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Title:Fundamental oscillation up to 1.08 THz in resonant tunneling diodes with high-indium-composition transit layers for reduction of transit delay

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Abstract:Fundamental oscillations up to 1.08 THz with the output power of 5.5 microwatts was achieved in GaInAs/AlAs resonant tunneling diodes (RTDs) at room temperature. The graded emitter, thin barriers, and high-indium-composition transit layers were introduced to reduce the tunneling and transit delays. The first two of these structures are the same as those in RTDs oscillating at 1.04 THz reported recently, and the last structure provided for further reduction of the transit time and increase in frequency due to suppression of the Γ -L transition and increment of the launching velocity.

Number of references:10

Inspec controlled terms:aluminium compounds - circuit oscillations - gallium arsenide - III-V semiconductors - indium compounds - resonant tunnelling diodes - transit time devices

Uncontrolled terms:fundamental oscillation - resonant tunneling diode - high-indium-composition transit layer - transit delay reduction - RTD - graded emitter - thin barrier - transit time reduction - Γ -L transition - launching velocity - power 5.5 mW - temperature 293 K to 298 K - frequency 1.04 THz - GaInAs-AlAs

Inspec classification codes:B2560H Junction and barrier diodes

Numerical data indexing:power 5.5E-03 W;temperature 2.93E+02 2.98E+02 K;frequency 1.04E+12 Hz

Chemical indexing:GaInAs-AlAs/int GaInAs/int AlAs/int Al/int As/int Ga/int In/int GaInAs/ss As/ss Ga/ss In/ss AlAs/bin Al/bin As/bin

Treatment:Practical (PRA)

Discipline:Electrical/Electronic engineering (B)

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