Abstracts

Novel method for calculation and measurement of unloaded Q-factor of superconducting dielectric resonators

M.V. Jacob, J. Mazierska, K. Leong and J. Krupka. "Novel method for calculation and measurement of unloaded Q-factor of superconducting dielectric resonators." 2001 MTT-S International Microwave Symposium Digest 01.3 (2001 Vol. III [MWSYM]): 1993-1996 vol.3.

The dielectric resonator technique is recognised as the best method for the measurement of surface resistance (R/sub s/) of High Temperature Superconducting thin films. The R/sub s/ is calculated from the Unloaded Q-factor (Q/sub 0/) of the resonator, and to obtain accurate values of the Q/sub 0/-factor multi-frequency measurements of S/sub 21/, S/sub 11/ and S/sub 22/ and data circle fitting are required. As a result, surface resistance measurements at varying temperatures are very time consuming. In this paper we introduce a simplified method for calculations the 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 shown to give sufficiently accurate Q/sub 0/ values and hence the surface resistance.

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