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(54) **INTEGRATED ELECTRO-ABSORPTION MODULATOR**

(71) Applicant: **Oracle International Corporation**, Redwood City, CA (US)

(72) Inventors: **John E. Cunningham**, San Diego, CA (US); **Jin Yao**, San Diego, CA (US); **Ivan Shubin**, San Diego, CA (US); **Guoliang Li**, San Diego, CA (US); **Xuezhe Zheng**, San Diego, CA (US); **Shiyun Lin**, San Diego, CA (US); **Hiren D. Thacker**, San Diego, CA (US); **Stevan S. Djordjevic**, San Diego, CA (US); **Ashok V. Krishnamoorthy**, San Diego, CA (US)

(73) Assignee: **ORACLE INTERNATIONAL CORPORATION**, Redwood Shores, CA (US)

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G02F 1/00	(2006.01)
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CPC ***G02F 1/025*** (2013.01); ***G02B 6/12*** (2013.01); ***G02F 1/0018*** (2013.01); ***G02F 1/015*** (2013.01); ***H01L 31/02327*** (2013.01); *G02B 2006/12107* (2013.01); *G02B 2006/12142* (2013.01); *G02F 2001/0157* (2013.01); *Y02P 70/521* (2015.11)

(58) **Field of Classification Search**
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See application file for complete search history.

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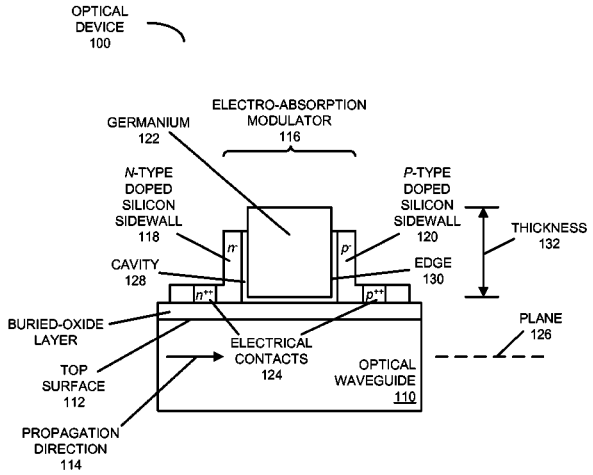
Primary Examiner — Thao P Le
(74) *Attorney, Agent, or Firm* — Park, Vaughan, Fleming & Dowler LLP

(57) **ABSTRACT**

An integrated optical device includes an electro-absorption modulator disposed on a top surface of an optical waveguide. The electro-absorption modulator includes germanium disposed in a cavity between an n-type doped silicon sidewall and a p-type doped silicon sidewall. By applying a voltage between the n-type doped silicon sidewall and the p-type doped silicon sidewall, an electric field can be generated in a plane of the optical waveguide, but perpendicular to a propagation direction of the optical signal. This electric field shifts a band gap of the germanium, thereby modulating the optical signal.

8 Claims, 7 Drawing Sheets