Abstracts

Microwave breakdown in resonators and filters

D. Anderson, U. Jordon, M. Lisak, T. Olsson and M. Ahlander. "Microwave breakdown in resonators and filters." 1999 Transactions on Microwave Theory and Techniques 47.12 (Dec. 1999 [T-MTT] (Special Issue on 1999 International Microwave Symposium)): 2547-2556.

Several aspects of microwave breakdown in resonators are discussed in this paper. Approximate analytical criteria are formulated for the critical microwave breakdown field in some illustrative model geometries, which clearly brings out the main physical properties of microwave-induced breakdown in the presence of inhomogeneous electric fields. The analytical results are verified by comparisons with numerical calculations. A full numerical solution procedure for determining the microwave breakdown field in commercially available resonator designs is also presented. The numerical predictions are compared with experimental results, demonstrating very good agreement in the pressure range available for the experiments. The success of the predictions of the breakdown threshold suggests methods complementary to high-power pulse testing of radio-frequency filters.

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