Abstracts

1.9 GHz/5.8 GHz-band on-chip matching Si-MMIC low noise amplifiers fabricated on high resistive Si substrate

M. Ono, N. Suematsu, S. Kubo, Y. Iyama, T. Takagi and O. Ishida. "1.9 GHz/5.8 GHz-band on-chip matching Si-MMIC low noise amplifiers fabricated on high resistive Si substrate." 1999 Radio Frequency Integrated Circuits (RFIC) Symposium 99. (1999 [RFIC]): 189-192.

The use of high resistivity Si substrates, instead of the conventional low resistivity Si substrate, enables one to reduce the loss of spiral inductor for the on-chip matching circuit by 61% at 1.9 GHz and by 78% at 5.8 GHz and to improve gain and noise performance of the BJT. These improvements are explained as the reduction of dielectric loss of substrate by referring to equivalent circuit model extraction. The fabricated 1.9 GHz-band on-chip matching LNA performs 13.4 dB gain, 1.9 dB NF with 2 V, 2 mA DC power and 5.8 GHz-band LNA performs 6.9 dB gain, 3.3 dB NF with 3 V, 3 mA DC power.

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