

Passive closed-form transmission-model for general purpose circuit simulators

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A passive closed-form model for multiconductor lossy transmission line analysis is presented. The proposed model is suitable for inclusion in general purpose circuit simulators and overcomes the mixed frequency/time simulation difficulties encountered during the transient analysis. The method offers an efficient means to discretize the transmission lines compared to the conventional lumped discretization while preserving the passivity of the discrete model. Coefficients describing the discrete model are computed a priori and analytically, using closed-form Pade approximants of exponential matrices.

 [Return to main document.](#)