Abstracts

An experimental study on a self-oscillating optoelectronic up-converter that uses a heterojunction bipolar transistor

H. Sawasa and N. Imai. "An experimental study on a self-oscillating optoelectronic up-converter that uses a heterojunction bipolar transistor." 1999 Transactions on Microwave Theory and Techniques 47.8 (Aug. 1999 [T-MTT] (Mini-Special Issue on Low-Power/Low-Noise Technologies for Mobile Wireless Communications)): 1515-1521.

This paper presents an experimental study on a self-oscillating optoelectronic up-converter (SOOEUP) that makes use of a heterojunction bipolar transistor for the first time. An SOOEUP can unify the functions of photodetection, oscillation, and frequency up-conversion, which are done separately in conventional systems. A response nearly equivalent to that of an optoelectronic up-converter (OEUP) using an external local oscillator is obtained for the fundamental component of the oscillation frequency. With an SOOEUP, the detected power can be higher than that of an OEUP, and this will help simplify the configuration of radio base stations in fiber-optic subcarrier transmission links, especially when the up-converted signal frequency is of the millimeter-wave band. A balanced SOOEUP that can suppress unwanted local-oscillation components is also described. Compared to a single SOOEUP, it improves the suppression ratio by over 40 dB.

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