Abstracts

Suppression of leakage resonance in coplanar MMIC packages using a Si sub-mount layer

Sung-Jin Kim, Ho-Sung Yeon and Hai-Young Lee. "Suppression of leakage resonance in coplanar MMIC packages using a Si sub-mount layer." 2000 Transactions on Microwave Theory and Techniques 48.12 (Dec. 2000 [T-MTT] (Special Issue on 2000 International Microwave Symposium)): 2664-2669.

In this paper, we examined the parasitic leakage resonance of coplanar monolithic microwave and millimeter-wave integrated circuits (MMICs) by the finite-difference time-domain calculations and experiments. The results show that leakages from coplanar MMICs become significantly resonant in finite substrates and packaging enclosures. In order to avoid the leakage resonance, a resonance suppression method using a doped-Si sub-mount layer is proposed and experimented in a frequency range from 0.5 to 40 GHz. The resonance suppression scheme is verified by measuring the S-parameters of the fabricated conductor-backed coplanar waveguides having an Si sub-mount layer of different resistivities (1 m/spl Omega//spl middot/cm, 15 /spl Omega//spl middot/cm, and 4 k/spl Omega//spl middot/cm). The leakage resonance can be completely suppressed using the typical 15 /spl Omega//spl middot/cm Si sub-mount layer.

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