40 GHz, 1.5 - Micrometer Radiation Si-Waveguide Photodiode
Technology #12271

Applications

The invention can be used to improve the efficiency and adequacy of light sensors in integrated electronic interfacing circuits of an optical data communication system and the light sensor’s manufacturing process.

Problem Addressed

Light sensors (e.g., photodetectors) are costly and require manufacturing processes that differ from the process for manufacturing the electrical chip. In addition, photodetectors do not have a fast enough frequency response and suffer processing damage at temperatures above 200°C, which are required for CMOS processing.

Technology

The invention provides a system and method for a silicon optical waveguide photodetector that produces an electrical current by absorbing light of wavelengths from 1100 nm to >1750 nm in direct relationship to light intensity.

Advantages

- Uses smaller waveguide structures
- Proton implanted devices are stable with temperature
- Higher electric fields
- Better sensitivity and improved bandwidth
- Low cost compared to current photodetector

Categories For This Invention:

Lincoln Laboratory
Photonics
Sensors (Photonics)
Detectors

Intellectual Property:

System and method for providing a high frequency response silicon photodetector
Issued US Patent
7,880,204
Inventors:

Franz Kaertner
Michael Geis
Theodore Lyszczars
Matthew Grein
Donna Lennon
Robert Schulein
Steven Spector
Jung Yoon
Fuwan Gan

External Links:

Optics and Quantum Electronics Group
http://www.rle.mit.edu/oqe/
Lincoln Lab
http://www.ll.mit.edu/

Image Gallery:

FIG. 1