Abstracts

High-temperature superconducting nonlinear transmission lines

G.M. Coutts, R.R. Mansour and S.K. Chaudhuri. "High-temperature superconducting nonlinear transmission lines." 2000 Transactions on Microwave Theory and Techniques 48.12 (Dec. 2000 [T-MTT] (Special Issue on 2000 International Microwave Symposium)): 2511-2518.

This paper introduces novel potential device applications based on the nonlinear phase shifting properties of high-temperature superconductor (HTS) transmission lines. It demonstrates how the nonlinear characteristics of HTS materials can be used to build devices that improve the risetime of pulses as well as exhibit power-dependent phase shifting properties. The nonlinear transmission-line circuit layouts consist of a linear transmission-line periodically loaded with HTS stubs operating in the nonlinear region. Theoretical results are presented using a lumped-element SPICE model to verify the pulse-shaping concept presented in this paper. The power-dependent phase shifting properties are demonstrated with the measurements of two prototype circuits.

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