

“Wiggly-line” Perturbation Applying to Ground Plane Aperture for Multispurious Rejection in Microstrip Parallel Coupled Line Filter

M. Moradian and M. R. Hajhashemi

Isfahan University of Technology, Iran

S. V. Mirmoghtadaie

Isfahan University, Iran

In this paper a suitable method is presented which allows removing the spurious pass-bands of a parallel coupled-line bandpass filter. This configuration is constructed by applying wiggly line perturbation to the ground plane slot widths. First ground-plane slot dimensions are optimized for compensating the unequal modal electrical lengths using a commercially available electromagnetic simulator IE3D [1]. Using this method the double frequency spurious band associated with unequal even/odd electrical lengths can be suppressed or meaningfully reduced [2], then the slot widths is modulated with sinusoidal perturbations. The periods of the sinusoidal perturbations are selected according to desired spurious bands that must be rejected. Finally, in essential conditions, only the widths, gaps spacing and lengths of the coupled-line filter may be optimized to overcome the first passband perturbation. If the sinusoidal perturbations are applied to strip widths the first passband may be perturbed and optimization of coupled line dimensions is difficult [3]. With the proposed method undesired harmonic passbands of the filter are rejected. In addition optimization of coupled line dimensions is done easily.

REFERENCES

1. Zeland Software Inc., IE3D Manual, 2004.
2. Velázquez-Ahumada, M. D. C., J. Martel, and F. Medina, “Parallel coupled microstrip filters with ground-plane aperture for spurious band suppression and enhanced coupling,” *IEEE Trans. Microwave Theory and Techniques*, Vol. MTT-52, 1082–1086, Mar 2004.
3. Nerukh, A., P. Sewell, and T. M. Benson, “Volterra integral equations for nonstationary electromagnetic processes in time-varying dielectric waveguides,” *J. of Lightwave Techn.*, Vol. 22, No. 5, 1408, 2004.
4. Lopetegi, T., M. A. G. Laso, F. Falcone, F. Martin, J. Bonache, J. Garcia, L. Pérez-Cuevas, M. Sorolla, and M. Guglielmi, “Microstrip “wiggly-line” bandpass filters with multispurious rejection,” *IEEE Microwave Wireless Compon. Lett.*, Vol. 14, 531–533, Nove 2004.