

Investigations of mixers noises on semiconductor superlattices

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Application of diodes on semiconductor superlattices in mixers allows increasing their high operating frequency in comparison with mixers on Schottky diodes. It is known that mixers on semiconductor superlattices have higher output noises in comparison with mixers on Schottky diodes. It is explained by presence of carrier's negative mobility zone at volt-ampere characteristic of diodes on semiconductor superlattices. It is possible to increase output noises or optimize signal-to-noise rates of output signal in IF circuit by taking the working area on volt-ampere characteristic of diodes on semiconductor superlattices. The both modes have practice interest. The first mode is suitable for obtaining the uniform broadband noise. The second one is necessary for obtaining maximum signal-to-noise rate in the IF circuit. The experimental set for investigations of semiconductor superlattice mixers characteristics in THz-band was designed for study of these modes of semiconductor superlattices diodes. This set consists of the BWO signal source with PLL system of a band more the 0,7 THz and a heterodyne. The both signals were applied to the mixer on semiconductor superlattices diodes. The superlattice noises dependence on the signal power was taken in IF circuit.