

“SiGe HBT nonlinear phase noise modeling – X-band amplifier design”

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Abstract – A nonlinear noise model of a SiGe bipolar transistor is presented. This model includes a nonlinear noise source and is able to predict the noise conversion phenomena in circuits using this transistor such as oscillator phase noise. It is based on two main low frequency noise sources, which are extracted thanks to noise measurements under large RF signal superposition. An original low phase noise X band amplifier is also presented. This amplifier features a phase noise performance of -160 dBrad². Hz⁻¹ at 10 kHz offset frequency together with a low consumption of 50mW.