

عنوان مقاله:

Ultra-Compact Bidirectional Terahertz Switch Based on Resonance in Graphene Ring and Plate

محل انتشار:

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خلاصه مقاله:

In this paper, we present a switch based on coupling and resonance in the graphene plate and rings operating at ۱۰ THz. This structure consists of several layers of Hexagonal Boron Nitride (hBN), SiO₂ and P+Si, such that graphene plates and rings are inside the hBN layer. The terahertz wave is incident from the upper part of the switch and Surface Plasmons (SPs) are excited by the grating in the structure on the graphene plate beneath the nano-aperture and moves towards the ports available on the left and right of the switch. At first, at the certain applied voltage, the SPs cross the left port and this port is ON. With the increase in voltage and the change in the chemical potential, switching occurs and the SPs exit from the right and this port is ON while the left port turns OFF. The extinction ratio in this structure is ۱۸dB and the size of the structure is ۱μm. Aforementioned benefits make this switch the best choice for using in integrated optical circuits.

کلمات کلیدی:

Bidirectional Switch, Graphene, Resonance, Chemical Potential

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