

ABSTRACT**SINGLE-MODE LASER AND INTEGRATION PROCESS FOR MAKING
THE SAME**

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The invention relates to a single-mode laser and an integration process for making the same. The integration process for making a single-mode laser, comprising steps of: fabricating a III-V semiconductor optical amplifier (SOA) (39) which includes an active layer (11); fabricating a silicon photonic (SiPh) waveguide (40) which
10 includes a passive waveguide layer (41) and an interlayer (26); flipping and aligning the SOA (39) with the waveguide (40) in a passive manner; and connecting the SOA (39) to the waveguide (40) by one or more flip-chip bumps (28), such that when said SOA (39) is powered an evanescent coupling is formed between the SOA (39) and the waveguide (40); characterised in that: the passive waveguide layer (41)
15 comprises a dielectric waveguide layer (24); and the step of fabricating the waveguide (40) also comprises a step of depositing a silicon waveguide layer (25) on the dielectric waveguide layer (24) by physical vapour deposition, such that when said SOA (39) is flipped and aligned with the waveguide (40), the silicon waveguide layer (25) is sandwiched between the SOA (40) and dielectric
20 waveguide layer (24).

(Fig. 2)