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80-Channel Multiplexer-Demultiplexer Module for DWDM Communications using Hybrid AWG -- Interleaver Technology

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Aside from the more traditional data, voice and e-mail communications, new bandwidth intensive applications in the larger consumer markets, such as music, digital pictures and movies, have led to an explosive increase in the demand for transmission capacity for optical communications networks. This has resulted in a widespread deployment of Dense Wavelength Division Multiplexing (DWDM) as a means of increasing the communications capacity by multiplexing and transmitting signals of different wavelengths (establishing multiple communication channels) through a single strand of fiber. We report on the design, assembly and characterization of a 50-GHz, 80-channel Mux-Demux module for DWDM systems. The module has been assembled from two commercially available 100 GHz, 40-channel Array Waveguide Grating (AWG) modules and a 50-GHz to 100-GHz interleaver. Relevant performance parameters such as insertion loss, channel uniformity, next-channel isolation (crosstalk) and integrated cross-talk are presented and discussed in contrast with the performance of other competing technologies such as Thin-Film-Filter-based Mux-Demux devices.

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