



Summary

Most fiber-optic switches are addressed and function digitally. We have developed an Analog Fiber-Optic Switch (AFOS) having the favorable attributes of both wavelength and fiber type independence, a measured extinction ratio of 80 dB or more, low insertion loss, simple construction and low cost. In addition, our realization of AFOS provides analog modes of operation and may serve as an electronically controlled variable optical attenuator as well as functioning as an external analog or digital modulator.

Applications

- Our realization of AFOS provides analog modes of operation and may serve as an electronically controlled variable optical attenuator as well as functioning as an external analog or digital modulator.

Advantages

- This switch has both wavelength and fiber type independence, a measured extinction ratio of 80 dB or more, low insertion loss, simple construction and low cost.
- Ideally, the fiber-optic switches that are employed would be wave-length independent and compatible with such SM systems. Unlike most switches, ours is!

The Technology

Most fiber-optic systems employ a Dense Wavelength Division Multiplexing (DWDM) scheme, sending information over single mode (SM) fibers. The AFOS is constructed with a multimode fiber spliced between two SM fibers used as modal filters. When the multimode fiber is subjected to a periodic strain field, light leaks out of the fiber, reducing the propagating light. The modal filters enhance the resulting extinction ratio. Our AFOS has a combination of distinct advantages not found in any other single device. The AFOS was optimized and characterized for use as a continuously variable attenuator and as an optical switch/modulator. The AFOS is wavelength independent over the SM wavelength bands, is simple in construction and has a measured extinction ratio of more than 80 db. Optimization of the device and design for manufacturability are the next steps in the device development.

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