Sub-volt Electro-optic Modulator with 100 GHz Bandwidth

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OTHER INFORMATION

KEYWORDS

electro-optic modulator, fiber optics, networks, indtelecom, cenIEE, indmicroelec

CATEGORIZED AS

- **Optics and Photonics**
  - All Optics and Photonics
- **Communications**
  - Networking
  - Optical
- **Semiconductors**
  - Other

RELATED CASES

2013-171-0

BRIEF DESCRIPTION

An electro-optic modulator with 100 GHz bandwidth that requires less than 1V to turn on and off.

BACKGROUND

Today’s extensive and increasing internet use requires very wide bandwidths capable of quickly processing massive amounts of information. Optical modulators are essential components for fiber optic communication, RF photonics, instrumentation, and optical signal processing applications. Low drive voltage and wide bandwidth operation in optical modulators are highly desirable. However, achieving these two properties requires conflicting sets of design rules. There are examples of 100GHz bandwidth modulators but their drive voltages are very high at around 10 V. It is currently not possible to generate large voltages at extreme frequencies. Typically, to do so, a separate modulator driver is needed which adds cost, power, and complexity.

DESCRIPTION

Researchers at the University of California, Santa Barbara have successfully designed an optical modulator with an ultra-wide bandwidth and very low drive voltage. This approach is not restricted by the current bandwidth limit and offers a bandwidth exceeding 100 GHz with 0.4 volt, or less, operating voltage. This technology requires less than only 1 V and can be easily integrated with commercially available chips. Further, wide bandwidth electrical signals can be directly converted into optical signals offering significant cost, power, and complexity advantages.

ADVANTAGES

- Driven directly from electronic chips
- Consumes hundreds of times less power
- Allows for 100GHz bandwidth

APPLICATIONS

- Fiber optic networks
- Transmission systems

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,197,884	02/05/2019	2013-171
United States Of America	Issued Patent	9,733,543	08/15/2017	2013-171
United States Of America	Issued Patent	9,470,952	10/18/2016	2013-171

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