Abstracts

Development and Evaluation of a GaAs MMIC Phase-Locked Loop Chip Set for Space Applications (Short Papers)

J. Archer, B.M. Smith, G.R. Weaver, H. Wong and J.Y. Yonemura. "Development and Evaluation of a GaAs MMIC Phase-Locked Loop Chip Set for Space Applications (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 790-792.

GaAs monolithic microwave integrated circuit (MMIC) chips designed for a phase-locked loop frequency source to be used in space applications have been developed. The chip set includes a three-stage resistive feedback amplifier (RFA) with 13 dB gain in a 275 MHz to 5.85 GHz bandwidth, a 2.0 GHz voltage-controlled oscillator (VCO), a 2.8 GHz digital prescaler, and a VHF/UHF digital phase/frequency discriminator. Both analog and buffered-FET logic (BFL) digital circuits were fabricated on the same wafer. The MMIC process which was developed for this application comprises molecular beam epitaxial (MBE) deposition of the active layer, proton isolation, submicron gates, thin-film TaN resistor deposition, and silicon nitride passivation. The chip set was used successfully to implement a 2.0 GHz all-GaAs phase-locked loop (PLL).

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