Abstracts

A 2-GHz subharmonic sampler for signal downconversion

A. Parssinen, R. Magoon, S.I. Long and V. Porra. "A 2-GHz subharmonic sampler for signal downconversion." 1997 Transactions on Microwave Theory and Techniques 45.12 (Dec. 1997, Part II [T-MTT] (1997 Symposium Issue)): 2344-2351.

Subharmonic sampling is a discrete-time solution to the signal downconversion problem. It can be used either to replace a traditional continuous-time mixer in a superheterodyne receiver or can be combined with other discrete-time analog signal processing blocks in novel receiver architectures. We present a 2-GHz bandwidth integrated mixer based on subharmonic sampling operating at sampling frequencies from 40 MHz to 1.5 GHz. The conversion efficiency is optimized by appropriate choice of the clock duty cycle. The sampler uses a two-diode topology with a 3-V supply. The downconversion loss for the passive sampler is 1 dB and the total system gain 3 dB, The mixer achieves IIP3 of +16-dBm and -1-dB compression +7 dBm for a single-tone input. The circuit was implemented with a 0.6-/spl mu/m GaAs metal-semiconductor field effect transistor (MESFET) process.

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