Abstracts

New tunable phase shifters using perturbed dielectric image lines (Oct. 1998, Part I [T-MTT])

Ming-Yi Li and Kai Chang. "New tunable phase shifters using perturbed dielectric image lines (Oct. 1998, Part I [T-MTT])." 1998 Transactions on Microwave Theory and Techniques 46.10 (Oct. 1998, Part I [T-MTT]): 1520-1523.

This paper presents new tunable phase shifters using perturbed dielectric image lines (DILs). The propagation constant in the DIL was perturbed by a movable metal reflector plate installed in parallel with the ground plane of the DIL. The phase shift was thus controlled and adjusted by varying the perturbation spacing between the DIL and movable reflector plate at a given operating frequency. A rigorous hybrid-mode analysis was used for calculating the dispersion of propagation constants in the perturbed DIL, and then for designing tunable phase shifters. Ka-band tunable phase shifters have been designed, fabricated, and tested. Measurement results agree well with theoretical predictions. The device is especially useful for millimeter-wave applications where traditional phase shifters are lossy.

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