Abstracts

Resonant Frequencies of the Axial Symmetric Modes in a Dielectric Resonator

W.C. Chew and M. Moghaddam. "Resonant Frequencies of the Axial Symmetric Modes in a Dielectric Resonator." 1987 MTT-S International Microwave Symposium Digest 87.1 (1987 Vol. I [MWSYM]): 303-305.

Dielectric resonators have been proven possible for a long time. However, they had not been popular in the past due to the absence of temperature stable and low loss materials. The recent advent of low loss, temperature stable materials has made them useful in a number of microwave circuit applications, The analysis of such a resonator in the past has relied on approximate methods. We shall present a rigorous field analysis of the circular dielectric resonator embedded in an in homogeneous medium. The analysis is via a numerical mode matching method, whereby the problem of finding the modes of the circular dielectric cylinder is cast into a conventional eigenvalue problem which could be solved rapidly on the computer. This method bypasses the need to use Hankel and Bessel functions, which could be time consuming to evaluate. The scattering of the field off the ends of the resonator are characterized by reflection operators. The resonant frequencies of the resonator could be easily found by requiring the phase coherence of the wave after reflection off the two ends of the resonator.

❑ Return to main document.