

Abstracts

Session 4 Introduction (1984 [MWSYM])

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Monolithic integrated circuits operating at frequencies in excess of 1 GHz are rapidly becoming realities of the marketplace. To remain competitive requires not only knowledge in semiconductor materials, device, and circuit technology, but also sophisticated ability to accurately measure, test, and characterize. Only then can sufficiently accurate models be developed with which to design, fabricate and efficiently produce. This session emphasizes the "tools" essential to furthering monolithic integrated circuit technology. Included are instrument probes and calibration methods, high heterojunction performance devices, high efficiency millimeter wave power devices, and accurate design models for on-chip spiral inductors. The session begins with a paper describing new and accurate techniques for probing a wafer or die at its intended operating frequency. While problems such as common lead inductance and capacitive coupling between adjacent lines are among the least of "worries" for a discrete device designer, the adverse crosstalk introduced is well known to the hybrid circuit designer and is of major concern to the designer of monolithic circuits. Not only must crosstalk be addressed within the integrated circuits, but I/O pads on the die must be both judiciously placed and of proper impedance if accurate probe measurements are to be obtained. Without adequate forethought being given to characterization and testing, testprobe crosstalk can be adversely impaired. For digital ICS, this frequently leads to a requirement for balanced, low impedance I/O pads. In addition to I/O impedance and pad placement to reduce crosstalk, additional consideration must be given to test pad placement to accurately measure propagation delay and phasing.

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