CLAIMS

1. A temporary protective film for semiconductor sealing molding, comprising a support film and an adhesive layer provided on one surface or both surfaces of the support film,

wherein the temporary film is used for temporarily protecting a lead frame during sealing molding of forming a sealing layer that seals a semiconductor element, by attaching the temporary protective film at an adhesion temperature of 150°C or higher and 400°C or lower to the surface on the side opposite to the surface where the semiconductor element is mounted or the semiconductor element is to be mounted, and

a coefficient of linear expansion at 30°C to 200°C of the temporary protective film is greater than or equal to 16 ppm/°C and less than or equal to 20 ppm/°C in at least one in-plane direction of the temporary protective film.

2. The temporary protective film for semiconductor sealing molding according to claim 1, wherein the thickness of the adhesive layer is 9 μm or less.

3. The temporary protective film for semiconductor sealing molding according to claim 1 or 2, wherein an elastic modulus at 30°C of the temporary protective film is 9 GPa or less.

4. The temporary protective film for semiconductor sealing molding according to any one of claims 1 to 3, wherein an elastic modulus at 230°C of the adhesive layer is 1 MPa or more.

5. The temporary protective film for semiconductor sealing molding according to any one of claims 1 to 4, wherein the adhesive layer contains a thermoplastic resin having an amide group, an ester group, an imide group, an ether group, or a sulfone group.

6. The temporary protective film for semiconductor sealing molding according to any one of claims 1 to 5, wherein the adhesive layer contains a thermoplastic resin having an amide group, an ester group, an imide group, or an ether group.

7. The temporary protective film for semiconductor sealing molding according to any one of claims 1 to 5, wherein the support film is a film of a polymer selected from the group consisting of an aromatic polyimide, an aromatic polyamide, an aromatic polyamideimide, an aromatic polysulfone, an aromatic polyethersulfone, a polyphenylene sulfide, an aromatic polyether ketone, a polyallylate, an aromatic polyether ether ketone, and polyethylene naphthalate.

8. The temporary protective film for semiconductor sealing molding according to any one of claims 1 to 7,

wherein the adhesive layer is provided on one surface of the support film, and

a ratio of a thickness of the adhesive layer to a thickness of the support film is 0.2 or less.

9. The temporary protective film for semiconductor sealing molding according to any one of claims 1 to 8,

wherein the adhesive layer is provided on one surface of the support film, and

the temporary protective film further includes a non-adhesive layer provided on a surface of the support film, the surface being on the opposite side of the surface provided with the adhesive layer.

10. The temporary protective film for semiconductor sealing molding according to claim 9, wherein a ratio of a thickness of the adhesive layer to a thickness of the non-adhesive layer is 1.0 to 2.0.

11. A reel body, comprising a winding core and the temporary protective film for semiconductor sealing molding according to any one of claims 1 to 10wound around the winding core.

12. A package, comprising the reel body according to claim 11; and a packaging bag accommodating the reel body.

13. A packing material, comprising the package according to claim 12; and a packing box accommodating the package.

14. A method for producing a semiconductor device, comprising, in the following order:

a step of attaching the temporary protective film for semiconductor sealing molding according to any one of claims 1 to 10 on one surface of a lead frame having a die pad and an inner lead, in a direction in which an adhesive layer of the temporary protective film comes into contact with the lead frame, and an in-plane direction of the temporary protective film, in which the coefficient of linear expansion at 30°C to 200°C is higher than or equal to 16 ppm/°C and lower than or equal to 20 ppm/°C, runs parallel to a shorter side in a case where the outer periphery of the lead frame is a rectangular shape, and parallel to any one side in a case where the outer periphery of the lead frame has a square shape;

a step of mounting a semiconductor element on a surface of the die pad, the surface being on the opposite side of the temporary protective film;

a step of providing a wire for connecting the semiconductor element and the inner lead;

a step of forming a sealing layer sealing the semiconductor element and the wire, and thereby obtaining a sealing molded body having a lead frame, a semiconductor element, and a sealing layer; and

a step of peeling off the temporary protective film from the sealing molded body, and

wherein the temporary protective film for semiconductor sealing molding is attached to one side of the lead frame at an adhesion temperature of 150°C or higher and 400°C or lower.

15. A method according to claim 14,

wherein the lead frame has a plurality of die pads, and a semiconductor element is mounted on each of the plurality of die pads, and

the method further comprises a step of dividing the sealing molded body before or after peeling off the temporary protective film from the sealing molded body, and thereby obtaining semiconductor devices each having one die pad and one semiconductor element.