Abstracts

Novel Low-Loss Delay Line for Broadband Phased Antenna Array Applications

W.-M. Zhang, R.P. Hsia, C. Liang, G. Song, C.W. Domier and N.C. Luhmann, Jr.. "Novel Low-Loss Delay Line for Broadband Phased Antenna Array Applications." 1996 Microwave and Guided Wave Letters 6.11 (Nov. 1996 [MGWL]): 395-397.

The microwave propagation velocity along a nonlinear transmission line is a function of dc bias, hence, a nonlinear transmission line (NLTL) can be utilized as a broadband delay line. A hybrid NLTL has been fabricated in a proof-of-principle experimental concept test where a 1.1-ns true time delay with <4-dB insertion loss has been measured in good agreement with theory. A 2 x 2 NLTL-based antenna array has been utilized to demonstrate beam steering at 5 GHz. Using parameters appropriate to varactors tested by our group at 60 GHz, a monolithic NLTL is predicted to exhibit <3.4-dB insertion loss and 200 ps delay at 20 GHz.

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