CLAIMS

What is claimed is:

1. A photovoltaic laminate comprising:

a first solar cell;

a first metal foil with a first plurality of contact fingers, a second plurality of contact fingers, and an interconnect, the interconnect of the first metal foil being between the first plurality of contact fingers and the second plurality of contact fingers of the first metal foil, wherein the first plurality of contact fingers, the second plurality of contact fingers, and the interconnect of the first metal foil are of a single sheet of metal and within a same plane;

a second metal foil comprising a first plurality of contact fingers, a second plurality of contact fingers, and interconnect, the interconnect of the second metal foil being between the first plurality of contact fingers and the second plurality of contact fingers of the secondmetal foil, the first plurality of contact fingers of the second metal foil being interdigitated with the first plurality of contact fingers of the first metal foil on a backside of the first solar cell, wherein the first plurality of contact fingers, the second plurality of contact fingers, and the interconnect of the second metal foil are all of a single sheet of a metal and within a same plane;

a plurality of metal bonds couple the first plurality of contact fingers of the first metal foil directly to the first solar cell.

2. The photovoltaic laminate of claim 1, further comprising:

a second solar cell; and

a third metal foil comprising a first plurality of contact fingers, a second plurality of contact fingers, and an interconnect, the interconnect of the third metal foil being between the first plurality of contact fingers and the second plurality of contact fingers of the third metal foil, wherein the first plurality of contact fingers, the second plurality of contact fingers, and the interconnect of the third metal foil are all of a single sheet of metal and within a same plane,

wherein the second plurality of contact fingers of the second metal foil is interdigitated with the first plurality of contact fingers of the third metal foil on a backside of the second solar cell.

3. The photovoltaic laminate of claim 1, wherein the first plurality of contact fingers of the first metal foil are connected to a P-type diffusion region of the first solar cell and the first plurality of contact fingers of the second metal foil are connected to an N-type diffusion region of the first solar cell.

4. The photovoltaic laminate of claim 1, further comprising:

a first encapsulant on a front side of the first solar cell;

a transparent layer on the first encapsulant on the front side of the first solar cell.

5. The photovoltaic laminate of claim 4, further comprising:

a back layer on the first and second metal foils on the backside of the first solar cell.

6. The photovoltaic laminate of claim 5, further comprising:

a second encapsulant between the back layer and the first and second metal foils on the backside of the first solar cell.

7. A photovoltaic laminate comprising:

a first solar cell;

a second solar cell;

a first contact finger having a first end on a backside of the first solar cell;

a second contact finger having a first end on the backside of the first solar cell; and

a third contact finger having a first end on the backside of the first solar cell,

wherein the first contact finger, the second contact finger, and the third contact finger are alternately arranged on the backside of the first solar cell and each is a single strip of metal foil that is within same plane and extends to the second solar cell,

wherein a plurality of metal bonds couple the first contact finger directly to the first solar cell,

wherein a second end of the first contact finger, a second end of the second contact finger, and a second end of the third contact finger are alternately arranged on a backside of the second solar cell.

8. The photovoltaic laminate of claim 7, wherein the first end of the first contact finger is connected to a P-type diffusion region of the first solar cell and the first end of the second contact finger is connected to an N-type diffusion region of the first solar cell.

9. The photovoltaic laminate of claim 7, further comprising:

a first encapsulant on a front side of the first solar cell; and

a transparent layer on the first encapsulant on the front side of the first solar cell.

10. The photovoltaic laminate of claim 9, further comprising:

a back layer on the first, second, and third contact fingers on the backside of the first solar cell.

11. The photovoltaic laminate of claim 10, further comprising:

a second encapsulant between the back layer and the first, second, and third contact fingers on the backside of the first solar cell.

12. A photovoltaic laminate comprising:

a first solar cell;

a first metal foil comprising a first bus bar and a first plurality of contact fingers, the first bus bar and the first plurality of contact fingers being directly coupled to a backside of the first solar cell by a first plurality of metal bonds, wherein the first bus bar and the first plurality of contact fingers of the first metal foil are all of a single sheet of metal within a same plane; and

a second metal foil comprising a second bus bar and a second plurality of contact fingers, the second bus bar and the second plurality of contact fingers being directly coupled to the backside of the first solar cell by a second plurality of metal bonds, wherein the second bus bar and the second plurality of contact fingers of the second metal foil are all of a single sheet of metal and within same plane.

13. The photovoltaic laminate of claim 12, further comprising:

a first encapsulant on a front side of the first solar cell; and

a transparent layer on the first encapsulant on the front side of the first solar cell.

14. The photovoltaic laminate of claim 13, further comprising:

a back layer on the first and second metal foils on the backside of the first solar cell.

15. The photovoltaic laminate of claim 14, further comprising:

a second encapsulant between the back layer and the first and second metal foils on the backside of the first solar cell.

16. The photovoltaic laminate of claim 12, wherein the first plurality of contact fingers are interdigitated with the second plurality of contact fingers.

17. The photovoltaic laminate of claim 12, further comprising:

a second solar cell that is connected to the first solar cell.

18. The photovoltaic laminate of any one of claims 1, 7, and 12, wherein the metal bonds comprising a metal bond selected from the group consisting of a weld, a laser weld, a solder bond, a thermal energy bond and an ultrasonic bond that are formed directly from the metal foils.

19. A photovoltaic laminate comprising:

a first solar cell; and

a patterned metal foil including a first plurality of contact fingers that are directly bonded to a back side of the first solar cell via a first plurality of metal bonds and a first interconnect that electrically connects to the first solar cell, wherein the first plurality of contact fingers extend from and are continuously connected with the first interconnect, wherein the first plurality of contact fingers, and the interconnect of the patterned metal foil are all of a single sheet of metal and within a same plane, and

a second plurality of contact fingers that are directly bonded to the back side of the first solar cell via a plurality of metal bonds and a second interconnect that electrically connects to the first solar cell, the second plurality of contact fingers extend from and are continuously connected with the second interconnect, wherein the first plurality of contact fingers interdigitate with the second plurality of contact fingers on the backside of the first solar cell wherein the second plurality of contact fingers and the second interconnect of the patterned metal foil are all of a single sheet of metal and within a same plane.

20. The photovoltaic laminate of claim 19, wherein:

the first interconnect of the patterned metal foil extends from one side of the first solar cell, and the second interconnect of the patterned metal foil extends from an opposite side of the first solar cell.

21. The photovoltaic laminate of claim 19, wherein the patterned metal foil further includes a first bus bar located between the first plurality of contact fingers and the first interconnect,

and second bus bar located between second plurality of contact fingers and the second interconnect.

22. The photovoltaic laminate of claim 19, the metal bonds comprising a metal bond selected from the group consisting of a weld, a laser weld, a solder bond, a thermal energy bond and an ultrasonic bond that are formed directly from the metal foils.