Abstracts

Ka-Band Solid State Power Amplifier

F.J. Bayuk and J.E. Raue. "Ka-Band Solid State Power Amplifier." 1977 MTT-S International Microwave Symposium Digest 77.1 (1977 [MWSYM]): 29-31.

A technology development is described which has clearly advanced the state-of-the-art in high power, high performance solid state amplifiers. Five watts of output power at 37 GHz were achieved with a five-stage amplifier. Three stages operate in the negative resistance mode with 2 GHz of bandwidth, the final two stages are injection locked. The total amplifier gain is 33 dB. High efficiency power combining is used in the two power stages. Extensive use has been made of computer aided design, both in the negative resistance amplifier development and in the modeling and optimization of the multiple diode power combining structures. Novel broadband circulators couple the individual stages and provide interstage isolation with insertion loss levels of 0.1 dB per path. The entire amplifier, including diode current regulators, is enclosed in a housing 6 x 8 x 3 inches in size, and weighs 9 pounds.

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