CLAIMS

1. A floating body field-effect transistor comprising:

a pair of source/drain regions having a floating body channel region received therebetween, the source/drain regions and the floating body channel region being received over an insulator;

a gate electrode proximate the floating body channel region;

a gate dielectric received between the gate electrode and the floating body channel region; and

each of the pair of source/drain regions comprising an elevated source/drain portion and a non-elevated source/drain portion, the elevated source/drain portion comprising $Si_xGe_{(1-x)}$, the non-elevated source/drain portion comprising a highest dopant concentration portion comprising silicon, Ge quantity in the elevated source/drain portion being greater than any quantity of Ge within the highest dopant concentration portion of the non-elevated silicon-comprising source/drain portion.

2. The floating body field-effect transistor of claim 1 wherein the highest dopant concentration portion of the non-elevated source/drain portion is void of Ge.

3. The floating body field-effect transistor of claim 1 wherein the highest dopant concentration portion of the non-elevated source/drain portion comprises Ge.

4. The floating body field-effect transistor of claim 3 wherein Ge quantity in the highest dopant concentration portion of the non-elevated source/drain portion is less than about 10 atomic per cent.

5. The floating body field-effect transistor of claim 4 wherein Ge quantity in the highest dopant concentration portion of the non-elevated source/drain portion is less than about 1 atomic per cent.

6. A floating body field-effect transistor comprising:

a pair of source/drain regions having a floating body channel region received therebetween, the source/drain regions and the floating body channel region being received over an insulator;

a gate electrode proximate the floating body channel region;

a gate dielectric received between the gate electrode and the floating body channel region; and

the floating body channel region comprising a semiconductor $Si_xGe_{(1-x)}$-comprising region, a semiconductor silicon-comprising region, and an insulating material region received between the semiconductor $Si_xGe_{(1-x)}$-comprising region and the semiconductor silicon-comprising region, the semiconductor $Si_xGe_{(1-x)}$-comprising region having greater quantity of Ge than any quantity of Ge within the semiconductor silicon-comprising region.

7. The floating body field-effect transistor of claim 6 wherein the semiconductor silicon-comprising region is void of Ge.

9. The floating body field-effect transistor of claim 6 wherein the semiconductor silicon-comprising region comprises Ge.

9. The floating body field-effect transistor of claim 8 wherein Ge quantity in the semiconductor silicon-comprising region is less than about 10 atomic per cent.

10. The floating body field-effect transistor of claim 9 wherein Ge quantity in the semiconductor silicon-comprising region is less than about 1 atomic per cent.

11. A floating body field-effect transistor comprising:

a pair of source/drain regions having a floating body channel region received therebetween, the source/drain regions and the floating body channel region being received over an insulator;

a gate electrode proximate the floating body channel region;

a gate dielectric received between the gate electrode and the floating body channel region;

the floating body channel region comprising a semiconductor first silicon-comprising region, a semiconductor second silicon-comprising region, and a semiconductor $Si_xGe_{(1-x)}$-comprising region; the semiconductor $Si_xGe_{(1-x)}$-comprising region being received between the semiconductor first and second silicon-comprising regions; the semiconductor $Si_xGe_{(1-x)}$-comprising region having greater quantity of Ge than any quantity of Ge within each of the semiconductor first and second silicon-comprising regions; and

the semiconductor first silicon-comprising region being received directly physically contacting against the insulator and comprising laterally outermost sidewalls, an insulative material being received between at least some of the laterally outermost sidewalls and the source/drain regions.

12. The floating body field-effect transistor of claim 11 wherein the semiconductor first and second silicon-comprising regions are void of Ge.

13. The floating body field-effect transistor of claim 11 wherein the semiconductor first and second silicon-comprising regions consist essentially of p-doped silicon.

14. The floating body field-effect transistor of claim 11 wherein the semiconductor second silicon-comprising region and the semiconductor $Si_xGe_{(1-x)}$-comprising region comprise laterally outermost sidewalls which directly physically contact against the source/drain regions.

15. A method of forming a floating body field-effect transistor, comprising:

forming a semiconductor $Si_xGe_{(1-x)}$-comprising layer over an insulator;

forming a semiconductor silicon-comprising layer over and in direct physical contact with the semiconductor $Si_xGe_{(1-x)}$-comprising layer, the semiconductor $Si_xGe_{(1-x)}$-comprising layer having greater quantity of Ge than any quantity of Ge within the semiconductor silicon-comprising layer;

forming a gate dielectric and a gate electrode over the semiconductor silicon-comprising layer; and

using the gate dielectric and the gate electrode at least in part as a mask, ion implanting n-type conductivity enhancing impurity into unmasked portions of the semiconductor silicon-comprising layer and the semiconductor $Si_xGe_{(1-x)}$-comprising layer to form a pair of highest dopant concentration n-type source/drain regions comprising the semiconductor silicon-comprising layer and the semiconductor $Si_xGe_{(1-x)}$-comprising layer, and forming a floating body channel region between the pair, the floating body channel region comprising the semiconductor silicon-comprising layer and the semiconductor $Si_xGe_{(1-x)}$-comprising layer.

16. The floating body field-effect transistor of claim 5 wherein Ge quantity in the non-elevated source/drain portion is less than about 0.1 atomic per cent.

