Abstracts

Planar Millimeter-Wave Antennas Using SiN/sub x/-Membranes on GaAs (Short Papers)

M. Stotz, G. Gottwald, H. Haspeklo and J. Wenger. "Planar Millimeter-Wave Antennas Using SiN/sub x/-Membranes on GaAs (Short Papers)." 1996 Transactions on Microwave Theory and Techniques 44.9 (Sep. 1996 [T-MTT]): 1593-1595.

Planar aperture coupled microstrip antennas for 77 GHz are demonstrated for the first time, As far as possible standard GaAs monolithic microwave/millimeter-wave integrated circuit (MMIC) technology is used to realize the antennas. The antenna patches are suspended on a thin dielectric SiN/sub x/ membrane on GaAs substrate. Therefore a novel plasma-enhanced chemical vapor deposition (PECVD) process step for the fabrication of the membranes is developed and described. The single antenna patches are coupled to a microstrip line through an aperture in the ground metallization. The method of moments in spectral domain is applied to design the patches. The feed network of a 3 x 1 antenna array for homogeneous excitation is simulated and optimized with a microwave design system (MDS). From reflection measurements the operation frequency of this triple patch antenna is determined to be 77.6 GHz. The farfield antenna characteristics are measured in an anechoic chamber, showing good agreement between simulated and measured results and a co- to cross-polarization isolation better than 30 dB.

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