

Y-Branch

Last Updated: August 2019

Description

50/50% 3dB splitter. Useful for splitting light, Mach-Zehner Interferometers, etc. The layout parameters for the device were taken from the journal paper below, and implemented in EBeam lithography.

Model Name

ebeam_y_1550

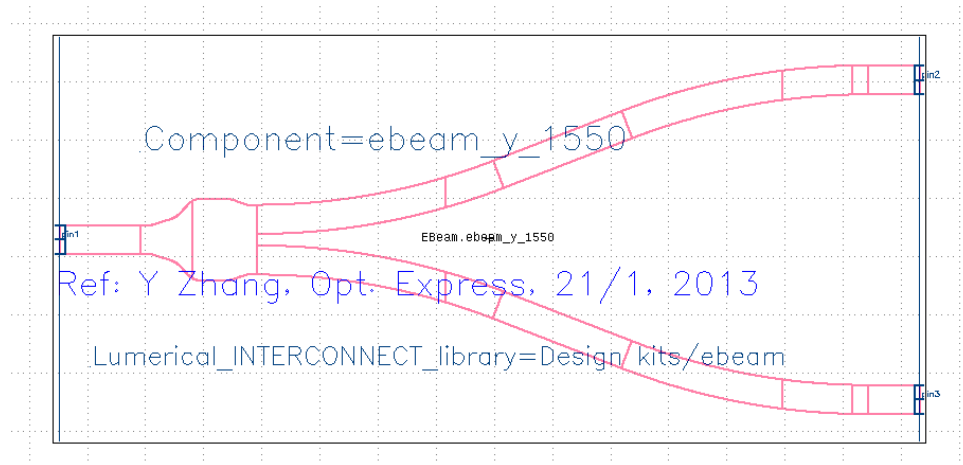


Fig. 1: Compact Model of Y-Branch

Compact Model Information

- Support for TE polarization
- Operating at 1550 nm wavelength
- Performance:
 - Excess Loss is < 1 dB

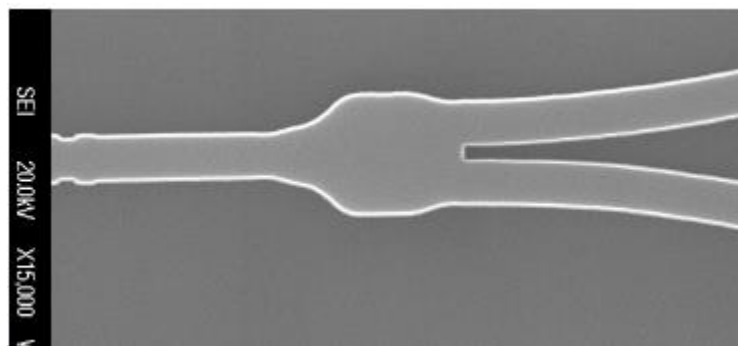


Fig. 2: SEM Picture of Y-Branch

Parameters

N/A

Simulation Results

From Y Zhang, et al., “A compact and low loss Y-junction for submicron silicon waveguide”:

- Transmission and reflection are wavelength insensitive

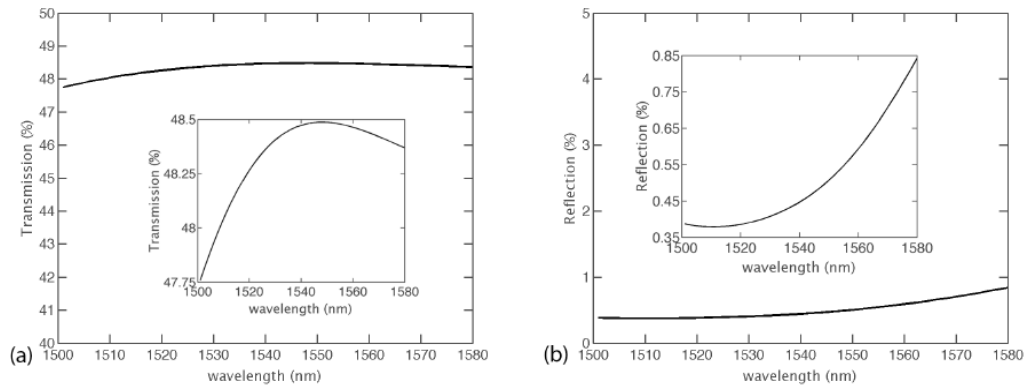


Fig. 2. Simulated (a) power transmission and (b) reflection as a function of wavelength, with zoomed-in view in the insets.

Fig. 3: Simulation Results

Experimental Results

From Y Zhang, et al., “A compact and low loss Y-junction for submicron silicon waveguide”:

- Insertion loss of 0.28 +/- 0.02 dB, uniform across an 8-inch wafer
- Output power and splitting ratio are uniform and wavelength insensitive

Additional Details

- Design Tools & Methodology: 2D & 3D FDTD (Lumerical Solutions)

Reference

1. Y Zhang, et al., “A compact and low loss Y-junction for submicron silicon waveguide”, Opt. Express, 21/1, pp. 1310-1316 (2013) <http://dx.doi.org/10.1364/OE.21.001310>