

our designed band-engineered slow light photonic crystal waveguide, which demonstrated a large group index of 26.5 over an 18 nm bandwidth. By embedding the photonic crystal waveguide in a PIN diode structure, modulation operation with a record-low $V_{\pi} \times L$ of 0.0464 V.mm via carrier injection into an 80 μm long active section was experimentally demonstrated. The modulator $V_{\pi} \times L$ remains nearly constant over the low-dispersion slow-light bandwidth. Using the same structure, a maximum modulator operation up to 2GHz was also obtained. Further improvement in devices performance is expected by optimizing the electrical and optical design of the MZI structure.

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