Abstracts

Application Specific MMIC: A Unique and Affordable Approach to MMIC Development

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The high levels of integration possible with GaAs Microwave Monolithic Integrated Circuits has the potential of tremendous benefits of reduced cost, size, and weight and increased reliability of microwave systems. These benefits have only been realized for systems that can justify the high costs and risk of MMIC development. Application Specific MMIC (ASMMIC) promises to simplify the development process and hence reduce the development cost and risk. Furthermore, ASMMIC can realize volume production savings through a shared production process and through increased production demand. The foundation of the innovative ASMMIC concept is a predesigned footprint building block. This footprint comprises the layers containing FETs, resistors and diodes in an array compatible with a wide range of circuit functions. The chip is completed by applying personalized metalization to the footprint. Wafers of footprints can reproduced in volume, fully characterized, and placed in inventory. The characterized data will be used as accurate parameters of the models contained in the ASMMIC CAD library. The ASMMIC CAD will facilitate the design of the metalization layers which establish the circuit functionality (amplifier, mixer, oscillator, limiter, switch, isolator, attenuator, etc.) and the operating frequency and power range. The design and application of the metalization layers can be accomplished with high confidence and within a time span of a few weeks. This contrasts with a complex "from the ground up" custom design and production process requiring many months and one that inherently has the potential for many design and process errors. ASMMIC offers the possibility of making MMICs accessible, affordable and available for a broad range of systems applications. To ensure accessibility, the ASMMIC technology will be readily transferable to a wide range of users through computer aided engineering tools which are being developed.

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