J W Bandler

Late News!

SUPPLEMENT TO

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Session 13: Solid State Devices IV - Microwave Devices (B)

Thursday, Oct. 19, 1967, 2:15 to 5:15 p.m.
North Cotillion Room
Chairman: D. G. Dow
Organizer: J. Barrera

13.6 The Results of Precision Microwave Measurement of the Internal Parasitics of Tunnel-Diodes(1).

J. W. Bandler, University of Manitoba, Winnipeg, Canada.

This paper presents the results of precision microwave standing wave measurements using a superheterodyne technique from 4 to 11 GHz on the "internal" parasitics of tunnel-diodes terminating a coaxial-line. The difficulty in measuring the series resistance has led in the past to conflicting conjectures as to its variation with frequency, and hence to the resistive cut-off frequency. Considerable effort has, therefore, been devoted in this work to its accurate evaluation. Errors which could have arisen due to transmission-line attenuation and mount discontinuities were explicitly eliminated from the measured results. The frequency invariance of the series inductance and junction capacitance is verified; but a new variation of series resistance with frequency is proposed of the form $r = r_{dc} + (af)^2$, where r_{dc} and a are constant, in accordance with the experimental results. The effect of this variation on the resistive cut-off frequency is discussed, and a comparison is made with the relevant results of other researchers.

(1) This work was carried out by the author at Mullard Research Laboratories, Redhill, Surrey, England.