

NONLINEAR WIDEBAND RF POWER AMPLIFICATION OF MIXED SINGLE AND MULTI CARRIER SIGNALS

O'Droma Mairtin and Nana Mgebrishvili

Electronic and Computer Engineering, University of Limerick, Limerick, Ireland.

Abstract:

A solution for the behavioral analysis of nonlinear wideband rf power amplification of mixed single carrier and multi-carrier, OFDM-type, wireless air-interface signals is presented. A new expression for the statistical description of the power amplifier (PA) output for simultaneous single and multi-carrier inputs - one or two single carrier and an OFDM signal. A general small and large signal model of a memoryless nonlinear amplifier is derived for this situation. Use of the model to quantify the modulation fidelity (MF) deterioration due to distortion arising from PA nonlinearities, and its amelioration by the application of PA linearisation measured in terms of percentage linearisation (PL) is demonstrated.