Abstracts

Indirect optical control of microwave circuits using monolithic optically variable capacitors

A.S. Nafra, O. Jerphagnon, P. Chavarkar, M. VanBlaricum and R.A. York. "Indirect optical control of microwave circuits using monolithic optically variable capacitors." 1999 Transactions on Microwave Theory and Techniques 47.7 (Jul. 1999, Part II [T-MTT] (Special Issue on Microwave and Millimeter-Wave Photonics)): 1365-1372.

In this paper, we present an integrated circuit technology suitable for low-power bias-free optical control of microwave circuits and antennas. We have integrated miniature photovoltaic arrays with varactor diodes and thin-film resistors to form monolithic optically variable capacitors (OVCs). For the monolithic OVC described here, only 1.5 mW of optical power was required for more than 2:1 change in capacitance (0.9-0.4 pF). Optically controlled microwave circuits such as X-band analog phase shifters and tunable notch filters, which incorporated the monolithic OVC as the control element, were fabricated to demonstrate the potential of this technology.

❑ Return to main document.