Abstracts

Theory of TEM Diode Switching

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The theory of TEM diode switching is presented for purpose of understanding and designing TEM microwave diode switches. A few experimental results are reported for the purpose of supporting the theory and demonstrating the exceptional bandwidth possible. An analysis is given of the switching action of one and of two or more diodes as well as the biasing of the center conductor of a TEM transmission line over broad-frequency bandwidths without interacting the RF signal. The use of point-contact germanium, and gold-bonded germanium diodes for TEM switching is discussed. Some considerations of switching speed and maximum power-handling capacity are given. A coaxial transmission line switch has been constructed in which two gold-bonded diodes provide 26-db or greater isolation and insertion ranging from 1.6 db to less than 1 db from 40 Mc to 4000 Mc. The addition of a bias lead should increase the insertion loss 0.4 db or less over the 100-to-1 bandwidth, the maximum increase being at the upper and lower bounds.

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