Directional Coupled Waveguide Photo Detector

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BACKGROUND

Photo detectors convert radiation into electrical energy and are critical to many mixed signal environments, e.g., optoelectronics. At high optical powers, photo detectors saturate and generate more non-linear distortion, which is problematic for most applications including optical communications. Present technologies use passive waveguides to channel a percentage of optical input to the detector output but are not dynamic and unable to respond effectively to optical inputs, which exceed the linear range of the passive device.

TECHNOLOGY DESCRIPTION

UC San Diego researchers have developed a photo detector with robust performance across a wide range of optical power, eliminating the non-linearity when the detector enters its saturation mode. The invention provides a directional-coupler design that enables tailoring of the optical power distribution over an arrangement of absorbers in the waveguide. At the same time, the photo currents from the absorbers are collected and add in phase, even at high microwave frequencies. The material structure of the absorbers is optimized to facilitate carrier transport and thermal conduction. The end product is a high power, large bandwidth photo detector.

STATE OF DEVELOPMENT

This invention has a patent pending and is available for sponsored research and/or licensing.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	8,611,709	12/17/2013	2008-212

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OTHER INFORMATION

KEYWORDS
fiber optic communications, photo detector, directional coupler, waveguide

CATEGORIZED AS
- Optics and Photonics
  - All Optics and Photonics

RELATED CASES
2008-212-0

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