CLAIMS

[Claim 1] A method for manufacturing a semiconductor device, the method comprising:

a step of preparing a substrate having a recess;

a step of disposing a first semiconductor element in the recess of the substrate;

a step of preparing a laminate of a film-like adhesive composed of a thermosetting resin composition and a second semiconductor element by dicing;

a step of pressing the laminate against the substrate so that the film-like adhesive covers a region including the recess in the substrate and the first semiconductor element is embedded in the film-like adhesive; and

a step of sealing the first semiconductor element with a cured product of the film-like adhesive by heating the film-like adhesive, wherein

an area of the recess is smaller than an area of the second semiconductor element, and

a depth of the recess is 10 to 30% with respect to a height of the first semiconductor element.

[Claim 2] The method for manufacturing a semiconductor device according to claim 1, wherein the area of the recess is 30 to 80% with respect to the area of the second semiconductor element.

[Claim 3] The method for manufacturing a semiconductor device according to claim 1 or 2, wherein a thickness of the film-like adhesive is 60 to 150 μm.

[Claim 4] The method for manufacturing a semiconductor device according to any one of claims 1 to 3, wherein in a state where the first semiconductor element is disposed in the recess, a gap between the first semiconductor element and a side surface of the recess is 1.2 to 5 mm.

[Claim 5] The method for manufacturing a semiconductor device according to any one of claims 1 to 4, wherein a shear viscosity at any temperature of 60°C to 150°C of the film-like adhesive is 5000 Pa·s or less.

[Claim 6] The method for manufacturing a semiconductor device according to any one of claims 1 to 5, wherein the substrate has a circuit pattern on a surface, and

the method further includes a first wire bonding step of electrically connecting the first semiconductor element and the circuit pattern to each other.

[Claim 7] The method for manufacturing a semiconductor device according to claim 6, further comprising:

a second wire bonding step of electrically connecting the second semiconductor element and the circuit pattern to each other; and

a step of sealing the second semiconductor element and the second wire with a resin composition.

[Claim 8] The method for manufacturing a semiconductor device according to any one of claims 1 to 7, further comprising a step of stacking a third semiconductor element above the second semiconductor element.

[Claim 9] The method for manufacturing a semiconductor device according to any one of claims 1 to 8, wherein the first semiconductor

element is sealed with a cured product of the film-like adhesive by heating the film-like adhesive under a pressurized atmosphere.

[Claim 10] A semiconductor device comprising:

a substrate having a recess;

a first semiconductor element disposed in the recess;

a first sealing layer disposed to cover a region including the recess in the substrate and sealing the first semiconductor element; and

a second semiconductor element disposed to cover a surface in the first sealing layer opposite to the side of the substrate, wherein

the first sealing layer is composed of a cured product of a film-like adhesive composed of a thermosetting resin composition, and

an area of the recess is smaller than an area of the second semiconductor element, and

a depth of the recess is 10 to 30% with respect to a height of the first semiconductor element.

[Claim 11] The semiconductor device according to claim 10, wherein the area of the recess is 30 to 80% with respect to the area of the second semiconductor element.

[Claim 12] The semiconductor device according to claim 10 or 11, wherein a gap between the first semiconductor element and a side surface of the recess is 1.2 to 5 mm.

[Claim 13] The semiconductor device according to any one of claims 10 to 12, wherein a thickness of the substrate is 90 to 140 μm.

[Claim 14] The semiconductor device according to any one of claims 10 to 13, further comprising:

a circuit pattern formed on a surface of the substrate; and

a first wire electrically connecting the first semiconductor element and the circuit pattern to each other.

[Claim 15] The semiconductor device according to claim 14, further comprising:

a second wire electrically connecting the second semiconductor element and the circuit pattern to each other; and

a second sealing layer sealing the second semiconductor element and the second wire.

[Claim 16] The semiconductor device according to any one of claims 10 to 15, further comprising a third semiconductor element stacked above the second semiconductor element.