Add-drop filter based on Shifted Bragg grating

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Introduction

In shifted Bragg grating (SBG), the features on either side of the waveguide are placed with half of a period longitudinal offset. A SBG along with asymmetric Y-junction, facilitate add-drop operation with consecutive mode conversion and mode selection at Bragg wavelength.

Working principle

Wavelengths launched through IN port excites the fundamental mode (TE₀) at the asymmetric Y-junction stem. Mode conversion (TE₀ to TE₁) occur at Bragg wavelength (λc) upon reflection from SBG which couple back into DROP port. λc can be added through the ADD port exciting the TE₁ mode which after mode conversion (TE₁ to TE₀) couples at THROUGH port.

Experimental results

3 dB bandwidth of the reflected signal at the converted mode in DROP port from a 300 µm long SBG is 2.2 nm which agrees the simulation. The extinction ratio ~14 dB and insertion loss due to the grating is < 2 dB.

References


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