Abstracts

Surface-Oriented Transferred-Electron Devices (Dec. 1978 [T-MTT])

M.S. Shur and L.F. Eastman. "Surface-Oriented Transferred-Electron Devices (Dec. 1978 [T-MTT])." 1978 Transactions on Microwave Theory and Techniques 26.12 (Dec. 1978 [T-MTT] (1978 Symposium Issue)): 1023-1028.

The application of MESFET technology to the manufacturing of surface-oriented transferred-electron devices (TED's) with parmeters close to GaAs MESFET's is discussed. The limitations related to the contact resistance, fringing capacitance, domain formation time, impact ionization, and heat sinking are analyzed for GaAs and InP devices. Our estimates show that the surface-oriented devices can be used as microwave LSA generators at higher frequencies than the conventional LSA diodes. In a domain mode, the surface-oriented TED's can yield low values of the power-delay product comparable to those of GaAs MESFET's at higher speeds. The analysis of impact ionization within a high-field domain leads to a conclusion that even InP logic devices with practical lengths of the active layer can be manufactured with doping densities up to 10/sup 17/cm/sup -3/. The estimate of the temperature rise indicates that a CW operation is possible for practical device parameters. Because the parameters of surface-oriented TED's are similar to those of GaAs MESFET's they may be manufactured using the rapidly developing GaAs integrated-circuit technology and used in combination with GaAs MESFET's.

❑ Return to main document.