Broadband Directional Coupler

Last Updated: August 2019

Description

50/50% broadband directional 3-dB couplers. Two 3-dB couplers can be used to make an unbalanced Mach-Zehnder Interferometer (MZI), showing a large extinction ratio. The advantage of this device compared to the Y-Branch is that it has 2x2 ports, thus the MZI has two outputs. Compared to the directional coupler, it is less wavelength sensitive.

Model Name

ebeam_bdc_te1550

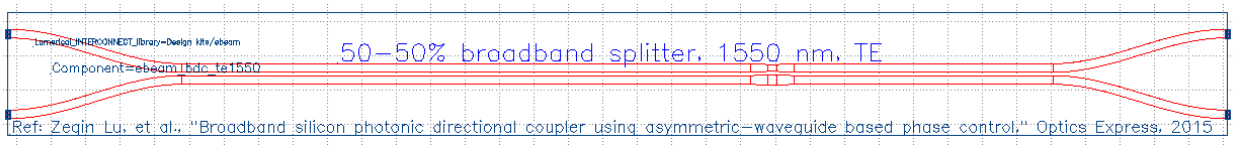

Fig. 1: Compact Model of a Broadband Directional Coupler

Compact Model Information

- Support for TE polarization
- Operating at 1550 wavelength
- Performance (Insertion Loss, 3dB Bandwidth):
  - TE – TBD
- Splitting ratio was extracted from the unbalanced MZI spectra.
- Excess loss negligible

[Insert SEM Picture & other relevant photos of model]

Fig. 2: SEM Picture of [Component_Name]

Parameters

N/A

Simulation Results

From [Source]:

[Insert Simulation Results]

Fig. 3: Simulation Results for [Insert_Details]

Experimental Results

From [Source]:

[Insert Experimental Results]

Fig. 4: Experimental Results for [Insert_Details]

Additional Details

- Design tools & methodology:
  - MATLAB
  - 3D-FDTD (Lumerical FDTD Solutions)
  - Eigenmode expansion propagator (MODE Solutions)

http://github.com/lukasc-ubc/SiEPIC_EBeam_PDK/

Reference

1. Zeqin Lu, Han Yun, Yun Wang, Zhitian Chen, Fan Zhang, Nicolas A. F. Jaeger, Lukas Chrostowski, "Broadband silicon photonic directional coupler using asymmetric-waveguide based phase control", Opt. Express, vol. 23, issue 3: OSA, pp. 3795--3808, 02/2015, http://www.opticsexpress.org/abstract.cfm?URI=oe-23-3-3795