

# **Fabrication Technology and Device Performance of Sub-50-nm-Gate InP-Based HEMTs**

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## **Abstract**

Sub-50-nm-gate InAlAs/InGaAs high electron mobility transistors (HEMTs) lattice-matched to InP substrates were fabricated. Our method of fabrication includes the two-step-recess gate technology and a low temperature process, applied at below 300°C. We succeeded in fabricating ultra-short 25-nm-long T-shaped-gates. RF measurements showed that the cutoff frequency  $f_T$  of a 25-nm-gate HEMT is 396 GHz, and this is the highest value yet reported for any type of transistor.