Abstracts

Novel architectures for high-efficiency amplifiers for wireless applications

V. Radisic, Y. Qian and T. Itoh. "Novel architectures for high-efficiency amplifiers for wireless applications." 1998 Transactions on Microwave Theory and Techniques 46.11 (Nov. 1998, Part II [T-MTT] (Special Issue on Innovative Integration Techniques for Microwave and Millimeter-Wave Circuits)): 1901-1909.

This paper presents three novel architectures for high-efficiency amplifiers relying on new harmonic-tuning techniques. These methods yield high-efficiency power amplifiers and reduce unwanted harmonic radiation from the transmitter front end. The first method uses the active integrated-antenna approach to perform harmonic tuning. The second method uses a nontraditional periodic microstrip filter, which allows broadband harmonic tuning. Finally, the third method combines the previous two approaches. Each technique is illustrated by a design example of a power amplifier integrated with an antenna. Guidelines for choosing the appropriate antenna structure and for designing the periodic structures are also presented. Another design issue is inclusion of the antenna and/or periodic structures into the amplifier simulation. To do this, a hybrid approach combining the finite-difference time-domain (FDTD) analysis and harmonic-balance simulation is employed.

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