Abstracts

Self-assembling MEMS variable and fixed RF inductors

V.M. Lubecke, B. Barber, E. Chan, D. Lopez, M.E. Gross and P. Gammel. "Self-assembling MEMS variable and fixed RF inductors." 2001 Transactions on Microwave Theory and Techniques 49.11 (Nov. 2001 [T-MTT] (Special Issue on the 2000 Asia-Pacific Microwave Conference)): 2093-2098.

Inductors play a key role in wireless front-end circuitry, yet are not generally well suited for conventional RF integrated-circuit (RFIC) fabrication processes. We have developed inductors that can be fabricated on a conventional RFIC silicon substrate, which use warping members to assemble themselves away from the substrate to improve quality factor (Q) and self-resonance frequency (SRF), and to provide a degree of variation in inductance value. These self-assembling variable inductors are realized through foundry provided microelectromechanical systems (MEMS) processing and have demonstrated temperature stable Q values greater than 13, SRF values well above 15 GHz, and inductance variations greater than 18%. Simulations suggest the potential for Q values above 20 and inductance variations greater than 30%, with optimized processing.

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