Abstracts

Two techniques for the efficient numerical calculation of the Green's functions for planar shielded circuits and antennas

A. Alvarez-Melcon and J.R. Mosig. "Two techniques for the efficient numerical calculation of the Green's functions for planar shielded circuits and antennas." 2000 Transactions on Microwave Theory and Techniques 48.9 (Sep. 2000 [T-MTT] (Mini-Special Issue on Research Reported at the 8th Topical Meeting on Electrical Performance of Electronic Packaging (EPEP) 1999)): 1492-1504.

In this paper we present new contributions to the computation of the Green's functions arising in the analysis of multilayered shielded printed circuits and antennas. First the quasistatic term of the spectral domain Green's functions is extracted so that the convergence of the reminder dynamic modal series is enhanced. Moreover, it is shown that by extracting a second-order quasi-static term the convergence is further improved. In regard to the quasi-static terms, they are computed in the spatial domain by numerically evaluating the associated spatial images series. Then a new and efficient technique is developed for the summation of the slowly convergent modal series. The technique can be viewed as the application of the integration by parts technique to discrete sequences and greatly accelerates the convergence rate of the series involved. It is shown that the new algorithm is numerically very robust and leads to a drastic reduction in the computational effort and time usually required for the numerical evaluation of the shielded Green's functions.

❑ Return to main document.