

a back surface of a silicon substrate without forming an electrode on an acceptance surface of the silicon substrate. The back contact type solar battery having the acceptance surface having no electrode formed thereon can take 100% of incident sunlight into the solar battery without having a shadow loss caused by an electrode, which can fundamentally achieve high efficiency.

[0005]

When the sunlight is incident on the acceptance surface of the back contact type solar battery, careers generated near the acceptance surface of the silicon substrate reach p-n junction formed on the back surface of the back contact type solar battery. The careers are collected by a p-type finger electrode and an n-type finger electrode, and taken out to the outside.

[0006]

Fig. 1 shows an electrode structure of a general solar battery. An electrode includes a finger part 102 and a bus bar part 103. The finger part 102 is a collecting electrode formed for the purpose of efficiently collecting a photoelectric current generated from the solar battery without causing a resistance loss. The bus bar part 103 collects the current through the finger part 102, and functions as a ground of a tab line. Fig. 2 shows a current flow when a tab line is applied to an acceptance surface of the general solar battery cell. As shown in Fig. 2, electrons generated within a silicon substrate

CLAIMS

1. A solar battery comprising:
 - a semiconductor substrate;
 - a first conductivity type region formed on a back surface side located on the opposite side of an acceptance surface side of the semiconductor substrate;
 - a second conductivity type region formed on the back surface side of the semiconductor substrate;
 - a first conductivity type collecting electrode substantially linearly formed on the first conductivity type region; and
 - a second conductivity type collecting electrode substantially linearly formed on the second conductivity type region, wherein
 - the first and second conductivity type regions are alternately arranged,
 - each of the first and second conductivity type collecting electrodes has discontinuous places, and
 - the discontinuous places of each conductivity type are substantially aligned on a straight line in an arrangement direction in which the first and second conductivity type regions are alternately arranged.
2. The solar battery according to claim 1, wherein a portion adjacent to each of the discontinuous places in each of the first

and second conductivity type collecting electrodes is formed as a small bus bar thicker than the other portion in each of the first and second conductivity type collecting electrodes.

3. The solar battery according to claim 2, wherein

the small bus bar in each of the first and second conductivity type collecting electrodes has a line width of 200 to 2000 μm , and

the portion other than the small bus bar in each of the first and second conductivity type collecting electrodes has a line width of 50 to 500 μm .

4. The solar battery according to claim 2 or 3, wherein the small bus bar is provided at a position which is not adjacent to a longitudinal end of each of the first and second conductivity type collecting electrodes in the semiconductor substrate.

5. The solar battery according to any one of claims 2 to 4, wherein the discontinuous places of one of the first and second conductivity type collecting electrodes are adjacent to the small bus bars of the other of the first and second conductivity type collecting electrodes in the arrangement direction.

6. The solar battery according to any one of claims 1 to 5, wherein the number of the discontinuous places is 1 to 4 in a

longitudinal direction of each of the first and second
conductivity type collecting electrodes.

a back surface of a silicon substrate without forming an electrode on an acceptance surface of the silicon substrate. The back contact type solar battery having the acceptance surface having no electrode formed thereon can take 100% of incident sunlight into the solar battery without having a shadow loss caused by an electrode, which can fundamentally achieve high efficiency.

[0005]

When the sunlight is incident on the acceptance surface of the back contact type solar battery, carriers generated near the acceptance surface of the silicon substrate reach p-n junction formed on the back surface of the back contact type solar battery. The **carriers** are collected by a p-type finger electrode and an n-type finger electrode, and taken out to the outside.

[0006]

Fig. 1 shows an electrode structure of a general solar battery. An electrode includes a finger part 102 and a bus bar part 103. The finger part 102 is a collecting electrode formed for the purpose of efficiently collecting a photoelectric current generated from the solar battery without causing a resistance loss. The bus bar part 103 collects the current through the finger part 102, and functions as a ground of a tab line. Fig. 2 shows a current flow when a tab line is applied to an acceptance surface of the general solar battery cell. As shown in Fig. 2, electrons generated within a silicon substrate

CLAIMS

1. A solar battery comprising:
 - a semiconductor substrate;
 - a first conductivity type region formed on a back surface side located on the opposite side of an acceptance surface side of the semiconductor substrate;
 - a second conductivity type region formed on the back surface side of the semiconductor substrate;
 - a first conductivity type collecting electrode substantially linearly formed on the first conductivity type region; and
 - a second conductivity type collecting electrode substantially linearly formed on the second conductivity type region, wherein
 - the first and second conductivity type regions are alternately arranged,
 - each of the first and second conductivity type region is continuously formed substantially linearly,
 - each of the first and second conductivity type collecting electrodes has discontinuous places, and
 - the discontinuous places of each conductivity type collecting electrode are substantially aligned on a straight line in an arrangement direction in which the first and second conductivity type regions are alternately arranged.
2. The solar battery according to claim 1, wherein a portion adjacent to each of the discontinuous places in each of the first and second conductivity type collecting electrodes is formed as a small bus bar wider than the other portion on each of the first and second conductivity type collecting electrodes.
3. The solar battery according to claim 2, wherein
 - the small bus bar in each of the first and second conductivity type collecting electrodes has a line width of 200 to 2000 μ m, and
 - the portion other than the small bus bar in each of the first and second conductivity type collecting electrodes has a line width of 50 to 500 μ m.

4. The solar battery according to claim 2 or 3, wherein the small bus bar is provided at a position which is not adjacent to an end of the semiconductor substrate in a longitudinal direction of the first and second conductivity type collecting electrodes.
5. The solar battery according to any one of claims 2 to 4, wherein the discontinuous places of one of the first and second conductivity type collecting electrodes are adjacent to the small bus bars of the other of the first and second conductivity type collecting electrodes in the arrangement direction.
6. The solar battery according to any one of claims 1 to 5, wherein the number of the discontinuous place is 1 to 4 in a longitudinal direction of each of the first and second conductivity type collecting electrodes.