

## Cascode connected AlGaIn/GaN HEMTs on SiC substrates

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We report on the fabrication and characteristics of cascode-connected AlGaIn/GaN HEMTs. The HEMTs were realized using Al/sub 0.3/Ga/sub 0.7/N/GaN heterostructures grown on 6-N semi-insulating SiC substrates. The circuit reported here employs a common source device having a gate length of 0.25  $\mu\text{m}$  cascode connected to a 0.35  $\mu\text{m}$  common gate device. The gate width of each device is 250  $\mu\text{m}$ . The fabricated circuit exhibited a current density of 800 mA/mm and yielded an  $f_{\text{sub T}}$  and  $f_{\text{sub max}}$  of 24.5 and 56 (extrapolated) GHz, respectively. Large signal measurements taken at 4 GHz produced 4 W/mm saturated output power at 36% power-added efficiency. Comparisons to the performance of a 250  $\mu\text{m}$  / 0.35  $\mu\text{m}$  / 3 common source device taken from the same wafer show that the cascode configuration has 7 dB more linear gain and 3 dB more compressed gain than the common source device at 4 GHz.

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