Abstracts

Harmonic Reaction Amplifier - A Novel High-Efficiency and High-Power Microwave Amplifier

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A newly proposed high efficiency amplifier, the Harmonic Reaction Amplifier (HRA), is presented. Power-added efficiency of 75°A (85% drain efficiency) is achieved with a 3-W HRA using GaAs FETs in the 1.7 GHz band. The operation principle is derived from a novel second-harmonic injection technique enabling purely class-B biased operation. Amplifier circuits for attaining high efficiency operation can easily be constructed with ordinary microstrip circuits. Besides, precise circuit adjustment is available to maximize the efficiency. The HRA makes high power and high efficiency microwave power amplifiers with zero quiescent current possible. Experimental test results show the feasibility of a quasi-microwave transmitting amplifier for the next generation mobile radio system. However, the HRA can be applied to radio equipment of various fields such as terrestrial microwave radio systems and satellite communications systems using microwave frequency bands.

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