Abstracts

A transmit/receive active antenna with fast low-power optical switching (Dec. 2000 [T-MTT])

J. Vian and Z. Popovic. "A transmit/receive active antenna with fast low-power optical switching (Dec. 2000 [T-MTT])." 2000 Transactions on Microwave Theory and Techniques 48.12 (Dec. 2000 [T-MTT] (Special Issue on 2000 International Microwave Symposium)): 2686-2691.

This paper presents an optically switched X-band active antenna element for half-duplex transmit/receive (T/R) applications. The antenna element is designed to be a unit cell of a quasioptical array with fast switching between T and R and with built-in phase-shifterless beamforming. The measured performance of the active element is 14 dB gain contributed by the power amplifier (PA) in transmission and 16 dB gain contributed by the low-noise amplifier in reception, with 30 dB isolation between T and R. The switching is accomplished with only 1 /spl mu/W of optical power for 1.7 /spl mu/s switching time (1.7 pJ of optical energy) and a rise time of 2 ns at 10 GHz with 7 mW of optical power (14 pJ of optical energy). The design, implementation, and measured performance of the optically controlled transmit/receive circuit are presented.

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