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United States Patent **5,825,240**
Geis , et al. **October 20, 1998**

Resonant-tunneling transmission line technology

Abstract

Resonant-tunneling transmission lines in the various architectures rely on discrete or continuous resonant-tunneling heterostructures to actively modify propagating logic signals. One embodiment utilizes amplification of logic signals to counteract ubiquitous losses and distortion associated with any transmission medium. Basically, the logic signal is incrementally reamplified and reshaped as it propagates along the transmission line. Another embodiment is directed to a clocking system that transmits a signal represented by a sinusoid. Then, in proximity to the logic gates or modules, the sinusoid is converted into a square wave that actually clocks the gates and other logic structures. The inventive active transmission line naturally performs this feature, thus enabling clock signal transmission over longer links coupled with sinusoid-to-square wave conversion in a limited area. Still other embodiments implement step or continuous variations in the physical width of the resonant-tunneling transmission line. By manipulating the transmission line width of successive sections of the line, isolation in addition to the logic operation of the input signals is achievable in a simple monolithic circuit design. Further embodiments are directed to oscillator circuits and the control of the characteristics of the generated periodic signal.

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Appl. No.: **08/916,829**

Filed: **August 22, 1997**

United States Patent **5,315,608**
Choi , et al. **May 24, 1994**

Holmium-doped solid state optically pumped laser

Abstract

An eye-safe short pulse room-temperature solid state laser emitting at about 2.1 microns is optically pumped by diode lasers emitting at about 1.9 microns Absorption spectra of Ho ions in YAG (Yttrium Aluminum Garnet) and YLF (Yttrium Lithium Fluoride) host crystals are described. Optical pumping is performed by high-power diode lasers emitting at about 1.91 microns consisting of a GaInAsSb/AlGaAsSb quantum-well active region and AlGaAsSb cladding layers grown on GaSb substrates.

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Appl. No.: **07/916,467**

Filed: **July 17, 1992**

United States Patent **5,251,225**
***Eglash*, et al.** **October 5, 1993**

Quantum-well diode laser

Abstract

A GaInAsSb quantum-well laser for highly efficient conversion of input energy to output infrared light is described. The laser consists of an MBE grown active region formed of a plurality of GaInAsSb quantum-well layers separated by AlGaAsSb barrier layers. The active region is sandwiched between AlGaAsSb cladding layers in which the Al content is greater than the Al content in the barrier layers.

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Appl. No.: **07/880,622**
Filed: **May 8, 1992**

United States Patent **5,122,222**
Turner , et al. **June 16, 1992**

Frequency-domain analysis of RHEED data

Abstract

Computerized acquisition and frequency-domain analysis of dynamic reflection high-energy electron diffraction (RHEED) intensity data is obtained during growth by molecular-beam epitaxy (MBE). Rapid, accurate determination of the frequency of RHEED oscillations can be obtained not only when these oscillations are well resolved, but also when the growth conditions yield oscillations that are too poorly resolved to permit frequency analysis by conventional procedures. The method has been used to study transients in the growth of AlGaAs on GaAs substrates and also to investigate the hetero-epitaxial growth of GaAs on Si.

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Appl. No.: **07/582,755**
Filed: **September 14, 1990**