

Analysis and Linearization of a Broadband Microwave Phase Modulator Using Volterra System Approach

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In this paper, a Volterra system approach is employed to analyze a nonlinear delay line that is used as a broadband phase modulator. Computed response waveform of the modulator in the time domain is compared with experimental results in order to confirm the Volterra system approach. The phase versus voltage characteristics of the modulator is then linearized using a predistortion circuit in which the parameters are derived from the Volterra kernels. Harmonic and intermodulation distortions are calculated with and without the predistortion circuit. It is shown that the use of the predistortion circuit results in a considerable reduction of these distortions.

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