found that the base material layer may not sufficiently follow the convex part.

[0007]

The present invention was made in consideration of these circumstances, and aims to provide an adhesive sheet for back grinding capable of enhance followability of a base material layer to a convex part of a semiconductor wafer.

Solution to Problem

[0008]

According to the present invention, provided are:

(1) an adhesive sheet for back grinding of a semiconductor wafer having a convex part, comprising: a base material layer; and an adhesive layer provided on the base material layer, wherein: the adhesive layer comprises an opening part having a diameter smaller than a diameter of the semiconductor wafer; the adhesive layer is adhered to an outer peripheral part of the semiconductor wafer such that the convex part of the semiconductor wafer is placed in the opening part; the adhesive layer is configured so that the convex part is protected by the base material layer with the semiconductor wafer adhered to the adhesive layer; the base material layer comprises a cushion layer and a barrier layer; and an oxygen permeability of the base material layer at 25°C and at RH0% measured based on JIS K 7126-2 (isobaric method) is 1000 ml/(m^2·24h·atm) or lower,

(2) the adhesive sheet of (1), wherein the barrier layer is provided on an opposite side of the adhesive layer as viewed from the cushion layer,

(3) the adhesive sheet of (1) or (2), wherein the convex part is protected by being embedded in the base material layer,

(4) the adhesive sheet of any one of (1) to (3), wherein the semiconductor wafer is adhered to the adhesive layer under reduced pressure,

(5) a method for manufacturing a semiconductor wafer using the adhesive sheet of any one of (1) to (4), comprising: a frame adhering step; a wafer adhering step; a heating step; a cutting step; a resin curing step; and a grinding step, wherein: in the frame adhering step, the adhesive sheet is adhered to a ring frame; in the wafer adhering step, the adhesive sheet is adhered to the outer peripheral part of the semiconductor wafer under reduced pressure, the outer peripheral part on a surface of the semiconductor wafer where the convex part is provided; in the heating step, the base material layer is heated; in the cutting step, the adhesive sheet is cut along an outer periphery of the semiconductor wafer; in the resin curing step, the base material layer is brought in contact with a curable resin after the wafer adhering step, and the curable resin is cured in that state; and in the grinding step, a backside of the semiconductor wafer is ground, and

(6) a base material sheet, comprising: a cushion layer; and a barrier layer, wherein an oxygen permeability of the base material

sheet at 25°C and at RH0% measured based on JIS K 7126-2 (isobaric method) is 1000 ml/(m^2·24h·atm) or lower.

[0009]

The inventors of the present invention conducted an intensive study and found that the oxygen permeability of the base material layer is reduced by providing the barrier layer, which solve the above-described problems, leading to the completion of the present invention.

Brief Description of Drawings

[0010]

Fig. 1 is a cross-sectional view showing a state before adhering a ring frame 3 to an adhesive sheet 10 of one embodiment of the present invention.

Fig. 2 is a cross-sectional view showing a state after adhering the ring frame 3 to the adhesive sheet 10 from the state in Fig. 1.

Fig. 3 is a cross-sectional view showing a state after adhering a semiconductor wafer 4 to the adhesive sheet 10 and placing it inside a decompression chamber 16 from the state in Fig. 2.

Fig. 4 is a cross-sectional view showing a state after removing the semiconductor wafer 4 to which the adhesive sheet 10 is adhered from the decompression chamber 16 from the state in Fig. 3.

Fig. 5 is a cross-sectional view showing a state after removing the ring frame 3 and sucking the semiconductor wafer 4 by a decompression unit 6 from the state in Fig. 4.

Fig. 6 is a cross-sectional view showing a state in which the adhesive sheet 10 is pressed against a curable resin 8 and the curable resin 8 is being cured from the state in Fig. 5.

Fig. 7 is a cross-sectional view showing a state after completion of curing the curable resin 8 from the state in Fig. 6.

Fig. 8 is a cross-sectional view showing a state after grinding a backside 4b of the semiconductor wafer 4 from the state in Fig. 7.

Fig. 9 is a cross-sectional view showing a state after peeling the semiconductor wafer 4 from the adhesive sheet 10 from the state in Fig. 8.

Fig. 10 is a cross-sectional view showing a base material sheet 11 of one embodiment of the present invention.

Description of Embodiments

[0011]

Hereinafter, embodiments of the present invention will be described. Various features shown in the following embodiments can be combined with each other. In addition, the invention can be made independently for each feature.

[0012]

1. Adhesive Sheet

An adhesive sheet 10 of one embodiment of the present invention will be described using Figs. 1 to 9. The adhesive sheet

CLAIMS

1. An adhesive sheet for back grinding of a semiconductor wafer having a convex part, comprising: a base material layer; and an adhesive layer provided on the base material layer, wherein:

the adhesive layer comprises an opening part having a diameter smaller than a diameter of the semiconductor wafer;

the adhesive layer is adhered to an outer peripheral part of the semiconductor wafer so that the convex part of the semiconductor wafer is placed in the opening part;

the adhesive layer is configured so that the convex part is protected by the base material layer with the semiconductor wafer adhered to the adhesive layer;

the base material layer comprises a cushion layer and a barrier layer;

the cushion layer is configured of a thermoplastic resin having a softening temperature of 45 to 200°C as measured based on JIS K 7206 and a melting point of 60 to 200°C as measured based on JIS K 7121; and

an oxygen permeability of the base material layer at 25°C and at RH0% measured based on JIS K 7126-2 (isobaric method) is 1000 ml/(m^2·24h·atm) or lower.

2. The adhesive sheet of Claim 1, wherein the barrier layer has a thickness of 5 to 50μm and the cushion layer has a thickness of 100 to 350μm.

3. The adhesive sheet of Claim 1 or 2, wherein the barrier layer is provided on an opposite side of the adhesive layer as viewed from the cushion layer.

4. The adhesive sheet of any one of Claim 1 to Claim 3, wherein the convex part is protected by being embedded in the base material layer.

5. The adhesive sheet of any one of Claim 1 to Claim 4, wherein the semiconductor wafer is adhered to the adhesive layer under reduced pressure.

6. A method for manufacturing a semiconductor wafer using the adhesive sheet of any one of Claim 1 to Claim 5, comprising: a frame adhering step; a wafer adhering step; a heating step; a cutting step; a resin curing step; and a grinding step, wherein:

in the frame adhering step, the adhesive sheet is adhered to a ring frame;

in the wafer adhering step, the adhesive sheet is adhered to the outer peripheral part of the semiconductor wafer under reduced pressure, the outer peripheral part on a surface of the semiconductor wafer where the convex part is provided;

in the heating step, the base material layer is heated;

in the cutting step, the adhesive sheet is cut along an outer periphery of the semiconductor wafer;

in the resin curing step, the base material layer is brought in contact with a curable resin after the wafer adhering step, and the curable resin is cured in that state; and

in the grinding step, a backside of the semiconductor wafer is ground.

7. A base material sheet, comprising: a cushion layer; and a barrier layer, wherein

the cushion layer is configured of a thermoplastic resin having a softening temperature of 45 to 200°C as measured based on JIS K 7206 and a melting point of 60 to 200°C as measured based on JIS K 7121; and

an oxygen permeability of the base material sheet at 25°C and at RH0% measured based on JIS K 7126-2 (isobaric method) is 1000 ml/(m^2·24h·atm) or lower.

8. The base material sheet of Claim 7, wherein the barrier layer has a thickness of 5 to 50μm and the cushion layer has a thickness of 100 to 350 μm.