Abstracts

An Ultra-Low Noise Cryogenic Ka-Band InGaAs/InAlAs/InP HEMT Front-End Receiver

R. Lai, J.J. Bautista, B. Fujiwara, K.L. Tan, G.I. Ng, R.M. Dia, D. Streit, P.H. Liu, A. Freudenthal, J. Laskar and M.W. Pospieszalski. "An Ultra-Low Noise Cryogenic Ka-Band InGaAs/InAlAs/InP HEMT Front-End Receiver." 1994 Microwave and Guided Wave Letters 4.10 (Oct. 1994 [MGWL]): 329-331.

We present here the design and performance of a 4-stage Ka-band cryogenic amplifier using a front-end 0.1µm gate length InP HEMT. The amplifier demonstrated 20-25 K uncorrected noise temperature (~0.3-dB noise figure) from 31-33 GHz with 30-33 dB associated gain at 12 K ambient temperature. To date, this is the best reported HEMT cryogenic amplifier performance at this frequency band and is a factor of two improvement in noise temperature compared to previous designs.

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