Abstracts

Amplification by Interdigital Excitation of Space-Charge Waves in Semiconductors

H. Baudrand, T. El Khoury and D. Lilonga. "Amplification by Interdigital Excitation of Space-Charge Waves in Semiconductors." 1984 Transactions on Microwave Theory and Techniques 32.11 (Nov. 1984 [T-MTT]): 1434-1441.

A new concept of amplification of the electromagnetic (EM) wave as a consequence of its interaction with a space-charge wave in a semiconductor is analyzed. The EM wave is applied to an interdigital line which in turn excites a space-charge wave in a high-resistivity silicon. The theoretical calculations are carried out by means of the least-square boundary residual method, where a theoretical gain of 84 dB is obtained at synchronism of the third harmonic of the wave. The experimental device exhibits a net gain of 13 dB at synchronism. The mobility of the carriers in the semiconductor is deduced out of the experimental results.

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