

4-channel Double S-shaped AWG Demultiplexer on SOI for CWDM

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Abstract— We demonstrate the design, fabrication and characterization of silicon-on-insulator (SOI)-based Arrayed Waveguide Grating (AWG) with broad channel spacing of 20 nm (~2500 GHz) which has a unique double S-shaped pattern at the arrayed region. Beam propagation method (BPM) under TE polarization at a central wavelength of 2431GHz and Complementary-Metal Oxide Semiconductor (CMOS) technology are used to simulate and fabricate the AWG device with 340 nm thick top silicon (Si) guiding layer. Performance comparison of insertion loss and optical crosstalk between the simulated and fabricated AWG was discussed. SOI-based AWG is employed in the Coarse Wavelength Division Multiplexing (CWDM) system to investigate the functionality of the device at a system level as well as to analyse signal degradation using a bit-error rate (BER) analyzer when 10 Gb/s and 40 Gb/s data rates are applied.

Keyword— AWG; broad channel spacing; CMOS technology; CWDM system; SOI



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