Abstracts

An inter-subband device with terahertz applications

P.D. Buckle, P. Dawson, M.A. Lynch, Chun-Yi Kuo, M. Missous and W.S. Truscott. "An inter-subband device with terahertz applications." 2000 Transactions on Microwave Theory and Techniques 48.4 (Apr. 2000, Part II [T-MTT] (Special Issue on Terahertz Electronics)): 632-638.

A theoretical analysis of a modulator based on two coupled resonators is presented in this paper. This modulator exhibits a resonant enhancement in its response. It is used as a component of tunneling structures designed for operation at terahertz frequencies; unlike conventional resonant tunneling structures, these use triple barriers. Data from optical and electrical measurements on a series of devices based on one design of a triple-barrier tunneling structure have been analyzed to estimate their behavior at frequencies over 1 THz. The analysis gives values for the resonantly enhanced admittance, its bandwidth, the bias-frequency relationship, and the requirements for a matching circuit to a 50-/spl Omega/ environment. The results show that one existing structure might be used in oscillators working at 1 THz.

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