Abstracts

High-efficiency power amplifier using dynamic power-supply voltage for CDMA applications

G. Hanington, Pin-Fan Chen, P.M. Asbeck and L.E. Larson. "High-efficiency power amplifier using dynamic power-supply voltage for CDMA applications." 1999 Transactions on Microwave Theory and Techniques 47.8 (Aug. 1999 [T-MTT] (Mini-Special Issue on Low-Power/Low-Noise Technologies for Mobile Wireless Communications)): 1471-1476.

Efficiency and linearity of the microwave power amplifier are critical elements for mobile communication systems. This paper discusses improvements in system efficiency that are obtainable when a DC-DC converter is used to convert available battery voltage to an optimal supply voltage for the output RF amplifier. A boost DC-DC converter with an operating frequency of 10 MHz is demonstrated using GaAs heterojunction bipolar transistors. Advantages of 10 MHz switching frequency and associated loss mechanisms are described. For modulation formats with a time-varying envelope, such as CDMA, the probability of power usage is described. Gains in power efficiency and battery lifetime are calculated. An envelope detector circuit with a fast feedback loop regulator is discussed. Effects of varying supply voltage with respect to distortion are examined along with methods to increase system linearity.

❑ Return to main document.