Abstracts

Design of an image-type dielectric resonator to measure surface resistance of a high-T/sub c/ superconductor film

Y. Kobayashi and T. Hashimoto. "Design of an image-type dielectric resonator to measure surface resistance of a high-T/sub c/ superconductor film." 2001 MTT-S International Microwave Symposium Digest 01.1 (2001 Vol. I [MWSYM]): 495-498 vol.1.

A new measurement method using two resonant modes, the TE/sub 021/ and TE/sub 012/ modes, in an image-type dielectric resonator is proposed to measure the surface resistance R/sub s/ of a high-T/sub c/ superconductor (HTS) film and the loss tangent tan/spl delta/ of a sapphire rod separately, precisely and nondestructively. A sapphire resonator is set in a cavity constructed from two HTS films and a copper cylinder. This resonator structure is designed from the mode charts calculated on the basis of the rigorous analysis by the mode matching method. It is verified that the mode chart also is effective to identify many resonant modes observed in measurement. The temperature dependence of R/sub s/ of a YBCO film was measured at 20 GHz by this method. The measured result agrees very well with one by the conventional two-resonator method.

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