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Design of arrayed waveguide grating (AWG) demultiplexer based PMMA for narrow channel spacing

Abstract

Arrayed Waveguide Grating (AWG) based PMMA polymer that functioning as multiplexer/demultiplexer (mux/de-mux) having good potential in WDM system and interferometer optical sensor. Besides, AWG is suitable for larger count optical signals and good filter response devices. AWG demultiplexer based polymer was simulated using Beam Propagation Method (BPM) under TE mode with 1550 nm central wavelength. This work explores the performance of polymer-based AWG with straight waveguide structure that capable to produce 16-channels AWG device for 100 GHz (0.8 nm) channel spacing. The 16-channels AWG based polymer produces low insertion loss of 3.430 dB and low crosstalk of -24.763 dB. The central wavelength for each output port gives almost similar values with the standard ITU-T DWDM wavelength grid with the smallest difference of 0.5 nm. This proposed device also capable to solve the demand on higher channel capacity especially to support internet usage and the needs of the best communication system.