Abstracts

A Ka-band micromachined low-phase-noise oscillator

A.R. Brown and G.M. Rebeiz. "A Ka-band micromachined low-phase-noise oscillator." 1999 Transactions on Microwave Theory and Techniques 47.8 (Aug. 1999 [T-MTT] (Mini-Special Issue on Low-Power/Low-Noise Technologies for Mobile Wireless Communications)): 1504-1508.

A low-phase-noise 28.65 GHz oscillator has been demonstrated using a planar resonator. The resonator is micromachined close to the transistor and has an unloaded Q of 460. The oscillator uses a commercially available high electron mobility transistor (HEMT) for the active device, and results in an output power of 0.6 dBm with a 5.7% DC-RF efficiency. The measured phase noise is -92 dBc/Hz at a 100 kHz offset frequency and -122 dBc/Hz at 1 MHz offset frequency. This is compared with a low-Q planar design showing a 10 dB improvement in phase noise. The micromachined resonator is competitive with other hybrid nonplanar technologies, such as dielectric resonators.

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