Abstracts

Survey of Integrated Circuits with Implications for Microwaves

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There are two major, or classical, categories of integrated circuits based on the techniques employed: film circuits and semiconductor monolithic circuits. With the film technique one or more elements and/or components are deposited by one of several methods on a passive substrate, e. g., glass or ceramic, to form resistors, capacitors and electrical interconnections. Active elements, i. e., transistors and diodes, must be affixed separately to metallic connectors on the substrate. In the semiconductor monolithic approach the entire circuit containing resistors, capacitors, diodes and transistors is fabricated within a solid block of semiconductor material by using selected diffusion techniques. The advantage of the monolithic circuit, that of having all of the circuit elements as an integral part of the structure, is offset to some extent by the somewhat poorer characteristics of the resistors and capacitors relative to their film counterparts. Both types of integrated circuits have been used in a variety of applications, both digital and analog. Film circuits generally have been developed for specific needs by systems manufacturers, whereas monolithic circuits have been made available by a number of semiconductor device manufacturers throughout the world.

❑ Return to main document.