Abstracts

Low-frequency noise characteristics of self-aligned AlGaAs/GaAs HBTs with a noise corner frequency below 3 kHz (1997 [RFIC])

Jin-Ho Shin, Jiyoung Kim, Yujin Chung, Joonwoo Lee, Kyu Hwan Ahn and Bumman Kim. "Low-frequency noise characteristics of self-aligned AlGaAs/GaAs HBTs with a noise corner frequency below 3 kHz (1997 [RFIC])." 1997 Radio Frequency Integrated Circuits (RFIC) Symposium 97. (1997 [RFIC]): 185-188.

We have investigated the surface recombination and its 1/f noise properties of AlGaAs/GaAs HBT's as a function of the emitter-base structure and the surface passivation condition. It is found that the surface recombination 1/f noise can be significantly reduced by the heterojunction launcher of the abrupt junction with 30% Al mole fraction emitter. The depleted AlGaAs ledge surface passivation further suppresses the surface recombination currents. Consequently, we have achieved a very low 1/f noise corner frequency of 2.8 kHz at the collector current density of 10 kA/cm/sup 2/. The dominant noise source of the HBT is not a surface recombination current, but a bulk current noise. This is the lowest 1/f noise corner frequency among the III-V compound semiconductor devices, and comparable to those of low-noise Si BJTs.

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