Abstracts

Oscillator-Type Active-Integrated Antenna: The Leaky-Mode Approach

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This paper describes basic research carried out to design a microwave source module employing the concept of an active-integrated leaky-mode antenna. The novel active-antenna source module utilizes a microstrip as the radiating element while adopting uniplanar technology for the active circuit design. The microstrip is operated in the first higher order odd mode, which is a leaky mode, and excited by a proximity-coupled center-fed slotline on the same surface of the uniplanar microwave-integrated circuit. The measured performance of an X-band transmission-type injection-locked active-integrated antenna source module demonstrated that such a design approach was suitable for linear array integration for quasi-optical power combining. The harmonic-balance (HB) analysis of the proposed active-integrated antenna agrees with the measurements in both free-running frequency and power level. The measured radiation patterns of the active-integrated antenna also agree well with the theoretical predictions.

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