CLAIMS

1. A semiconductor device comprising:

a semiconductor element having an electrode pad;

a substrate over which the semiconductor element is mounted and which has an electrical bonding part;

a bonding wire electrically connecting the electrode pad to the electrical bonding part; and

a body of an encapsulating resin encapsulating said semiconductor element and said bonding wire and composed of a cured product of a thermosetting resin composition,

wherein a main metal component of said electrode pad is the same as or different from a main metal component of said bonding wire, and

wherein when the main metal component of said electrode pad is different from the main metal component of said bonding wire, a rate of interdiffusion of the main metal component of said bonding wire and the main metal component of said electrode pad at a junction of said bonding wire and said electrode pad under a post-curing temperature of the encapsulating resin is lower than that of interdiffusion of gold (Au) and aluminum (Al) at a junction of aluminum (Al) and gold (Au) under the post-curing temperature.

2. The semiconductor device according to claim 1,

wherein the main metal component of said electrode pad is gold (Au) or palladium (Pd), and

wherein the main metal component of said bonding wire is gold (Au), copper (Cu), or silver (Ag).

3. The semiconductor device according to claim 1 or 2, which is used in automobiles.

4. The semiconductor device according to any one of claims 1 to 3, wherein said bonding wire contains gold (Au) in an amount of 99 mass% or more with respect to a total mass of metal components constituting said bonding wire.

5. The semiconductor device according to claim 4, wherein said electrode pad consists of gold (Au).

6. The semiconductor device according to claim 4, wherein said electrode pad consists of palladium (Pd).

7. The semiconductor device according to any one of claims 1 to 6,

wherein said substrate is a lead frame having a die pad portion, and

wherein said semiconductor element is mounted over the die pad portion.

8. The semiconductor device according to any one of claims 1 to 7, wherein said body of the encapsulating resin is a cured product of an epoxy resin composition containing an epoxy

resin (A), a curing agent (B), and an inorganic filler (C).

9. The semiconductor device according to claim 8, wherein the epoxy resin (A) is a polyfunctional epoxy resin.

10. The semiconductor device according to any one of claims 1 to 9, wherein the post-curing temperature of the encapsulating resin is 175°C.

CLAIMS

1. A semiconductor device which is used in automobiles comprising:

a semiconductor element having an electrode pad;

a substrate over which the semiconductor element is mounted and which has an electrical bonding part;

a bonding wire electrically connecting the electrode pad to the electrical bonding part; and

a body of an encapsulating resin encapsulating said semiconductor element and said bonding wire and composed of a cured product of a thermosetting resin composition,

wherein a main metal component of said electrode pad is the same as or different from a main metal component of said bonding wire;

wherein when the main metal component of said electrode pad is different from the main metal component of said bonding wire, a rate of interdiffusion of the main metal component of said bonding wire and the main metal component of said electrode pad at a junction of said bonding wire and said electrode pad under a post-curing temperature of the encapsulating resin is lower than that of interdiffusion of gold (Au) and aluminum (Al) at a junction of aluminum (Al) and gold (Au) under the post-curing temperature;

wherein the main metal component of said electrode pad is gold (Au) or palladium (Pd);

wherein the main metal component of said bonding wire is gold (Au), copper (Cu), or silver (Ag);

wherein said bonding wire contains gold (Au) in an

amount of 99 mass% or more with respect to a total mass of metal components constituting said bonding wire; and

wherein said electrode pad consists of gold (Au).