Abstracts

A Low-Noise Baseband 5-GHz Direct-Coupled HBT Amplifier with Common-Base Active Input Match

K.W. Kobayashi and A.K. Oki. "A Low-Noise Baseband 5-GHz Direct-Coupled HBT Amplifier with Common-Base Active Input Match." 1994 Microwave and Guided Wave Letters 4.11 (Nov. 1994 [MGWL]): 373-375.

This paper reports on an HBT direct-coupled 2-stage amplifier that uses active common-base input matching to provide multi-decade frequency performance from dc to 5 GHz. This work benchmarks the first reported HBT noise results of an HBT amplifier using common-base active input matching. The 2-stage amplifier consists of a common-base input stage that is directly coupled to a Darlington feedback amplifier output stage. The common-base input can be bias tuned to achieve > 13-dB return loss at 3 GHz and a minimum noise figure of 2.9 dB at 1 GHz. A gain of 17.5 dB with a 3-dB bandwidth greater than 5 GHz was achieved under low-noise input bias. This amplifier topology can be implemented without the use of a complex microwave process, which typically integrates backside vias and microstrip matching components. The compact amplifier consumes an area of 0.82 x 0.47 mm^2, which is 10 times smaller than a previously reported 2.5-4 GHz narrow-band passive matched HBT amplifier with similar noise and gain performance.

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