



Integrated Reconfigurable Circulator

Tech ID: 25991 / UC Case 2016-319-0

BRIEF DESCRIPTION

Photonic integrated circuit (PIC) comprised of an integrated non-reciprocal device that can be reversed, is monolithic, and can be integrated with lasers and modulators

BACKGROUND

Non-reciprocal devices demonstrated to date have been relatively large, have had fixed functionality, and required complex fabrication to integrate permanent magnetic material. While there are many circulators available, none can be reversed. A reconfigurable circulator has never been proposed or demonstrated before.

DESCRIPTION

Researchers at UC Santa Barbara have created a photonic integrated circuit (PIC) comprised of an integrated non-reciprocal device that can be reversed, is monolithic, and can be integrated with lasers and modulators. This method takes an input from one port (#1) and sends it to the next port (#2) and so forth, until the last port (N) sends the signal to the first port (#1). The present invention enables integration of low-optical-loss non-reciprocal devices in a PIC in a simple, low-cost manner.

ADVANTAGES

- ▶ Reversible
- ▶ Reconfigurable
- ▶ Reduced cost

APPLICATIONS

- ▶ Can be integrated with lasers & modulators

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,016,317	05/25/2021	2016-319

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ [Bonding of Heterogeneous Material for Improved Yield and Performance of Photonic Integrated Circuits](#)

CONTACT

Pasquale S. Ferrari
ferrari@tia.ucsb.edu
tel: .

INVENTORS

- ▶ [Bowers, John E.](#)
- ▶ Huang, Duanni
- ▶ Pintus, Paolo

OTHER INFORMATION

KEYWORDS

Photonic integrated circuit,
Reconfigurable circulator,
Reversible circulator,
indtelecom, indmicroelec

CATEGORIZED AS

- ▶ **Energy**
 - ▶ Other
- ▶ **Engineering**
 - ▶ Engineering
- ▶ **Materials & Chemicals**
 - ▶ Other

RELATED CASES

2016-319-0

- ▶ Epitaxial Laser Integration on Silicon Based Substrates
- ▶ Magneto-Optic Modulator
- ▶ Quantum Dot Photonic Integrated Circuits
- ▶ Integrated Dielectric Waveguide and Semiconductor Layer
- ▶ Orthogonal Mode Laser Gyro
- ▶ Monolithically Integrated Laser-Nonlinear Photonic Devices
- ▶ Misfit Dislocation Free Quantum Dot Lasers
- ▶ Multiplexed Entangled Photon Generator Based On Integrated Photonic Microresonator Array

