Abstracts

Optimization of the Thick-and Thin-Film Technologies for Microwave Circuits on Alumina and Fused Silica Substrates

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Two technologies can be used in the fabrication of microwave integrated circuits (MIC's), thick film and thin film. This paper describes and compares these technologies. Two types of substrates commonly used in MIC's are tested, alumina (AL/sub 2/O/sub 3/) for the X band, and, because of its better optical flatness and its Lower dielectric constant, fused silica (SiO/sub 2/) for the KU band. The parameters examined are, for thick-film circuits, the nature of metallizations, the method of circuit definition, and the influence of the ground plane, and for thin-film circuits, the influence of the adhesive layer and the thickness of the deposited gold. The parameters selected for the microwave comparison are the microwave Quality factor (Q) of the conductors, the adhesion of the conductor, and the ability to be wire bonded. The results show that, when their technology is optimized, thick films can be as good as thin films in the X band on alumina substrates. On silica subtrates, thin films are better and will be preferred in the KU band (by extension of the C-band measurements).

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