Abstracts

A transmit/receive active antenna with fast low-power optical switching (2000 Vol. II [MWSYM])

J. Vian and Z. Popovic. "A transmit/receive active antenna with fast low-power optical switching (2000 Vol. II [MWSYM])." 2000 MTT-S International Microwave Symposium Digest 00.2 (2000 Vol. II [MWSYM]): 847-850.

An X-band active antenna element for half-duplex transmit/receive (T/R) applications with efficient optical switching is presented. The antenna element is designed to be a unit cell of a quasi-optical 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, 16 dB gain contributed by the LNA 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, and a rise time of 2 ns at 10 GHz with 7 mW of optical power. The design, implementation and measured performance of the optically-controlled transmit/receive circuit are presented here in detail.

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