Abstracts

Thermally Induced Switching and Failure in p-i-n RF Control Diodes

R.J. Chaffin. "Thermally Induced Switching and Failure in p-i-n RF Control Diodes." 1982 Transactions on Microwave Theory and Techniques 30.11 (Nov. 1982 [T-MTT]): 1944-1947.

This paper measures and analyzes a thermally induced, breakdown-like effect in p-i-n RF switching diodes. The effect is found to be due to thermally generated carriers increasing the I-region conductivity and loss. This is a positive feedback situation which, with increasing power levels, eventually causes the diode to switch to a low-impedance state. In the low-impedance state, further increases in temperature have a negative feedback effect on the absorbed power and hence this mode is stable with a very large hysteresis effect. Unfortunately, the high temperatures encountered in the low-impedance mode (~ 400°C) have a detrimental effect on diode reliability. The threshold power at which switching to this mode occurs can be increased somewhat by reverse biasing the diode or improving its heat sink.

❑ Return to main document.