

Title (en)
INTEGRATED WAVELENGTH TUNABLE SINGLE AND TWO-STAGE ALL-OPTICAL WAVELENGTH CONVERTER

Title (de)
INTEGRIERTER WELLENLAENGENABSTIMMBARER WELLENLAENGENWANDLER IN EIN ODER ZWEI STUFEN

Title (fr)
CONVERTISSEUR OPTIQUE DE LONGUEUR D'ONDE INTEGRE SIMPLE ET A DEUX ETAPES ACCORDABLE EN LONGUEUR D'ONDE

Publication
EP 1218988 A4 20051123 (EN)

Application
EP 00967013 A 20000928

Priority

- US 0026655 W 20000928
- US 15645999 P 19990928

Abstract (en)
[origin: WO0124329A1] A semiconductor tunable laser (10) and an interferometer (12) coupled to the tunable laser (10) are monolithically fabricated in a semiconductor heterostructure. The laser also comprises a buried ridge stripe waveguide laser. The interferometer (12) has a semiconductor optical amplifier (38) coupled in each arm. A cross-gain semiconductor optical amplifier converter is coupled to the interferometer (12). The semiconductor optical amplifier (38) coupled in each arm is biased so that an optical path length difference between the two arms is in antiphase which results in destructive interference. The output of the tunable laser (10) is coupled to a coupler. A semiconductor optical amplifier (38) is used as a gain controller for the semiconductor optical amplifiers in the interferometer (12) to allow wavelength conversion over a larger range of input signal powers. The heterostructure substrate comprises a low bandgap waveguide layer and thinner multi-quantum well active regions disposed above the low bandgap waveguide layer. The heterostructure substrate has nonabsorbing passive elements formed therein by selectively removing the quantum wells regions above the waveguide layer to allow formation of active and passive sections in the waveguide layer without having to perform a butt joint regrowth. The invention is also characterized as a method of fabricating an integrated optical device as disclosed above in the heterostructure substrate.

IPC 1-7
H01S 5/026

IPC 8 full level
G02F 2/02 (2006.01); **G02F 2/00** (2006.01); **H01S 5/026** (2006.01); **H01S 5/042** (2006.01); **H01S 5/062** (2006.01); **H01S 5/125** (2006.01); **H01S 5/34** (2006.01); **H04B 10/145** (2006.01); **H01S 5/00** (2006.01); **H01S 5/0625** (2006.01); **H01S 5/227** (2006.01); **H01S 5/50** (2006.01)

CPC (source: EP US)
G02F 2/004 (2013.01 - EP); **H01S 5/026** (2013.01 - EP US); **G02F 2/006** (2021.01 - EP); **H01S 5/005** (2013.01 - EP US); **H01S 5/02325** (2021.01 - EP); **H01S 5/06256** (2013.01 - EP); **H01S 5/2275** (2013.01 - EP); **H01S 5/5018** (2013.01 - EP); **H01S 5/5054** (2013.01 - EP)

Citation (search report)

- [XY] US 5781326 A 19980714 - CHIARONI DOMINIQUE [FR], et al
- [PX] WO 0052789 A2 20000908 - UNIV CALIFORNIA [US], et al
- [X] EP 0717482 A1 19960619 - AT & T CORP [US]
- [XY] PATENT ABSTRACTS OF JAPAN vol. 1997, no. 04 30 April 1997 (1997-04-30)
- [XY] MASON B ET AL: "WIDELY TUNABLE SAMPLED GRATING DBR LASER WITH INTEGRATED ELECTROABSORPTION MODULATOR", IEEE PHOTONICS TECHNOLOGY LETTERS, IEEE INC. NEW YORK, US, vol. 11, no. 6, June 1999 (1999-06-01), pages 638 - 640, XP000835422, ISSN: 1041-1135
- [Y] DAGENS B ET AL: "DESIGN OPTIMIZATION OF ALL-ACTIVE MACH-ZEHNDER WAVELENGTH CONVERTERS", IEEE PHOTONICS TECHNOLOGY LETTERS, IEEE INC. NEW YORK, US, vol. 11, no. 4, April 1999 (1999-04-01), pages 424 - 426, XP000830084, ISSN: 1041-1135
- [A] RAYBON G ET AL: "GAIN-SWITCHING OF DBR LASER MONOLITHICALLY INTEGRATED WITH ELECTROABSORPTION MODULATOR FOR RZ TRANSMISSION", ELECTRONICS LETTERS, IEE STEVENAGE, GB, vol. 28, no. 2, 16 January 1992 (1992-01-16), pages 188 - 190, XP000280613, ISSN: 0013-5194
- See references of WO 0124329A1

Designated contracting state (EPC)
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

DOCDB simple family (publication)
WO 0124329 A1 20010405; AU 7727500 A 20010430; AU 775671 B2 20040812; CA 2380374 A1 20010405; CN 1376326 A 20021023; EP 1218988 A1 20020703; EP 1218988 A4 20051123; JP 2003510664 A 20030318

DOCDB simple family (application)
US 0026655 W 20000928; AU 7727500 A 20000928; CA 2380374 A 20000928; CN 00813401 A 20000928; EP 00967013 A 20000928; JP 2001527410 A 20000928