Abstracts

A Double-Stage Injection-Locked Oscillator for Optically Fed Phased Array Antennas

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In an optically fed phased array antenna system, the microwave carrier signal is transmitted via a modulated lightwave to each active T/R (transmit/receive) module, where it must be converted back to the microwave domain. Currently, efficient optical to microwave conversion is extremely difficult, as the detected microwave signal is weak and noisy. A novel circuit, containing a high-gain/low-noise microwave injection-locked oscillator, has been developed to improve the interface between the optical and microwave components. The circuit utilizes two FET's and a dielectric resonator, which serves as a frequency dependent feedback element. The circuit, designed to operate at about 8 GHz, provides significant amplitude and phase noise suppression. In addition, the circuit realization is compatible with MMIC technology.

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