Abstracts

A predistortion linearizer using envelope-feedback technique with simplified carrier cancellation scheme for class-A and class-AB power amplifiers

Hyun-Min Park, Dong-Hyun Baek, Kye-Ik Jeon and Songcheol Hong. "A predistortion linearizer using envelope-feedback technique with simplified carrier cancellation scheme for class-A and class-AB power amplifiers." 2000 Transactions on Microwave Theory and Techniques 48.6 (Jun. 2000 [T-MTT] (Mini-Special Issue on the 1999 IEEE Radio and Wireless Conference (RAWCON))): 898-904.

A predistortion linearization method using an envelope-feedback technique is proposed and implemented in this paper. This linearizer compensates the gain and phase nonlinearity of power amplifier (PA) simultaneously by controlling both variable attenuator and phase shifter with the feedback of only the difference signal between input and output envelopes. A new carrier cancellation scheme composed of a minimization circuit, log detector, and vector modulator is also presented. This circuit achieves adaptive control of the linearizer by enabling direct measurement of out-of-band power. It is well suited to a multichannel system where the allocated channels are time variant. The principle of the proposed linearizer is described and simple AM-AM distortion analysis is presented analytically and graphically based on the conceptual schematic diagram. A two-tone test for a class-A PA at 1.855 GHz with frequency spacing of 1 MHz showed intermodulation-distortion reduction of maximum 16 dB and stable operation over 5-dB output power variation up to 4-dB backoff from the saturation power level. The proposed linearizer is also applicable to class-AB PA's without further special adjustments. The adaptation circuit is fully implemented with analog integrated circuits, which can further extend its applicability with the integration technology.

❑ Return to main document.