CLAIMS

1. An optical light source comprising:

a waveguide comprising two reflectors arranged spaced apart from each other to define an optical cavity therebetween;

an optical gain medium; and

a coupling structure arranged to couple light between the optical cavity and the optical gain medium,

wherein the coupling structure comprises an additional waveguide, the additional waveguide being arranged in contact with the optical gain medium,

wherein the waveguide comprises a first waveguide section and a second waveguide section spaced apart from the first waveguide section, and

wherein the coupling structure comprises:

a first coupling section arranged to couple light between the first waveguide section and the optical gain medium; and

a second coupling section spaced apart from the first coupling section, the second coupling section arranged to couple light between the second waveguide section and the optical gain medium.

2. The optical light source as claimed in claim 1, wherein the coupling structure is arranged spaced apart from the optical cavity.

3. The optical light source as claimed in claim 1, wherein the waveguide comprises a material capable of inducing a propagation loss of less than 2 dB/cm.

4. The optical light source as claimed in claim 1, wherein the waveguide comprises at least one of a silicon nitride-based material or silicon oxynitride-based material.

5. The optical light source as claimed in claim 1, wherein the coupling structure is embedded in the waveguide.

6. The optical light source as claimed in claim 1, wherein the coupling structure has a refractive index in between respective refractive indices of the waveguide and the optical gain medium.

7. The optical light source as claimed in claim 1, wherein the coupling structure has a thickness between about 50 nm and about 500 nm.

8. The optical light source as claimed in claim 1, wherein the coupling structure comprises amorphous silicon or poly-crystalline silicon.

9. The optical light source as claimed in claim 1, wherein the optical gain medium comprises a multiple quantum well region.

10. The optical light source as claimed in claim 1, wherein the optical gain medium comprises a cladding layer.

11. The optical light source as claimed in claim 10, wherein the cladding layer has a thickness between about 0.1 μm and about 1.5 μm.

12. The optical light source as claimed in claim 1, wherein a section of the optical gain medium is configured as a saturable absorber section.

13. The optical light source as claimed in claim 1, wherein the optical gain medium comprises a III-V material.

14. The optical light source as claimed in claim 1, wherein at least one of the two reflectors comprises a Bragg reflector.

15. The optical light source as claimed in claim 1, wherein at least one of the coupling structure or the optical gain medium comprises a tapering region.

16. The optical light source as claimed in claim 1,

wherein the first waveguide section and the first coupling section are arranged spaced apart from each other, and

wherein the second waveguide section and the second coupling section are arranged spaced apart from each other.

17. The optical light source as claimed in claim 1,

wherein the optical gain medium is arranged spaced apart from the first coupling section and the second coupling section.

18. An optical light source comprising:

a waveguide comprising two reflectors arranged spaced apart from each other to define an optical cavity therebetween;

an optical gain medium; and

a coupling structure arranged to couple light between the optical cavity and the optical gain medium,

wherein the waveguide comprises a first waveguide section and a second waveguide section spaced apart from the first waveguide section, and

wherein the coupling structure comprises:

a first coupling section arranged to couple light between the first waveguide section and the optical gain medium; and

a second coupling section spaced apart from the first coupling section, the second coupling section arranged to couple light between the second waveguide section and the optical gain medium.

CLAIMS

1. An optical light source comprising:

a waveguide comprising two reflectors arranged spaced apart from each other to define an optical cavity therebetween;

an optical gain medium; and

a coupling structure arranged to couple light between the optical cavity and the optical gain medium.

2. The optical light source as claimed in claim 1, wherein the coupling structure is arranged spaced apart from at least one of the optical cavity or the optical gain medium.

3. The optical light source as claimed in claim 1, wherein the waveguide comprises a material capable of inducing a propagation loss of less than 2 dB/cm.

4. The optical light source as claimed in claim 1, wherein the waveguide comprises at least one of a silicon nitride-based material or silicon oxynitride-based material.

5. The optical light source as claimed in claim 1, wherein the coupling structure is embedded in the waveguide.

6. The optical light source as claimed in claim 1, wherein the coupling structure has a refractive index in between respective refractive indices of the waveguide and the optical gain medium.

7. The optical light source as claimed in claim 1, wherein the coupling structure has a thickness between about 50 nm and about 500 nm.

8. The optical light source as claimed in claim 1, wherein the coupling structure comprises amorphous silicon or poly-crystalline silicon.

9. The optical light source as claimed in claim 1, wherein the optical gain medium comprises a multiple quantum well region.

10. The optical light source as claimed in claim 1, wherein the optical gain medium comprises a cladding layer.

11. The optical light source as claimed in claim 10, wherein the cladding layer has a thickness between about 0.1 μm and about 1.5 μm.

12. The optical light source as claimed in claim 1, wherein a section of the optical gain medium is configured as a saturable absorber section.

13. The optical light source as claimed in claim 1, wherein the optical gain medium comprises a III-V material.

14. The optical light source as claimed in claim 1, wherein at least one of the two reflectors comprises a Bragg reflector.

15. The optical light source as claimed in claim 1, wherein at least one of the coupling structure or the optical gain medium comprises a tapering region.

16. The optical light source as claimed in claim 1,

wherein the waveguide comprises a first waveguide section and a second waveguide section spaced apart from the first waveguide section, and

wherein the coupling structure comprises:

a first coupling section arranged to couple light between the first waveguide section and the optical gain medium; and

a second coupling section spaced apart from the first coupling section, the second coupling section arranged to couple light between the second waveguide section and the optical gain medium.

17. The optical light source as claimed in claim 16,

wherein the first waveguide section and the first coupling section are arranged spaced apart from each other, and

wherein the second waveguide section and the second coupling section are arranged spaced apart from each other.

18. The optical light source as claimed in claim 16,

wherein the optical gain medium is arranged spaced apart from the first coupling section and the second coupling section.

19. An optical light source comprising:

a waveguide comprising two Bragg reflectors arranged spaced apart from each other to define an optical cavity therebetween, wherein the waveguide comprises at least one of a silicon nitride-based material or silicon oxynitride-based material; and

an optical gain medium optically coupled to the optical cavity.

20. The optical light source as claimed in claim 19, further comprising a coupling structure arranged to couple light between the optical cavity and the optical gain medium.