Abstracts

Frequency-Versus-Temperature Stabilization in Avalanche Transit-Time Oscillators by Use of Diode Parasitic Elements (Correspondence)

B.E. Sigmon. "Frequency-Versus-Temperature Stabilization in Avalanche Transit-Time Oscillators by Use of Diode Parasitic Elements (Correspondence)." 1970 Transactions on Microwave Theory and Techniques 18.11 (Nov. 1970 [T-MTT] (Special Issue on Microwave Circuit Aspects of Avalanche-Diode and Transferred Electron Devices)): 971-973.

Analyses of the packaged-diode-series resonant and antiresonant conditions of oscillation show that the antiresonant condition exhibits frequency versus temperature stability which is greatly improved as compared with that of the resonant condition. Frequency variation with temperature in coaxial-cavity avalanche transit-time oscillators is predominantly due to diode junction capacitance and cavity-length changes with temperature. By operation of the oscillator in the antiresonant condition, the effects of both the diode junction capacitance and the cavity-length changes with temperature are greatly reduced as compared with those observed in the resonant condition of oscillation. (The circuit will oscillate for line lengths intermediate to resonance and antiresonance; however, the temperature coefficient will depend on the extent to which the element C/sub a/ is shunted by the line.)

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