Structure tuned, high transmission 180° waveguide bend in 2-D planar photonic crystal

Abstract

We present a high transmission, small bending radius, 180° waveguide bend based on triangular lattice air holes two-dimensional (2-D) planar photonic crystal. The desired high transmission is achieved by altering the waveguide structure at the bending region. Drop hole defects are introduced at the bending region to guide the incoming electromagnetic wave. Simulation results based on the 2-D finite difference time domain method show that normalized transmission as high as 99.4% is achieved at 1550 nm optical wavelength and it is >94% for nearly the entire optical C-band. In addition, the small bending radius enhances the suitability of our design to be used in ultra-compact photonic integrated circuits.

Keyword: Optical tuning; Optical waveguide; Photonic crystal; Photonic integrated circuits