Abstracts

Measurement and Model for Correlating Phase and Baseband 1/f Noise in an FET

R.D. Martinez, D.E. Oates and R.C. Compton. "Measurement and Model for Correlating Phase and Baseband 1/f Noise in an FET." 1994 Transactions on Microwave Theory and Techniques 42.11 (Nov. 1994 [T-MTT]): 2051-2055.

Phase noise in solid state oscillators arises in part from residual phase noise in the active device that provides gain. The device's residual phase noise is usually attributed to baseband noise on the bias that upconverts via a mixing process to generate phase noise around the carrier signaL This conclusion is consistent with the observation that baseband and carrier noise sources both have 1/f spectral properties. However, similar spectral properties are not sufficient to prove that the baseband and carrier noise are fully correlated. Experimental results presented here for a heterojunction FET show less than 40% correlation. To account for these observations a new l/f noise model is presented. This model is used to accurately predict the phase noise when a bias feedback circuit is added to stabilize the baseband fluctuations.

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