Abstracts

Ka-Band GaAs HBT PIN Diode Switches and Phase Shifters (1994 Vol. I [MWSYM])

D. Teeter, R. Wohlert, B. Cole, G. Jackson, E. Tong, P. Saledas, M. Adlerstein, M. Schindler and S. Shanfield. "Ka-Band GaAs HBT PIN Diode Switches and Phase Shifters (1994 Vol. I [MWSYM])." 1994 MTT-S International Microwave Symposium Digest 94.1 (1994 Vol. I [MWSYM]): 451-454.

In this paper, we present results on millimeter-wave PIN diode switch arms and phase shifters fabricated in our HBT process line. The PIN diode is formed by the base-collector junction of the HBT and is therefore completely compatible with our conventional HBT process. A SPST switch arm exhibited 0.7 dB insertion loss and 21 dB isolation at 35 GHz. A high power version of this switch was capable of handling 29.5 dBm input power with less than 1 dB insertion loss at 17 V reverse bias. Low-pass/high-pass phase shifter bits with relative phase shifts of 45, 90, and 180 ± 10 degrees up to 36 GHz have also been demonstrated using HBT PIN diodes as switching elements. To our knowledge, this is the first demonstration of HBT PIN diode circuits at Ka-band. A detailed discussion of the circuit designs and measurements are given in the paper.

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