Abstracts

Out-of-band emissions of digital transmissions using Kahn EER technique

D. Rudolph. "Out-of-band emissions of digital transmissions using Kahn EER technique." 2002 Transactions on Microwave Theory and Techniques 50.8 (Aug. 2002 [T-MTT]): 1979-1983.

The Kahn envelope elimination and restoration (EER) technique allows for linear RF power amplification by combining nonlinear, but efficient, RF and AF power amplifiers (PAs). In order to use the EER technique for digital signals, a coordinate transform from the original Cartesian in-phase and quadrature mode into a polar mode has to take place, yielding an envelope (or amplitude) and a PM RF signal. This coordinate transform is extremely nonlinear and thereby broadens the spectra of the original signals. In the final PA stage, both signals are recombined. However, since this recombination process is imperfect, out-of-band (OOB) emissions come up, also known as adjacent channel power or spectral regrowth. In this paper, the impact of the broadening of the amplitude and phase signals on OOB emissions is investigated with respect to imperfect restoration due to signal delays and limited bandwidth of the amplitude path. It is shown that the amount of OOB emissions can significantly be reduced if the modulation scheme shows a "hole" at the origin in its vector diagram.

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