Dutch optical modulator for private power grid withstands low temperatures

Overview

Here we report an integrated current-driven modulator that is based on the magneto-optic effect and can operate at tempera-tures as low as 4 K. Here, we present stable DC operation of a thin-film lithium niobate modulator at liquid nitrogen accessible temperatures, pro-viding a low-cost alternative to thermal tuning demands and demonstrating accessibility for low-temperature appli-cations. The beam may be carried over free space, or propagated through an optical waveguide (optical fibre). You can cover wavelengths of between 500 and. One option is to use optical fibres as a medium in conjunc-tion with fast optical modulators that can be efficiently driven by electrical signals at low temperatures. However, as supercon-ducting circuits are current operated with low impedances, they interface poorly with conventional. High-performance integrated electro-optic modulators operating at low temperature are critical for optical interconnects in cryogenic applications.

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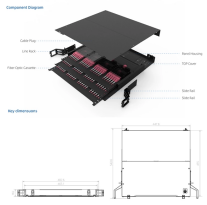
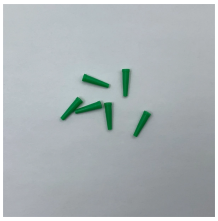


Our scalable modulator devices could provide cost-effective, low-power and ultra-high-speed solutions for next-generation optical communication networks and microwave photonic systems.

Here, we demonstrate an integrated graphene-based electro-optic modulator whose 14.7 GHz bandwidth at 4.9 K exceeds the room temperature bandwidth of 12.6 GHz. The bandwidth of the ...

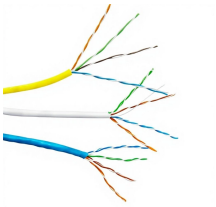


The fiber-coupled integrated optical modulators from Jenoptik are ideal for the amplitude or phase modulation of laser light. You can cover wavelengths of between 500 and 1.750 nanometers. The ...

Here we report an integrated current-driven modulator that is based on the magneto-optic effect and can operate at temperatures as low as 4 K.

In this Article, we report a high-speed MO modulator operating at temperatures as low as 4 K. The device is created by combining an MO garnet crystal with a silicon waveguide resonator and integrat ...

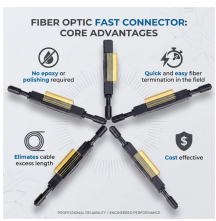
Today, the realisation of such photonic concepts is hindered by the lack of switches and modulators that operate at cryogenic temperatures with low-loss, high bandwidth, and low static power consumption.



An optical modulator is a device which is used to modulate a beam of light. The beam may be carried over free space, or propagated through an optical waveguide (optical fibre). Depending on the parameter of a light beam which is manipulated, modulators may be categorized into amplitude modulators, phase modulators, polarization modulators, etc. The easiest way to obtain modulation of intensity of a light beam is to modulate the current driving the light source, e.g. a laser diode. This sort of modulation is c...

Electro-optic (EO) modulators are a workhorse of communication and data infrastructure owing to the ability to multiplex electrical signals at high speeds onto low-loss op-tical carriers.

Optical modulators are used with superconductors which work properly only at low temperatures, generally just above absolute zero. Optical modulators convert information carried by an electric ...



This article presents a comprehensive review of various optical modulation technologies, including electro-optic, all-optical, acousto-optic, thermo-optic, and magneto-optic modulation.

	Silicon PICs have matured for room-temperature applications, but their cryogenic performance is limited by the absence of efficient low-temperature electro-optic modulation.

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