

# Abstracts

## A 230-Watt S-Band SiGe Heterojunction Bipolar Transistor

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*P.A. Potyraj, K.J. Petrosky, K.D. Hobart, F.J. Kub and P.E. Thompson. "A 230-Watt S-Band SiGe Heterojunction Bipolar Transistor." 1996 Transactions on Microwave Theory and Techniques 44.12 (Dec. 1996, Part II [T-MTT] (1996 Symposium Issue)): 2392-2397.*

Large-area Si/Si<sub>1-x</sub>Ge<sub>x</sub> heterojunction bipolar transistors (HBT's) have been demonstrated with record output power at S-Band. Under pulsed conditions in class C operation, a saturated power in excess of 230 W was achieved at 2.8 GHz. At 200 W the devices exhibited a collector efficiency of 46% and a power gain of 6.9 dB. Devices with implanted Si bases had comparable gain, but only 3570 efficiency at 150 W, and saturated at 180 W. In class A operation, 13.5 dB gain was demonstrated at 3.1 GHz on smaller devices. For high  $f_{\text{max}}$ , a self-aligned silicided polysilicon-emitter structure was used in conjunction with a graded Si<sub>1-x</sub>Ge<sub>x</sub> base. Variable temperature dc tests and accelerated life tests have indicated no reliability problems. The results indicate for the first time that Si/SiGe HBT's are suitable for high-power, high-frequency applications.

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