17. The floating body field-effect transistor of claim 10 wherein Ge quantity in the semiconductor silicon-comprising region is less than about 0.1 atomic per cent.

The invention claimed is:

1. A floating body field-effect transistor comprising:

a pair of source/drain regions having a floating body channel region therebetween, the source/drain regions and the floating body channel region being over an insulator; a gate electrode proximate the floating body channel region; a gate dielectric between the gate electrode and the floating body channel region; and

each of the pair of source/drain regions comprising an elevated source/drain portion and a non-elevated source/drain portion, the elevated source/drain portion comprising $Si_xGe_{(1-x)}$, the non-elevated source/drain portion comprising a highest dopant concentration portion comprising silicon, Ge quantity in the elevated source/drain portion being greater than any quantity of Ge within the highest dopant concentration portion of the non-elevated silicon-comprising source/drain portion.

2. The floating body field-effect transistor of claim 1 wherein the highest dopant concentration portion of the non-elevated source/drain portion is void of Ge.

3. The floating body field-effect transistor of claim 1 wherein the highest dopant concentration portion of the non-elevated source/drain portion comprises Ge.

4. The floating body field-effect transistor of claim 3 wherein Ge quantity in the highest dopant concentration portion of the non-elevated source/drain portion is less than about 10 atomic per cent.

5. The floating body field-effect transistor of claim 4 wherein Ge quantity in the highest dopant concentration portion of the non-elevated source/drain portion is less than about 1 atomic per cent.

6. The floating body field-effect transistor of claim 5 wherein Ge quantity in the non-elevated source/drain portion is less than about 0.1 atomic per cent.

7. A floating body field-effect transistor comprising:

a pair of source/drain regions having a floating body channel region therebetween, the source/drain regions and the floating body channel region being over an insulator; a gate electrode proximate the floating body channel region;

a gate dielectric between the gate electrode and the floating body channel region; and

the floating body channel region comprising a semiconductor $Si_xGe_{(1-x)}$-comprising region, a semiconductor silicon-comprising region, and an insulating material region, the insulative material region being between and separating the semiconductor $Si_xGe_{(1-x)}$-comprising region and the semiconductor silicon-comprising region, the insulative material region extending from one of the pair of source/drain regions to the other of the pair of source/drain regions, the semiconductor $Si_xGe_{(1-x)}$-comprising region having greater quantity of Ge than any quantity of Ge within the semiconductor silicon-comprising region.

8. The floating body field-effect transistor of claim 7 wherein the semiconductor silicon-comprising region is void of Ge.

9. A floating body field-effect transistor comprising:

a pair of source/drain regions having a floating body channel region therebetween, the source/drain regions and the floating body channel region being over an insulator; a gate electrode proximate the floating body channel region;

a gate dielectric between the gate electrode and the floating body channel region; and the floating body channel region comprising a semiconductor $Si_xGe_{(1-x)}$-comprising region, a semiconductor silicon-comprising region, and an insulating material region between the semiconductor $Si_xGe_{(1-x)}$-comprising region and the semiconductor silicon-comprising region, the semiconductor $Si_xGe_{(1-x)}$-comprising region having greater quantity of Ge than any quantity of Ge within the semiconductor silicon-comprising region, the semiconductor silicon-comprising region comprising Ge.

10. The floating body field-effect transistor of claim 9 wherein Ge quantity in the semiconductor silicon-comprising region is less than about 10 atomic per cent.

11. The floating body field-effect transistor of claim 10 wherein Ge quantity in the semiconductor silicon-comprising region is less than about 1 atomic per cent.

12. The floating body field-effect transistor of claim 11 wherein Ge quantity in the semiconductor silicon-comprising region is less than about 0.1 atomic per cent.

13. The floating body field-effect transistor of claim 9 wherein the insulative material region separates the semiconductor $Si_xGe_{(1-x)}$-comprising region and the semiconductor silicon-comprising region.

14. A floating body field-effect transistor comprising:

a pair of source/drain regions having a floating body channel region therebetween, the source/drain regions and the floating body channel region being over an insulator; a gate electrode proximate the floating body channel region;

a gate dielectric between the gate electrode and the floating body channel region;

the floating body channel region comprising a semiconductor first silicon-comprising region, a semiconductor second silicon-comprising region, and a semiconductor $Si_xGe_{(1-x)}$-comprising region; the semiconductor $Si_xGe_{(1-x)}$-comprising region being between the semiconductor first and second silicon-comprising regions; the semiconductor $Si_xGe_{(1-x)}$-comprising region having greater quantity of Ge than any quantity of Ge within each of the semiconductor first and second silicon-comprising regions; and the semiconductor first silicon-comprising region being directly physically contacting against the insulator and comprising laterally outermost sidewalls, the source/drain regions being laterally over the laterally outermost sidewalls of the semiconductor first silicon-comprising region, an insulative material being between at least some of the laterally outermost sidewalls and the source/drain regions.

15. The floating body field-effect transistor of claim 14 wherein the semiconductor first and second silicon-comprising regions are void of Ge.

16. The floating body field-effect transistor of claim 14 wherein the semiconductor first and second silicon-comprising regions consist essentially of p-doped silicon.

17. The floating body field-effect transistor of claim 14 wherein the semiconductor second silicon-comprising region and the semiconductor $Si_xGe_{(1-x)}$-comprising region comprise laterally outermost sidewalls which directly physically contact against the source/drain regions.