Analysis of 3 dB Directional Coupler Based On Silicon-On-Insulator (SOI) Large Cross-Section Rib Waveguide

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Abstract : The 3 dB directional coupler is designed by using silicon-on-insulator (SOI) large cross-section and simulate by Beam Propagation Method at the communication wavelength of $1.55 \mu m$ and $1.48 \mu m$. The geometry is shaped with rib height (H) of 6 μm and varied in step factor (r) which is 0.5, 0.6, 0.7 and 0.8. The wave guide spacing is also fixed to 5 μm and the slab width is symmetrical. In general, the 3 dB coupling lengths for four different cross-sections are several millimetre long. The 1.48 of wavelength give the longer coupling length if compare to 1.55 at the same step factor (r). Besides, the low loss propagation is achieved with less than 2 % of propagation loss.

Keywords: 3 dB directional couplers, silicon-on-insulator, symmetrical rib waveguide, OptiBPM 9

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