Abstracts

A Study of Electric-Field Breakdown in E-Plane Lines at Centimeter and Millimeter Wavelengths

M.M. Ney, S.R. Valluri, W. Yue, G.I. Costache and W.J.R. Hoefer. "A Study of Electric-Field Breakdown in E-Plane Lines at Centimeter and Millimeter Wavelengths." 1987 Transactions on Microwave Theory and Techniques 35.5 (May 1987 [T-MTT]): 502-509.

The microwave field breakdown in various E-plane transmission lines is investigated theoretically in the frequency range from 1 to 140 GHz. The influence of frequency, pressure, temperature, and inhomogeneity of the applied field on the breakdowm field value is discussed. The peak power-handling capability of unilateral and bilateral finlines is determined theoretically using a quasi-static evaluation of the field distribution. It is found that finlines, even with small gap widths, can handle pulse power levels well above the capability of present solid-state devices. Preliminary breakdown measurements in X-band have confirmed the validity of the theoretical predictions.

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