CLAIMS

1. An optical modulator, comprising:

a depletion region comprising a junction between from a first conductivity type portion and a second conductivity type portion;

a first intrinsic region; and

a second intrinsic region; and

wherein the depletion region is disposed between the first intrinsic region and the second intrinsic region.

2. The optical modulator as claimed in claim 1, wherein the first intrinsic region is configured to at least partially contact the first conductivity type portion of the junction and the second intrinsic region is configured to at least partially contact the second conductivity type portion of the junction.

3. The optical modulator as claimed in claim 1 or 2, wherein the first intrinsic region comprises a region doped with dopants of the first conductivity type at a concentration lower than a concentration of dopants provided in the first conductivity type portion of the junction.

4. The optical modulator as claimed in any one of claims 1 to 3, wherein the second intrinsic region comprises a region doped with dopants of the second conductivity type at a concentration lower than a concentration of dopants provided in the second conductivity type portion of the junction.

5. The optical modulator as claimed in any one of claims 1 to 4, wherein the first conductivity type portion and the second conductivity type portion of the junction are configured to have different widths.

6. The optical modulator as claimed in any one of claims 1 to 5, wherein the first conductivity type portion is configured to have a smaller width than a width of the second conductivity type portion.

7. The optical modulator as claimed in any one of claims 1 to 6, further comprising:

a first slab doped with dopants of the first conductivity type, wherein the first slab is coupled to the first conductivity type portion of the junction; and

a second slab doped with dopants of the second conductivity type, wherein the second slab is coupled to the second conductivity type portion of the junction.

8. The optical modulator as claimed in claim 7, wherein the first slab comprises dopants at a concentration substantially equal or higher than a concentration of dopants in the first conductivity type portion of the junction.

9. The optical modulator as claimed in claim 7 or 8, wherein the second slab comprises dopants at a concentration substantially equal or higher than a concentration of dopants in the second conductivity type portion of the junction.

10. The optical modulator as claimed in any one of claims 1 to 9, further comprising a substrate, wherein the depletion region is disposed on the substrate, and wherein the junction of the depletion region is arranged at least substantially perpendicular to the substrate.

11. The optical modulator as claimed in any one of claims 1 to 9, further comprising a substrate, wherein the depletion region is disposed on the substrate, and wherein the junction of the depletion region is arranged at least substantially parallel to the substrate.

12. The optical modulator as claimed in any one of claims 1 to 11, wherein the depletion region is configured to form an active region of the modulator for propagation of an optical mode.

13. An optical modulator, comprising:

a depletion region comprising a junction between from a first conductivity type portion and a second conductivity type portion; and

an intrinsic region configured to substantially surround the depletion region.

14. The optical modulator as claimed in claim 13, wherein the first conductivity type portion and the second conductivity type portion of the junction are configured to have different widths.

15. The optical modulator as claimed in claim 13 or 14, wherein the first conductivity type portion is configured to have a smaller width than a width of the second conductivity type portion.

16. The optical modulator as claimed in any one of claims 13 to 15, further comprising:

a first slab doped with dopants of the first conductivity type, wherein the first slab is coupled to the first conductivity type portion of the junction; and

a second slab doped with dopants of the second conductivity type, wherein the second slab is coupled to the second conductivity type portion of the junction.

17. The optical modulator as claimed in claim 16, wherein the first slab comprises dopants at a concentration substantially equal or higher than a concentration of dopants in the first conductivity type portion of the junction.

18. The optical modulator as claimed in claim 16 or 17, wherein the second slab comprises dopants at a concentration substantially equal or higher than a concentration of dopants in the second conductivity type portion of the junction.

19. The optical modulator as claimed in any one of claims 13 to 18, further comprising a substrate, wherein the depletion region is disposed on the substrate, and

wherein the junction of the depletion region is arranged at least substantially perpendicular to the substrate.

20. The optical modulator as claimed in any one of claims 13 to 18, further comprising a substrate, wherein the depletion region is disposed on the substrate, and wherein the junction of the depletion region is arranged at least substantially parallel to the substrate.

21. The optical modulator as claimed in any one of claims 13 to 20, wherein the depletion region is configured to form an active region of the modulator for propagation of an optical mode.

CLAIMS

1. An optical modulator, comprising:

a depletion region comprising a junction between a first conductivity type portion and a second conductivity type portion, the first conductivity type portion and the second conductivity type portion being in contact with each other;

a first intrinsic region; and

a second intrinsic region; and

wherein the depletion region is disposed between the first intrinsic region and the second intrinsic region, and in contact with the first intrinsic region and the second intrinsic region,

wherein the first intrinsic region is in contact with the first conductivity type portion,

wherein the first intrinsic region comprises dopants of a first conductivity type and dopants of a second conductivity type, wherein a concentration of the dopants of the first conductivity type is higher than a concentration of the dopants of the second conductivity type,

wherein the second intrinsic region is in contact with the second conductivity type portion,

wherein the second intrinsic region comprises dopants of the first conductivity type and dopants of the second conductivity type, wherein a concentration of the dopants of the second conductivity type is higher than a concentration of the dopants of the first conductivity type, and

wherein the first conductivity type and the second conductivity type are opposite conductivity types.

2. The optical modulator as claimed in claim 1, wherein the concentration of the dopants of the first conductivity type in the first intrinsic region is lower than a concentration of dopants provided in the first conductivity type portion of the junction.

3. The optical modulator as claimed in claim 1, wherein the concentration of the dopants of the second conductivity type in the second intrinsic region is lower than a concentration of dopants provided in the second conductivity type portion of the junction.

4. The optical modulator as claimed in claim 1, wherein the first conductivity type portion and the second conductivity type portion of the junction are configured to have different widths.

5. The optical modulator as claimed in claim 1, wherein the first conductivity type portion is configured to have a smaller width than a width of the second conductivity type portion.

6. The optical modulator as claimed in claim 1, further comprising:

a first slab doped with dopants of the first conductivity type, wherein the first slab is coupled to the first conductivity type portion of the junction; and

a second slab doped with dopants of the second conductivity type, wherein the second slab is coupled to the second conductivity type portion of the junction.

7. The optical modulator as claimed in claim 6, wherein the first slab comprises dopants at a concentration substantially equal or higher than a concentration of dopants in the first conductivity type portion of the junction.

8. The optical modulator as claimed in claim 6, wherein the second slab comprises dopants at a concentration substantially equal or higher than a concentration of dopants in the second conductivity type portion of the junction.

9. The optical modulator as claimed in claim 1, further comprising a substrate, wherein the depletion region is disposed on the substrate, and wherein the junction of the depletion region is arranged at least substantially perpendicular to the substrate.

10. The optical modulator as claimed in claim 1, further comprising a substrate, wherein the depletion region is disposed on the substrate, and wherein the junction of the depletion region is arranged at least substantially parallel to the substrate.

11. The optical modulator as claimed in claim 1, wherein the depletion region is configured to form an active region of the modulator for propagation of an optical mode.

12. The optical modulator as claimed in claim 11, further comprising a substrate, wherein the depletion region is disposed on the substrate, and wherein the junction of the depletion region is arranged at least substantially perpendicular to the substrate.