~~WHAT IS CLAIMED IS~~CLAIMS:

1. A method of preparing a single crystal silicon ingot by the Czochralski method, the method comprising:

contacting a silicon seed crystal with a silicon melt, wherein the silicon melt is contained within a crucible and comprises molten silicon and an n-type dopant;

withdrawing the silicon seed crystal from the silicon melt to form a neck portion of the single crystal silicon ingot, the neck portion having a resistivity between 5 milliohm-cm and about 12 milliohm-cm, wherein the silicon seed crystal is withdrawn at a pull rate between about 3 mm/minute and about 5 mm/minute, further wherein the neck portion of the single crystal silicon ingot comprises vacancies as a dominant interstitial point defect, and further wherein a concentration of the n-type dopant in the neck portion is between about $3.5x10^{18}$ atoms/cm^3 and about $1.3x10^{19}$ atoms/cm^3;

growing an outwardly flaring seed-cone adjacent the neck portion of the single crystal silicon ingot, the outwardly flaring seed-cone having a resistivity between 5 milliohm-cm and about 12 milliohm-cm, wherein the outwardly flaring seed-cone of the single crystal silicon ingot comprises vacancies as a dominant interstitial point defect and further wherein a concentration of the n-type dopant in the outwardly flaring seed-cone is between about $3.5x10^{18}$ atoms/cm^3 and about $1.3x10^{19}$ atoms/cm^3;

adding an n-type dopant to the melt in a concentration sufficient to lower the resistivity of the main body of the single crystal silicon ingot to a resistivity of less than 4 milliohm-cm; and,

growing a main body of the single crystal silicon ingot adjacent the outwardly flaring seed-cone, the main body of the single crystal silicon ingot having a resistivity of less than 4 milliohm-cm.

2. The method of claim 1, further comprising:

completing growth of the single crystal silicon ingot;

adding silicon and an n-type dopant to the crucible to form a replenished silicon melt;

contacting a second silicon seed crystal with the replenished silicon melt comprising molten silicon and added n-type dopant; and

withdrawing the second silicon seed crystal from the silicon melt to form a second neck portion of a second single crystal silicon ingot, the second neck portion having a resistivity between 5 milliohm-cm and about 12 milliohm-cm.

~~3. The method of claim 1, wherein the silicon seed crystal is withdrawn at a pull rate between about 1.5 mm/minute and about 6 mm/minute.~~

~~4. The method of claim 1, wherein the silicon seed crystal is withdrawn at a pull rate between about 3 mm/minute and about 5 mm/minute.~~

~~5~~3. The method of ~~any one of~~ claim~~s~~ 1 ~~through 3~~, wherein the silicon seed crystal is rotated at a rate of between about 8 rpm and about 15 rpm.

~~6~~4. The method of ~~any one of~~ claim~~s~~ 1 ~~through 3~~, wherein the crucible is rotated at a rate of between about 5 rpm and about 10 rpm.

~~7~~5. The method of ~~any one of~~ claim~~s~~ 1 ~~through 6~~, wherein the neck portion has a diameter between about 2.5 mm and about 6.5 mm.

~~8~~6. The method of ~~any one of~~ claim~~s~~ 1 ~~through 6~~, wherein the neck portion has a diameter between about 3 mm and about 6 mm.

~~9~~7. The method of ~~any one of~~ claim~~s~~ 1 ~~through 8~~, wherein the single crystal silicon ingot is an n-type ingot.

~~10~~8. The method of claim ~~9~~7, wherein a concentration of the n-type dopant in the neck portion and the outwardly flaring seed-cone exceeds a concentration of the p-type dopant in the neck portion and the outwardly flaring seed-cone.

~~11~~9. The method of claim ~~9~~7, wherein the concentration of the n-type dopant in the neck portion is between about ~~3.5x10^{18} atoms/cm^3 and about 1.3x10^{19} atoms/cm^3, such as between about~~ 4x10^{18} atoms/cm^3 and 1x10^{19} atoms/cm^3.

~~12~~10. The method of claim ~~9~~7, wherein the concentration of the n-type dopant in the outwardly flaring seed-cone is between about ~~3.5x10^{18} atoms/cm^3 and about 1.3x10^{19} atoms/cm^3, such as between about~~ 4x10^{18} atoms/cm^3 and 1x10^{19} atoms/cm^3.

~~13~~11. The method of claim ~~9~~7, wherein the neck portion has resistivity between 5 milliohm-cm and about 8 milliohm-cm.

~~14~~12. The method of claim ~~9~~7, wherein the outwardly flaring seed-cone has resistivity between 5 milliohm-cm and about 8 milliohm-cm.

~~15~~13. The method of ~~any one of~~ claim~~s~~ 1~~ through 14~~, wherein the main body of the single crystal silicon ingot has a resistivity of less than about 2 milliohm-cm.

