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Millimeter Wave Indium Phosphide Heterojunction Bipolar Transistors: Noise Performance and Circuit Applications

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Abstract
The performance of III-V heterojunction bipolar transistors (HBTs) has improved significantly over the past two decades. Today's state of the art Indium Phosphide (InP) HBTs have a maximum frequency of oscillation greater than 800 GHz and have been used to realize an amplifier operating above 600 GHz . In comparison to silicon (Si) based devices, III-V HBTs have superior transport properties that enables a higher gain, higher speed, and noise performance, and much higher Johnson figure-of-merit . From this perspective, the InP HBT is one of the most promising candidates for high performance mixed signal electronic systems.

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