

High-Power, High-Efficiency Cell Design for 26 GHz HBT Power Amplifier

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We describe a 6-chip combination HBT power amplifier and a single-cell chip with excellent power-added efficiency (PAE) and power density at 24-26 GHz. The power amplifier, based on our conventional chip design, exhibited 2.2 W output power with 19 % PAE and 5 dB linear gain. To further improve the efficiency and power-density, various types of HBT cells were characterized. The optimum cell (184 μm^2) exhibited 740 mW output power equivalent to power density of 4.0 mW/ μm^2 , while a record high PAE of 42% was obtained. These results compare well with the best data reported at lower frequency bands (<18 GHz), thereby showing great potential for high-power, high-efficiency HBTs in near mmWave bands.

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