Abstracts

Power generation of millimeter-wave SiC avalanche transit time oscillator at high temperature

C.C. Meng and G.Z. Liao. "Power generation of millimeter-wave SiC avalanche transit time oscillator at high temperature." 1997 MTT-S International Microwave Symposium Digest 2. (1997 Vol. II [MWSYM]): 963-966.

For the first time, millimeter-wave SiC (Silicon Carbide) IMPATT oscillator was analyzed at 500 K and 800 K with temperature dependent ionization rates and saturation velocity. The large signal simulations demonstrate the fact that SiC IMPATT devices have efficiency and power advantage over Si and GaAs IMPATT devices at millimeter-wave frequencies. The efficiencies (and d.c. power density) at 800 K for depletion widths of 0.25 /spl mu/m (200 GHz), 0.5 /spl mu/m (100 GHz) and 1 /spl mu/m (50 GHz) are 12.4% (6.7 MW/cm/sup 2/), 15% (4.5 MW/cm/sup 2/) and 15.8% (3.3 MW/cm/sup 2/), respectively, for p/sup +/n single-drift flat-profile structures.

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