

Claims

1. A solar cell module, characterized in that, comprising:

at least one solar cell piece that is arranged in a longitudinal or transverse direction,

wherein

- the at least one solar cell piece comprises at least two independent areas separated by an isolation zone for electrically separating the at least two independent areas,
- the at least two independent areas are connected in one string, and
- one of the at least two independent areas comprises a front surface and a back surface, wherein
 - ✓ the front surface is provided with a power generation area and at least one front main gate line disposed beside an edge of the power generation area,
 - ✓ a plurality of thin gate lines are disposed on the power generation area, and the thin gate lines are connected to the at least one front main gate line,
 - ✓ the back surface is provided with at least one back main gate line and an aluminum back field, wherein the at least one front main gate line and the at least one back main gate line are located on two opposite edges of one the at least two independent areas, and
 - ✓ the front main gate line and the back main gate line of one of the at least two independent areas are conductively connected to the back main gate line of one adjacent independent area and the front main gate line of another adjacent solar cell piece respectively.

2. The solar cell module of claim 1, characterized in that, comprising:

one of at least two independent areas comprising a front surface and a back surface, wherein

- the front surface is provided with a power generation area and at least one front main gate line disposed beside an edge of the power generation area,

- a plurality of thin gate lines are disposed on the power generation area, and the thin gate lines are connected to the at least one front main gate line,
 - 5 • the back surface is provided with at least one back main gate line and an aluminum back field,
 - the at least one front main gate line and the at least one back main gate line are located on two opposite edges of the at least two independent areas, and
 - 10 • the back main gate line of one of the at least two independent areas is conductively connected to the front main gate line of another independent area.
3. The solar cell module of claim 2, characterized in that, the front main gate line is connected to one end of at least one of the thin gate lines.
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4. The solar cell module of claim 1, characterized in that,
- at least two independent areas are electrically connected to form a solar cell piece,
 - the solar cell module comprises at least one cell piece, and
 - 20 • the at least one cell piece comprises 2-80 of the independent areas.
5. The solar cell module of claim 4, characterized in that, the solar cell module comprises at least two cell pieces and a plurality of interconnect busbars disposed between the at least two cell pieces, wherein
- 25 the solar cell pieces can be wholly serially connected, wholly connected in parallel, wholly serially connected after a first amount of solar cell pieces being connected in parallel or wholly connected in parallel after a second amount of the solar cell pieces being serially connected.
- 30 6. The solar cell module of claim 5, characterized in that, at least one lead wire is disposed between one of the interconnect busbar and one of the cell pieces, wherein

- a first portion of the lead wire is electrically connected to the front main gate line or the back main gate line of the independent area at the outermost location of the cell piece, and
- a second portion of the lead wire extends outwardly in a direction away from the cell piece and is electrically connected to the interconnect busbar.

7. The solar cell module of claim 6, characterized in that, the interconnect busbar has a connection portion electrically connected to the front main gate line or the back main gate line of the independent area at the outermost location of the cell piece wherein the width between the connection portion of the interconnect busbar and the front main gate line or the back main gate line of the independent area is 1-8mm.

8. The solar cell module of claim 7, characterized in that,

- a portion of the interconnect busbar having the function of the lead wire is folded onto the back surface of the solar cell piece, and
- an insulating layer is disposed between the interconnect busbar and the back surface of the solar cell piece, wherein the interconnect busbar and the back surface of the solar cell piece is isolated by the insulating layer.

9. The solar cell module of claim 7, characterized in that, the interconnect busbar is provided with the connection portion and an extension portion, wherein

- the connection portion and the front main gate line or the back main gate line connected thereof are disposed in a same direction, and
- the extension portion is perpendicular to or forms an obtuse angle or an acute angle with the connection portion of the interconnect busbar.

10. The solar cell module of claim 9, characterized in that, the solar cell piece is provided with a main lead wire, wherein

- the lead wire has at least two connection portions connected to the front main gate line or the back main gate line, and
- the extension portion of the lead wire is further connected to the main lead wire.

11. The solar cell module of claim 10, characterized in that,

- the front main gate lines and the back main gate lines disposed on a same side at the outermost location of two adjacent cell pieces have opposite polarities, and
- the front main gate lines and the back main gate lines are arranged at intervals, wherein
 - ✓ the front main gate lines and the back main gate lines located on one side of cell pieces are connected to a first main lead wire,
 - ✓ the front main gate lines located on the opposite side are connected to a second main lead wire (front main gate line main lead wire),
 - ✓ the back main gate lines located on the opposite side are connected to a third main lead wire (back main gate line main lead wire), and
 - ✓ the second main lead wire (the front main gate line main lead wire) and the third main lead wire (the back main gate line main lead wire) serve as master output lead wires of the solar cell module.

12. The solar cell module of claim 11, characterized in that,

- the lead wire connected to the front main gate line or the back main gate line of the cell piece is bent and folded onto the back surface of the cell piece,
- the second main lead wire (the front main gate line main lead wire) and the third main lead wire (the back main gate line main lead wire) are disposed on the back surface of the cell piece, and
- an insulating component is disposed between the second main lead wire (the front main gate line main lead wire) and the third main lead wire (the back main gate line main lead wire) on the back surface of the cell piece.

13. A method for making the independent areas of claims 1-12, comprising following steps of:

(1) Step 1: providing a silicon chip layer;

(2) Step 2. printing:

- 5 printing a front screen-printed pattern and a back screen-printed pattern on the front surface and the back surface of the silicon chip layer, wherein
- the front screen-printed pattern comprises thin gate lines and front main gate lines that are perpendicular to the thin gate lines, wherein
 - ✓ the front main gate lines are uniformly arranged at intervals along
 - 10 the length direction of the thin gate lines, and
 - ✓ front edge main gate lines are provided at a border of one side of the front screen-printed pattern;
 - the back screen-printed pattern comprises back main gate lines and an aluminum back surface field, wherein
 - 15 ✓ the back main gate lines and the front main gate lines are uniformly disposed at intervals in a same direction,
 - ✓ back edge main gate lines are provided at a border of one side of the back screen-printed pattern, and
 - ✓ the front edge main gate lines and the back edge main gate lines
 - 20 are disposed on two opposite sides of the silicon chip layer;

(3) Step 3. separating:

- electrically separating the silicon chip layer into at least two independent areas by providing an isolation zone between thereof on the front surface;

(4) Step 4. electrically connecting:

- providing electrically conducting means to electrically connect the front main gate line in one of the at least two of independent areas to the back main gate line of one adjacent independent area.

14. The at least two independent areas of claim 13, characterized in that, the electrically conducting means used in step 4 of electrically connecting is an electrically conductive wire.