

## TE/sub 10/ Mode Scattering by a Rectangular Resistive Film of Arbitrary Dimensions Placed Along the Rectangular Waveguide Axis

---

*I.M. Braver, P.S. Fridberg, K.L. Garb, S.V. Makarov and I.M. Yakover. "TE/sub 10/ Mode Scattering by a Rectangular Resistive Film of Arbitrary Dimensions Placed Along the Rectangular Waveguide Axis." 1991 Transactions on Microwave Theory and Techniques 39.3 (Mar. 1991 [T-MTT]): 438-443.*

TE/sub 10/ mode scattering by a resistive film of arbitrary width ( $d$ ) and length ( $l$ ) placed in the longitudinal section of a rectangular waveguide parallel to its narrow faces is investigated. The vector integral equation for the discontinuity ( $\int_{\text{spl}} \text{rarr} / h$ ) of the tangential magnetic field on the film is formulated. The equation is solved by Galerkin method using basis functions, each of them taking into account the  $\int_{\text{spl}} \text{rarr} / h$  behavior near the film edge. For a film that is sufficiently short ( $l \ll d$ ), approximate expressions for the scattering matrix elements are obtained. The scattering matrix for a wide range of values of the film width, length, surface impedance ( $W$ ), and frequency is calculated. This is believed to be the first study establishing that the attenuation caused by a film having particular  $d$  and  $W$  values tends to be constant over the entire band of waveguide operating frequencies.

 [Return to main document.](#)