~~16~~14. The method of ~~any one of~~ claim~~s~~ 1~~ through 14~~, wherein the main body of the single crystal silicon ingot has a resistivity of less than 1.7 milliohm-cm.

~~17~~15. The method of ~~any one of~~ claim~~s~~ 1~~ through 14~~, wherein the main body of the single crystal silicon ingot has a resistivity of less than 1.6 milliohm-cm.

~~18~~16. The method of ~~any one of~~ claim~~s~~ 1~~ through 17~~, wherein the n-type dopant is selected from the group consisting of arsenic, phosphorus, antimony, and any combination thereof.

~~19~~17. The method of ~~any one of~~ claim~~s~~ 1~~ through 17~~, wherein the n-type dopant is arsenic.

~~20~~18. The method of ~~any one of~~ claim~~s~~ 1~~ through 19~~, wherein the concentration of n-type dopant added to the silicon melt is between about 200 grams of n-type dopant/60 kilograms of silicon and about 400 grams of n-type dopant/60 kilograms of silicon.

~~21~~19. The method of ~~any one of~~ claim~~s~~ 1~~ through 19~~, wherein the concentration of n-type dopant added to the silicon melt is about 300 grams of n-type dopant/60 kilograms of silicon.

~~22. The method of any one of claims 1 through 21, wherein the neck portion of the single crystal silicon ingot comprises vacancies as a dominant interstitial point defect.~~

~~23. The method of any one of claims 1 through 22, wherein the outwardly flaring seed-cone of the single crystal silicon ingot comprises vacancies as a dominant interstitial point defect.~~

~~24~~20. The method of ~~any one of~~ claim~~s~~ 1 ~~through 23~~, wherein a slice of the main body of the single crystal silicon ingot comprises less than about 400 dislocations/cm^2.

~~25~~21. The method of ~~any one of~~ claim~~s~~ 1 ~~through 23~~, wherein a slice of the main body of the single crystal silicon ingot comprises less than about 100 dislocations/cm^2.

~~26~~22. The method of ~~any one of~~ claim~~s~~ 1 ~~through 23~~, wherein a slice of the main body of the single crystal silicon ingot comprises less than about 10 dislocations/cm^2.

~~27~~23. The method of ~~any one of~~ claim~~s~~ 1 ~~through 23~~, wherein a slice of the main body of the single crystal silicon ingot comprises less than 1 dislocation/cm^2.

~~28~~24. The method of ~~any one of~~ claim~~s~~ 1 ~~through 23~~, wherein a slice of the main body of the single crystal silicon ingot is a zero dislocation wafer.

~~29~~25. A single crystal silicon ingot comprising:

a neck portion of the single crystal silicon ingot, the neck portion having a resistivity between 5 milliohm-cm and about 12 milliohm-cm, wherein the neck portion of the single crystal silicon ingot comprises vacancies as a dominant interstitial point defect and further wherein a concentration of the n-type dopant in the neck portion is between about 3.5x10^{18} atoms/cm^3 and about 1.3x10^{19} atoms/cm^3;

an outwardly flaring seed-cone adjacent the neck portion of the single crystal silicon ingot, the outwardly flaring seed-cone having a resistivity between 5 milliohm-

cm and about 12 milliohm-cm, wherein the outwardly flaring seed-cone of the single crystal silicon ingot comprises vacancies as a dominant interstitial point defect and further wherein a concentration of the n-type dopant in the outwardly flaring seed-cone is between about $3.5x10^{18}$ atoms/cm^3 and about $1.3x10^{19}$ atoms/cm^3; and,

a main body of the single crystal silicon ingot adjacent the outwardly flaring seed-cone, the main body of the single crystal silicon ingot having a resistivity of less than 4 milliohm-cm.

~~30~~26. The single crystal silicon ingot of claim ~~29~~25, wherein a slice of the main body of the single crystal silicon ingot comprises less than about 400 dislocations/cm^2.

~~31~~27. The single crystal silicon ingot of claim ~~29~~25, wherein a slice of the main body of the single crystal silicon ingot comprises less than about 100 dislocations/cm^2.

~~32~~28. The single crystal silicon ingot of claim ~~29~~25, wherein a slice of the main body of the single crystal silicon ingot comprises less than about 10 dislocations/cm^2.

~~33. The single crystal silicon ingot of claim 29, wherein a slice of the main body of the single crystal silicon ingot comprises less than 1 dislocation/cm^2.~~

~~34~~29. The single crystal silicon ingot of claim ~~29~~25, wherein a slice of the main body of the single crystal silicon ingot is a zero dislocation wafer.

30. The single crystal silicon ingot of claim 25, wherein a slice of the main body of the single crystal silicon ingot comprises less than 1 dislocation/cm^2.