CLAIMS:

1. Method of bonding an array of semiconductor components onto one or more substrates, comprising the steps of:

providing a first plurality of semiconductor components and a second plurality of semiconductor components on a carrier;

locating the first plurality of semiconductor components for pick-up by a transfer device;

picking up each semiconductor component comprised in the first plurality of semiconductor components with the transfer device and bonding it onto a respective bonding position on the one or more substrates;

after the first plurality of semiconductor components have been picked up and bonded, rotating the carrier and locating the second plurality of semiconductor components for pick-up by the transfer device; and thereafter

picking up each semiconductor component comprised in the second plurality of semiconductor components with the transfer device and bonding it onto a respective bonding position on the one or more substrates.

2. Method as claimed in claim 1, wherein the semiconductor components comprise semiconductor dice of a circular semiconductor wafer, and the semiconductor dice are arranged in an array.

3. Method as claimed in claim 2, wherein the first plurality of semiconductor dice extends for a first half of the wafer, and the second plurality of semiconductor dice extends for a second half for the wafer.

4. Method as claimed in claim 3, wherein all the semiconductor dice comprised in the first half of the wafer are picked up before the carrier is rotated.

5. Method as claimed in claim 1, wherein the semiconductor components are picked from a fixed pick-up point, and picking up each semiconductor component

further comprises the step of moving said semiconductor component to the fixed pick-up point by translational and/or rotational motion of the carrier.

6. Method as claimed in claim 1, wherein the one or more substrates are supported on a substrate holder which is rotatable to change an orientation of the substrate relative to the semiconductor components.

7. Method as claimed in claim 6, wherein after the step of rotating the carrier, the substrate holder is rotated by a same angle that the carrier was rotated.

8. Method as claimed in claim 7, wherein the substrate holder is rotated by up to 180 degrees on a horizontal plane.

9. Method as claimed in claim 1, wherein the first plurality of semiconductor components and the second plurality of semiconductor components each comprises substantially the same number of semiconductor components.

10. Method as claimed in claim 1, wherein the carrier is rotated by 180 degrees.

11. Method as claimed in claim 1, further comprising the step of rotating a pick tool of the transfer device to change the orientation of the semiconductor component relative to the substrate after picking up each semiconductor component but before bonding it onto a respective bonding position.

12. Method as claimed in claim 11, wherein the pick tool is rotated by a same angle that the carrier was rotated.

13. Method as claimed in claim 11, wherein the transfer device is rotated by 180 degrees.

Claims

1. Method of bonding an array of semiconductor components onto one or more substrates, comprising the steps of:

providing a first plurality of semiconductor components and a second plurality of semiconductor components on a carrier;

locating the first plurality of semiconductor components for pick-up by a transfer device;

picking up each semiconductor component comprised in the first plurality of semiconductor components with the transfer device and bonding it onto a respective bonding position on the one or more substrates;

after the first plurality of semiconductor components have been picked up and bonded, rotating the carrier and locating the second plurality of semiconductor components for pick-up by the transfer device; and thereafter

picking up each semiconductor component comprised in the second plurality of semiconductor components with the transfer device;

rotating a pick tool of the transfer device to change the orientation of the semiconductor component relative to the substrate after picking up each semiconductor component comprised in the second plurality of semiconductor components, but before bonding it onto a respective bonding position; and

bonding each semiconductor component comprised in the second plurality of semiconductor components onto a respective bonding position on the one or more substrates.

2. Method as claimed in claim 1, wherein the semiconductor components comprise semiconductor dice of a circular semiconductor wafer, and the semiconductor dice are arranged in an array.

3. Method as claimed in claim 2, wherein the first plurality of semiconductor dice extends for a first half of the wafer, and the second plurality of semiconductor dice extends for a second half for the wafer.

4. Method as claimed in claim 3, wherein all the semiconductor dice comprised in the first half of the wafer are picked up before the carrier is rotated.

5. Method as claimed in any one of the preceding claims, wherein the semiconductor components are picked from a fixed pick-up point, and picking up each semiconductor component further comprises the step of moving said semiconductor component to the fixed pick-up point by translational and/or rotational motion of the carrier.

6. Method as claimed in any one of the preceding claims, wherein the one or more substrates are supported on a substrate holder which is rotatable to change an orientation of the substrate relative to the semiconductor components.

7. Method as claimed in claim 6, wherein after the step of rotating the carrier, the substrate holder is rotated by a same angle that the carrier was rotated.

8. Method as claimed in claim 7, wherein the substrate holder is rotated by up to 180 degrees on a horizontal plane.

9. Method as claimed in any one of the preceding claims, wherein the first plurality of semiconductor components and the second plurality of semiconductor components each comprises substantially the same number of semiconductor components.

10. Method as claimed in any one of the preceding claims, wherein the carrier is rotated by 180 degrees.

11. Method as claimed in any one of the preceding claims, wherein the pick tool is rotated by a same angle that the carrier was rotated.

12. Method as claimed in any one of the preceding claims, wherein the transfer device is rotated by 180 degrees.

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