Abstracts

A fully distributed heterostructure-barrier varactor nonlinear transmission-line frequency multiplier and pulse sharpener

Ming Li, K. Krishnamurthi and R.G. Harrison. "A fully distributed heterostructure-barrier varactor nonlinear transmission-line frequency multiplier and pulse sharpener." 1998 Transactions on Microwave Theory and Techniques 46.12 (Dec. 1998, Part II [T-MTT] (1998 Symposium Issue)): 2295-2301.

The discrete symmetric heterostructure-barrier varactor (HBV) was previously developed as an unbiased frequency-tripling device that needed no second-harmonic idler circuit. Other work investigated nonlinear transmission lines (NLTLs) employing discrete varactors attached to linear guiding structures. Fully distributed Schottky-varactor NLTLs were excessively lossy. This paper explores NLTLs based on fully distributed HBV structures. Using both a modified finite-difference time-domain method and numerical integration, it is shown that such NLTL's can provide efficient tripling over a wider input bandwidth than is possible with fixed-tuned triplers. It is also demonstrated that the nonlinearity is strong enough for the NLTL to act as a pulse-sharpening device.

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