Abstracts

Frequency-locked GaAs/AlAs superlattice oscillator for tunable narrowband microwave generation

K. Hofbeck, E. Schomburg, J. Grenzer, K.F. Renk, D.G. Pavel'ev, Yu. Koschurinov, B. Melzer, S. Ivanov and P.S. Kop'ev. "Frequency-locked GaAs/AlAs superlattice oscillator for tunable narrowband microwave generation." 1998 Microwave and Guided Wave Letters 8.12 (Dec. 1998 [MGWL]): 427-429.

We observed frequency locking of a wide-miniband GaAs/AlAs superlattice oscillator. The oscillator showed a free self-sustained current oscillation giving rise to microwave generation (power 100 /spl mu/W) at a natural frequency (near 5 GHz) and ultraharmonics. A narrowband driving field locked the oscillator and caused a drastic narrowing (from 10/sup 6/ Hz to less than 10 Hz) of the halfwidths of the microwave lines, now centered at the driving frequency and its harmonics; at a driving power of 10 /spl mu/W we obtained a locking range of 1% around the natural frequency. Our experiment, performed with a superlattice integrated in a planar microwave circuit, shows that a locked superlattice oscillator is suitable for tunable narrowband generation of high-frequency radiation.

❑ Return to main document.