Abstracts

The Reflection from an Open-Ended Rectangular Waveguide Terminated by a Layered Dielectric Medium

V. Teodoridis, T. Sphicopoulos and F.E. Gardiol. "The Reflection from an Open-Ended Rectangular Waveguide Terminated by a Layered Dielectric Medium." 1985 Transactions on Microwave Theory and Techniques 33.5 (May 1985 [T-MTT]): 359-366.

The measurement of reflection from an open-ended waveguide is a simple and nondestructive technique for determining the dielectric properties of materials. A flange-mounted waveguide is considered, the flange being pressed on an unknown material which may be of finite or infinite thickness. The relationship linking the reflection coefficient to the dielectric properties is obtained from a theoretical analysis of the electromagnetic field in the vicinity of the aperture. The theory includes the effects of both cross polarization and higher order modes. An integral equation is obtained, the kernel of which is the dyadic Green function in each medium. The method of characteristic modes is used for the numerical computation. The theoretical results are in good agreement with experimental measurements. Futhermore, a simple and handy technique for data inversion is provided.

❑ Return to main document.