Abstracts

Adaptive Digital Predistorter for Power Amplifiers with Real Time Modeling of Memoryless Complex Gains

When the resulted signal from linear modulation methods, like M-ary QAM, are passed through a nonlinear power amplifier, their fluctuating envelope causes distortion and spectral spreading. In order to avoid these effects, maintaining both power and spectral efficiency, lead to use of linearization techniques. This paper presents a digital predistorter with real time modeling of AM-AM and AM-PM characteristics of a power amplifier (PA). The input and output lowpass equivalent complex envelopes of the amplifier are sampled, scaled and updated into a lookup table to provide the predistorted signal. An improvement of 45 dB of out-of-band power is obtained in simulating with Signal Processing WorkSystem (SPW). Then, convergence time is eliminated. The proposed technique is robust and efficient since no iterative procedure is needed, hence the convergence time is eliminated.

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