Abstracts

A 100-Element HBT Grid Amplifier (1993 Vol. II [MWSYM])

M. Kim, E.A. Sovero, J.B. Hacker, M.P. De Lisio, J.-C. Chiao, S.-J. Li, D.R. Gagnon, J.J. Rosenberg and D.B. Rutledge. *"A 100-Element HBT Grid Amplifier (1993 Vol. II [MWSYM])." 1993 MTT-S International Microwave Symposium Digest 93.2 (1993 Vol. II [MWSYM]): 615-618.*

A 100-element 10-GHz grid amplifier has been developed. The active devices in the grid are chips with heterojunction bipolar transistor (HBT) differential pairs that include a resistive network to provide self-bias to the base. The planar metal grid structure was empirically designed to provide effective coupling between the HBT's and free space. Two independent measurements, one with focusing lenses, the other without, were used to measure the gain of the grid. In each case, the peak gain of the grid was 10 dB at 10 GHz with a 3 dB bandwidth of 1 GHz. The input and output matches are better than 15 dB at 10 GHz. The maximum output power is 450 mW, and the minimum noise figure is 7 dB. Tests show that the grid is quite tolerant of failures--the output power dropped by only 1 dB when the 10% of the inputs were detuned. The device amplifies beams with incidence angles up to 30° with less than a 3-dB drop in power.

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