Abstracts

Low-Noise, Low Power Dissipation GaAs Monolithic Broad-Band Amplifiers (Short Papers)

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Low-noise, low dc power dissipation GaAs monolithic amplifiers have been developed for use in VHF-UHF mobile radio systems. The developed amplifiers have two-stage constuction, where gate width for the first stage is 1000 µm, and for the second stage is 500 pm. Using this circuit configuration, both noise figure and bandwidth have been improved. To maintain the uniformity for the ion-implanted active layers and to reduce gate-source resistance R/sub S/ and gate-drain resistance R/sub D/, the "closely spaced electrode FET" was adopted. The FET enables low drain voltage operation, resulting in low dc power dissipation. The developed amplifier for the FET threshold voltage VT= --0.6 V provides a 3-dB noise figure, less than 170-mW dc power dissipation, 9-MHz-3.9-GHz bandwidth with 16-dB gain. It can operate under a unipolar power source. When external choke inductors were introduced for the amplifier, 120-mW dc power dissipation has been achieved. It has also been demonstrated that the amplifier for V/sub T/= --0.6V, which is inferior to the amplifier for VT= -2.7V regarding gain-bandwidth product and power efficiency under the same dc power dissipation, however, has an acceptable performance for use in the mobile radio systems.

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