Abstracts

Enhanced Performance in GaAs TUNNETT Diode Oscillators above 100GHz through Diamond Heat Sinking and Power Combining (1994 Vol. II [MWSYM])

H. Eisele and G.I. Haddad. "Enhanced Performance in GaAs TUNNETT Diode Oscillators above 100GHz through Diamond Heat Sinking and Power Combining (1994 Vol. II [MWSYM])." 1994 MTT-S International Microwave Symposium Digest 94.2 (1994 Vol. II [MWSYM]): 767-769.

Singte-drift GaAs TUNNETT diodes on integral heat sinks exhibit no sign of saturation in RF output power nor efficiency and are thought to be themally limited. Therefore, diodes from the same MBE material were fabricated using a different selective etching technology and mounted on diamond heat sinks for improved heat dissipation. RF output power levels of over 80 mW with corresponding dc to RF conversion effciencies of 5.2 % were measured between 104 GHz and 107 GHz. To further increase the available RF output power, two TUNNETT diodes were power combined using two radial line full height waveguide cavities. The combined RFoutput power was 46 mW at 102.3 GHz from two diodes on integral heat sinks and 96.5 mW at 105.9 GHz from two diodes on diamond heat sinks with corresponding combining efficiencies of 80% and more.This is the first successful demonstration of power combining with TUNNETT diodes and the power levels and efficiencies from either single or combined devices are the highest reported to date from any devices made of III-V materials (e.g., GaAs and InP).

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