Abstracts

A 38-GHz integrated uniplanar subsystem for high-speed wireless broad-band multimedia systems

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This paper outlines the high flexibility of the uniplanar technology to design complex multifunction subsystems. Furthermore, a design procedure based on a subsystem repartition into elementary blocks and a very simple electrical modeling is proposed and applied to a uniplanar biphase (0/spl deg/-180/spl deg/) modulator/mixer, which is intended to be used as building block for wideband digital communication systems at 38 GHz. This subsystem is implemented on a high dielectric-constant substrate (/spl epsiv//sub r/=9.9), which is close to the dielectric constant of GaAs and demonstrates the feasibility of integration of such a device structure into monolithic circuits. This approach has been initially validated with experiments on a subsystem up to 20 GHz and preliminary results demonstrate the validity of this subsystem design procedure at millimeter-wave frequencies. Theoretical field calculation methods are combined with conventional transmission-line and computer-aided design calculations to analysis the critical parts of the subsystem and the integral-equation approach is used for efficiency design.

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