Abstracts

On the significance of envelope peak-to-average ratio for estimating the spectral regrowth of an RF/microwave power amplifier

J.F. Sevic and M.B. Steer. "On the significance of envelope peak-to-average ratio for estimating the spectral regrowth of an RF/microwave power amplifier." 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))): 1068-1071.

The peak-to-average ratio (PAR) of a signal is commonly used for estimating the backoff required for an radio-frequency/microwave power amplifier to exhibit acceptable intermodulation distortion. In this paper, it is shown that the PAR is an inaccurate metric for predicting the backoff and can lead to improper choices for modulation with respect to the linearity-efficiency tradeoff. A specific case is presented, based on the IS-94 code-division multiple-access communication (CDMA) reverse-link and IS-95 CDMA forward-link wireless standards. Using simulation and load-pull measurements, it is illustrated that although quaternary phase-shift keying has a higher PAR than offset QPSK (O-QPSK), it has lower adjacent-channel power, for constant average power. This observation, contrary to what is expected, is explained by introducing the envelope distribution function, which characterizes the saturation of an amplifier based on the time-domain statistics of the applied signal.

❑ Return to main document.