Abstracts

Optoelectronic mixing in three-terminal InP/InGaAs heterojunction bipolar transistors

C.P. Liu, Y. Betser, A.J. Seeds, D. Ritter and A. Madjar. "Optoelectronic mixing in three-terminal InP/InGaAs heterojunction bipolar transistors." 1997 MTT-S International Microwave Symposium Digest 1. (1997 Vol. I [MWSYM]): 359-362.

A three-terminal InP/InGaAs heterojunction bipolar transistor (HBT) with optical access has been fabricated and used in an optoelectronic mixer (OEM) configuration. Leakage of the photogenerated RF signal from the HBT base was identified as a cause of reduced mixed IF output power. By using a 3-stub tuner to present a high impedance to the base at signal frequency, over 5 dB improvement in the IF power was obtained resulting in a -4.7 dB system conversion gain. This result is the highest yet reported for a three-terminal HBT OEM and over 16 dB better than for a high quality photodiode/double-balanced mixer combination.

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