustment in erbium-doped fiber amplifiers. The VOA is designed and built to meet Telcordia standard.



- Normal ON
- Normal OFF
- Dual-band VOA
- VOA Arrays

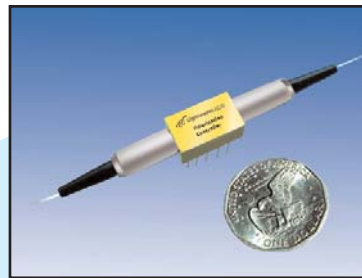
Applications

- Channel balancing in optical networks such as DWDM systems (pre-emphasis)
- Power equalization in optical add/drop modules and optical cross-connects
- Gain-tilt and power adjustment in EDFAs
- Receiver protection
- Instrumentation

Features

- Continuous tuning without moving parts
- Resistant to mechanical vibration
- Low PDL and WDL
- Wide Operating wavelength range
- Slow tuning slope without backlash and hysteresis
- Voltage driving with low power consumption
- Laser welded package for maximum reliability
- High power sustainable
- Small footprint in coaxial package
- Simple device structure with high manufacturing yield
- Semi-automatic fabrication process
- Low cost at both small and large volume
- GR-1221 compliant

Other Liquid Crystal Products



1) Liquid Crystal Polarization Controller

Features

- No moving parts
- Wide operating wavelength range
- High extinction ratio
- Low insertion loss
- Low PDL and low PMD
- Low power consumption

Applications

- PMD compensator
- Polarization generator
- Polarization multiplexer
- Polarization scramblers
- Polarization instrumentation



2) Phase Retarder

Features

- No moving parts
- Very compact size
- Wide operating wavelength range
- High extinction ratio
- Low insertion loss
- Low PDL and low PMD
- Low return loss
- Low power consumption

Applications

- Tunable waveplate
- As a shutter in tunable lasers
- As an VOA in tunable lasers to obtain variable optical output
- Polarization instrumentation

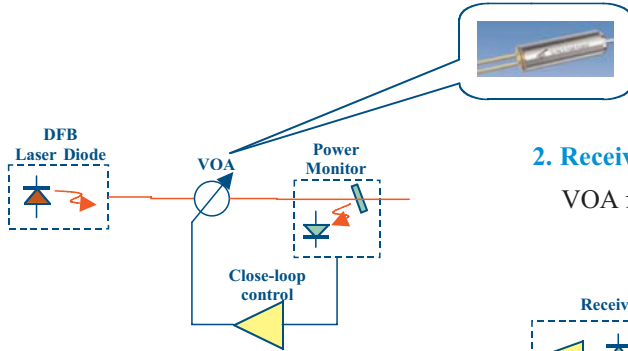
Telcordia Compliance
RoHS Compliance

Application Examples



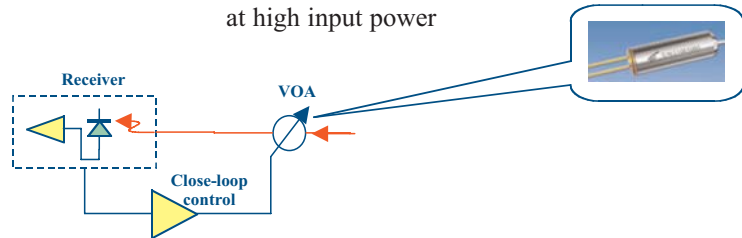
1. WDM Transmission Line Card

VOA Function: regulate line card output power



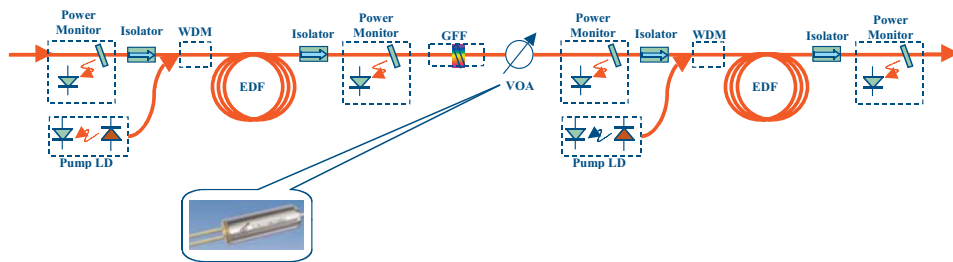
2. Receiver Line Card

VOA function: protect receiver from situation at high input power



3. In Gain Configurable EDFAs

VOA Function: adjust mid-stage loss to tune gain tilt



4. Optical Power Attenuation Instruments

VOA Function: adjust loss



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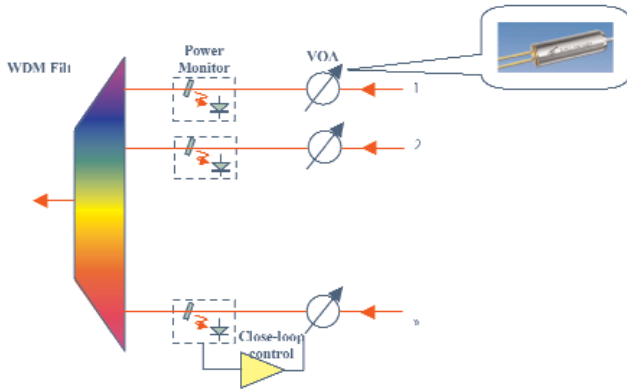
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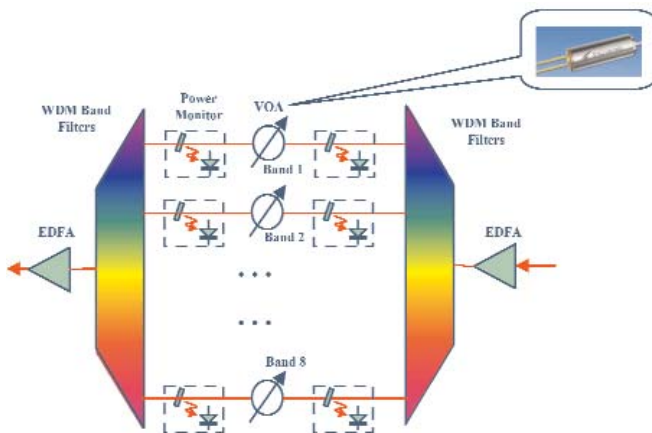
5. WDM Mux/DeMux and OADM

VOA function: balance channel power



6. Band Based Optical Amplifier Gain Equalizer

VOA function: adjust band loss



We released several new products recently

- 1) Mini Polarimeter: it is a great product for 40 G PMDC applications.
- 2) Thin film tunable filter, manual or motor control.
- 3) Tunable ASE based laser source, stable and low cost

Products under development and will be released soon:

- 1) Optical Channel Monitor: high performance low cost, and multi-port monitoring capability.
- 2) High-speed polarization controller, with speed in ms range.
- 3) Multiple Channel DWDM Light Source

In addition, our optical coating is continuing to supply high quality high performance optical thin film filters to the fiber optical communications industry. Products include GFF, CWDM, DWDM, x-skip-y filters, ..., and custom-made filters for the demanding applications.

For more product information, please visit our website at www.lightwaves2020.com



*We love to hear from you!
Please kindly email your feedback to
sales@lightwaves2020.com*

About Lightwaves2020 Inc.

Founded in 1997 with its headquarter in Milpitas, CA, US., Lightwaves2020 Inc. designs, manufactures, markets advanced optical components and test & measurement instruments for the commercial and defense industries.



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