

Excess Noise in Microwave Crystal Diodes Used As Rectifiers and Harmonic Generators

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Excess noise produced by microwave excitation of silicon crystal diodes was studied for operation of the crystal as a detector and as a microwave harmonic generator. The noise appears at the detector terminals and also as noise sidebands of the microwave harmonic, thus degrading the spectral purity of the harmonic relative to that of the fundamental. Possible models of the processes involved are presented. Difficulties and technique of measurement are discussed. Observations for 1N26 crystals, used as detectors, doublers, and triplers, and excited by X-band power in the range 8 to 100 mw are presented, showing limitations on spectral purity set by the process of noise production during harmonic generation.

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