Abstracts

GaAs TUNNETT Diodes on Diamond Heat Sinks for 100 GHz and Above (Short Papers)

H. Eisele and G.I. Haddad. "GaAs TUNNETT Diodes on Diamond Heat Sinks for 100 GHz and Above (Short Papers)." 1995 Transactions on Microwave Theory and Techniques 43.1 (Jan. 1995 [T-MTT]): 210-213.

Single-drift GaAs TUNNETT diodes were mounted on diamond heat sinks for improved thermal resistance and evaluated around 100 GHz in a radial line full height waveguide cavity. The diodes were fabricated from MBE-grown material originally designed for diodes that operate in CW mode around 100 GHz on integral heat sinks. An RF output power of more than 70 mW with a corresponding dc to RF conversion efficiency of 4.9% was obtained at 105.4 GHz. This is the first successful demonstration of GaAs TUNNETT diodes mounted on diamond heat sinks. To the authors' knowledge, these dc to RF conversion efficiencies and RF power levels are the highest reported to date from TUNNETT diodes and exceed those of any single discrete device made of group III-V materials (GaAs, InP, etc.) at this frequency. Free-running TUNNETT diode oscillators exhibit clean spectra with an excellent phase noise of less than -94 dBc/Hz, measured at a frequency off-carrier of 500 kHz and an RF output power of 40 mW.

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