

expansion from causing it to become difficult to maintain the space between chips stably, a method of maintaining space between the chips (hereinafter referred to as the "kerf width" by shrinking the tape after the expand process has been proposed.

RELATED ART

Patent Documents

[0011] Patent Document 1: JP2007-A-5530

Patent Document 2: JP2003-A-338467

Patent Document 3: JP2004-A-273895

Patent Document 4: JP2011-A-216508

SUMMARY

[0012] On the other hand, there was a problem in that the kerf width expansion could not be retained during the shrink process, causing re-adhering of the adhesive layer, which leads to defects occurring in the pickup process.

[0013] Embodiments of the present invention seek to provide a semiconductor processing tape that may show excellent pickup properties and sufficient kerf width extension in the tape shrinkage process, thereby causing no displacement in chip position.

[0014] According to an aspect of the present invention, there is provided a semiconductor processing tape, which comprises a removable adhesive tape that is provided with a substrate film and a removable adhesive layer formed on at least one side of the substrate film, wherein,
in the process of fragmenting the adhesive by expansion, when the tensile elongation of the removable adhesive tape according to the method of JIS7162 is 10%, the relationship between the stress of the substrate alone and the stress of the removable adhesive tape, is: stress on removable adhesive tape/stress on substrate alone = 1 or less.

[0015] Furthermore, the semiconductor processing tape is characterized in that in that it is utilized in a method for producing a semiconductor device, which comprises:
(a) a process of adhering a surface protection tape on the front side of a wafer on

remove the slack that occur during the expand process; and

(h) a pickup process of picking up the chip with the adhesive layer attached thereto from the removable adhesive layer of the semiconductor processing tape.

[0020] Furthermore, embodiments of the present invention relate to a semiconductor device that utilizes the semiconductor processing tape.

Effect of the Invention

[0021] By using the semiconductor processing tape in accordance with embodiments of the present invention, the even expansion without change in the kerf width may be made possible. Thus, a highly reliable semiconductor device, in which the chip position does not deviate and pickup defect does not occur, can be obtained.

BRIEF DESCRIPTION OF DRAWINGS

[0022] [FIG. 1] FIG. 1 is a cross-sectional diagram that shows the structure of the semiconductor processing tape of an embodiment of the present invention.

[FIG. 2] FIG. 2 is a cross-sectional diagram that shows a state in which a surface protection tape is adhered to wafer.

[FIG. 3] FIG. 3 is a cross-sectional diagram that describes the process of adhering a wafer and a ring frame to the semiconductor processing tape of the present invention.

[FIG. 4] FIG. 4 is a cross-sectional diagram that describes the process of peeling the surface protection tape from the front side of a wafer.

[FIG. 5] FIG. 5 is a cross-sectional diagram that describes the formation of a modified region in the wafer by laser processing.

[FIG. 6] FIG. 6(a) is a cross-sectional diagram that shows the semiconductor processing tape of the present invention mounted on an expansion machine; FIG. 6 (b) is a cross-sectional diagram that shows the process of dividing the wafer into chips by expanding the semiconductor processing tape; FIG. 6 (c) is a cross-sectional diagram that shows the semiconductor processing tape, the adhesive layer, and the chip after expansion.