Abstracts

Spectral Domain Analysis of Three Symmetric Coupled Lines and Application to a New Bandpass Filter

A quasistatic analysis and detailed investigation are performed on three coupled, symmetric suspended striplines and microstriplines. The self and mutual capacitances of the structure, the per-unit-length capacitance matrix elements, and the three quasi-TEM mode per-unit-length capacitances are derived explicitly for the first time in terms of capacitances corresponding to arbitrary excitations. Normal mode characteristic impedance and effective dielectric constant data are presented. The mode impedances of the lines are found to be unequal for lines of equal width unlike previously reported. Chain matrix parameters for a new bandpass filter employing three coupled lines are derived. A filter with passband centered at 3 GHz has been designed, built, and tested, and measured performance shows good agreement with theoretically predicted performance.

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