Abstracts

A Novel HBT Distributed Amplifier Design Topology Based on Attenuation Compensation Techniques (1994 [MCS])

K.W. Kobayashi, R. Esfandiari and A.K. Oki. "A Novel HBT Distributed Amplifier Design Topology Based on Attenuation Compensation Techniques (1994 [MCS])." 1994 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 94.1 (1994 [MCS]): 179-182.

We report on a novel HBT distributed amplifier (DA) design which achieves the highest gain-bandwidth product (GBP) per device f/sub T/ so far reported for HBT distributed amplifiers. This paper introduces a new design topology for HBT DA's which incorporates attenuation compensation on both the input and output transmission lines. A four-section HBT DA using this novel topology achieves a gain of 15 dB and a 3-dB bandwidth of > 15 GHz. The resulting gain-bandwidth product is 84 GHz. When normalized to the device f/sub T/, this DA achieves the highest normalized gain-bandwidth-product figure of merit for HBT DA's, = 3.67, which is a 55 % improvement over existing state-of-the-art performance. The new device configuration offers 15-20 dB more available gain for the device unit cell and results in gain-bandwidth product improvements of 200 % over a conventional common-emitter DA configuration.

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