Abstracts

Micromachined W-Band Filters

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Results are presented for high performance planar W-band filters based on silicon micromachining techniques common in microsensor fabrication. Two types of micromachined planar transmission lines are studied: microshield line and shielded membrane microstrip (SMM) line. In both of these structures, the conducting lines are suspended on thin dielectric membranes. These transmission lines are essentially "floating" in air, possess negligible levels of dielectric loss, and do not suffer from the parasitic effects of radiation and dispersion. A 90 GHz low pass filter and several 95 GHz bandpass filters are tested and display excellent performance which cannot be achieved with traditional substrate supported circuits in CPW or microstrip configurations. A full-wave finite-difference time-domain (FDTD) technique verifies the measured performance of the W-band circuits and provides a basis for comparison between the performances of membrane supported circuits and equivalent substrate supported circuits.

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