Abstracts

Behavior of Gunn Diode Oscillator with a Moving Reflector as a Self-Excited Mixer and a Load Variation Detector

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Behavior of a Gunn diode oscillator with a moving reflector is described. Two cases are considered: The oscillator acts as 1) self-excited mixer and 2) load variation detector. Analyses are carried out by using a simplified model of the dynamic current-voltage characteristic of the Gunn diode oscillator. Experiments have been also carried out. For case 1), an external signal was injected into the oscillator instead of the signal reflected by the reflector. For case 2), the effects of the moving reflector upon the oscillation frequency and dc current were investigated in the static condition. In 1), conversion gain greater than 20 dB has been obtained analytically and experimentally. In 2), it is shown that dc current and the oscillation frequency changes sinusoidally with the phase of reflection coefficient. We can obtain information about the moving reflector through the bias port of the oscillator in both cases.

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