

Title (en)

HYBRID PLANAR LIGHTWAVE CIRCUIT WITH REFLECTIVE GRATINGS

Title (de)

HYBRIDE PLANARE LICHTWELLENSCHALTUNG MIT REFLEKTIERENDEN GITTERN

Title (fr)

CIRCUIT OPTIQUE PLANAIRE HYBRIDE À RÉSEAUX RÉFLÉCHISSANTS

Publication

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Application

EP 07815949 A 20071003

Priority

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Abstract (en)

[origin: WO2008040125A1] The present document relates to a hybrid planar lightwave circuit (PLC) comprising a waveguide circuit chip (21) and a silicon reflective diffraction grating chip (29) which is mounted to the waveguide circuit chip (21), via a trench (27) formed in the waveguide circuit chip (21), wherein the waveguide circuit chip (21) comprises a high optical performance silica-on-silicon waveguide structure (22, 23, 24) formed on a silicon substrate (26) and wherein the silicon reflective diffraction grating chip (29) comprises a separate wafer grating substrate (31) and a reflective diffraction grating (28) formed therein. The reflective diffraction grating (28) is formed in the wafer grating substrate (31) using a highly accurate, deep reactive ion etching (DRIE) process thereby enabling a highly precise diffraction grating chip (29) to be fabricated. Consequently, the present hybrid planar lightwave circuit (PLC) includes a separately manufactured, highly precise, diffraction grating chip (29) and a separately manufactured, high quality, waveguide structure (22, 23, 24) onto which the diffraction grating chip (29) is mounted, thereby enabling both the use of new DRIE technologies in the processing of the diffraction grating chip (29) and the use of flip-chip bonding when performing the diffraction grating chip (29) mounting operation. The benefit of the disclosed diffraction grating-based, hybrid planar lightwave circuit (PLC) is that, not only is the device able to be fabricated with an equally complex configuration to that of prior art hybrid PLCs, the device is able to be fabricated more easily, using a technique (DRIE) that produces a very high-quality vertical etch with very low surface roughness. In particular, because the reflective diffraction grating chip (29) is fabricated separately, from silicon or like materials, the DRIE technique is able to be used, unlike prior art hybrid PLC fabrication methods which generally preclude the use of DRIE.

IPC 8 full level

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CPC (source: EP KR)

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Citation (search report)

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- [Y] US 2006093002 A1 20060504 - PARK MAHN Y [KR], et al
- [AD] US 2005213214 A1 20050929 - BIDNYK SERGE [CA], et al
- [A] JP 2003140101 A 20030514 - NIPPON TELEGRAPH & TELEPHONE
- See references of WO 2008040125A1

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