Abstracts

Microwave Semiconductor Control Devices

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Three topics on microwave semiconductor control devices are discussed: field effect transistors (FET's), switching speed and power, and millimeter-wave devices. This paper reviews present switching, limiting and phase modulating with FET's and proposes a new structure for switching with them. Present efforts to resolve the gap between theory and practice for present speed and power limitations are summarized and some definitions that are needed for specifying switching speed are suggested. Also, the state of the art of millimeter-wave switching and phase modulating is presented with the conclusions that waveguide reflection devices perform excellently up to 100 GHz, fin-line devices perform even better to 40 GHz and may be useful up to 100 GHz, and long distributed p-i-n junction devices in a dielectric waveguide are able to phase shift moderate power levels at frequencies above 100 GHz, but at relatively slow switching speeds.

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