Abstracts

A 0.18 /spl mu/m foundry RF CMOS technology with 70 GHz F/sub t/ for single chip system solutions

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This paper presents a high performance RF CMOS technology with a complete portfolio of RF and base band components for single-chip systems. Using optimized CMOS topology and deep n-well isolation, we obtain a F/sub t/ of 60 GHz and F/sub max/ of 55 GHz at 10 mA, a F/sub t/ of 70 GHz and F/sub max/ of 58 GHz at maximum-transconductance bias, and minimum noise figure of 1.5 dB without ground-shielded signal pad. High quality-factor inductors are obtained using Cu interconnect giving a quality factor of 18 at 1.7 nH. MIM capacitors, as well as accumulation and junction varactors are also optimized for enhancing quality factor. For the purpose of eliminating inter-block coupling noise penetrating through substrate, a deep n-well isolation and p-ring have been adopted to suppress the substrate noise by 25 dB and 10 dB respectively. This technology provides a complete solution for single-chip wireless systems.

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