Abstracts

Influence of Buffer Layers within YBa/sub 2/Cu/sub 3/O/sub 7-x/ Coplanar Waveguide Structures

J. Kebler, R. Dill and P. Russer. "Influence of Buffer Layers within YBa/sub 2/Cu/sub 3/O/sub 7-x/ Coplanar Waveguide Structures." 1992 Microwave and Guided Wave Letters 2.1 (Jan. 1992 [MGWL]): 6-7.

A YBa/sub 2/Cu/sub 3/O/sub 7-x/ coplanar waveguide structure is investigated theoretically by means of a partial wave synthesis. The high-T/sub c/. superconductor material is described by the two-fluid model and the London theory. A very thin buffer layer of about 100 nm thickness is positioned between the substrate and the superconducting film. The material combinations considered for buffer layer/substrate are: zirconium oxide/sapphire, strontium titanate/sapphire, zirconium oxide/silicon and Ianthan aluminate/silicon. The influence of these buffer layers on effective permittivity and attenuation is examined over a wide range of structure widths whereby the attenuation is subdivided into superconductor losses, losses in the buffer layer and substrate losses. It is shown that zirconium oxide as buffer layer on a sapphire substrate is a very interesting choice, because the superconductor losses are the dominant losses over the considered range of gap widths from 1 µm to 100 µm.

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