Abstracts

Simplified method for measurements and calculations of coupling coefficients and Q/sub 0/ factor of high-temperature superconducting dielectric resonators

M.V. Jacob, J. Mazierska, K. Leong and J. Krupka. "Simplified method for measurements and calculations of coupling coefficients and Q/sub 0/ factor of high-temperature superconducting dielectric resonators." 2001 Transactions on Microwave Theory and Techniques 49.12 (Dec. 2001 [T-MTT] (Special Issue on 2001 International Microwave Symposium)): 2401-2407.

To accurately determine the surface resistance of high-temperature superconducting films, multifrequency measurements of S/sub 21/, S/sub 11/, and S/sub 22/ and sophisticated data processing are required. As a result, surface resistance measurements and calculations for varying temperatures are very time consuming. In this paper, we introduce a simplified method for calculations of the unloaded Q (Q/sub 0/) factor, which require measurements of S/sub 11/ and S/sub 22/ at the lowest temperature only. For all other temperatures, only S/sub 21/ measurements are needed. The method has been shown to give sufficiently accurate Q/sub 0/ values and, hence, the surface resistance of superconducting samples, as compared to results obtained from S/sub 21/, S/sub 11/, and S/sub 22/ measurements using the transmission-mode Q factor technique. The presented method has been tested under different coupling coefficients and frequencies.

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