Abstracts

Temperature-dependent noise parameters and modeling of InP/InAlAs/InGaAs HEMTs

M.R. Murti, L. Yoo, A. Raghavan, S. Nuttinck, J. Laskar, J. Bautista and R. Lai. "Temperature-dependent noise parameters and modeling of InP/InAlAs/InGaAs HEMTs." 2000 MTT-S International Microwave Symposium Digest 00.2 (2000 Vol. II [MWSYM]): 1241-1244.

In this paper, we present the small-signal and noise modeling of InP/ln/sub 0.8/Ga/sub 0.2/As HEMTs at cryogenic temperatures. The effect of various physical mechanisms influencing the small-signal parameters, especially the RF transconductance and RF output resistance and their temperature dependence are discussed in detail. Accurate on-wafer noise parameter measurements are carried out on InP HEMTs from 300 K to 18 K and the variation of the equivalent noise temperatures of drain and source (T/sub d/ and T/sub g/) are modeled against temperature. A cryogenic LNA in the Ka-band with a noise temperature of 10 K has been demonstrated.

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