SUMMARY

PROBLEM TO BE SOLVED

[0006]

The coefficient of thermal conductivity of an adhesive composition obtained by the techniques described above, however, cannot be said to be sufficiently high, and an adhesive composition having a higher coefficient of thermal conductivity has been required. An object of the embodiments disclosed herein is to provide an adhesive composition sheet excellent in film thickness-wise thermal conductivity after cured.

SOLUTIONS TO THE PROBLEM

[0007]

There is provided an adhesive composition sheet containing an organic compound and inorganic particles, the adhesive composition sheet including a structure in which at least a layer A that contains an organic compound and a layer B that contains an organic compound and inorganic particles are laminated, the layer A having a content rate of the organic compound larger than the content rate of the organic compound in the layer B, and the layer A and/or the layer B containing anisotropically shaped thermal conductive inorganic particles.

[0007a]

In an aspect, there is provided an adhesive composition sheet for a semiconductor device, comprising an organic compound and inorganic particles, the adhesive composition sheet comprising a structure in which at least a layer A that contains an organic compound and a layer B that contains an organic compound and inorganic particles are laminated, the layer A having a content rate of the organic compound larger than a content rate of the organic compound in the layer B, and the layer A and/or the layer B containing anisotropically shaped thermal conductive inorganic particles wherein the layer A has a content rate of the organic compound of 60 vol% or more and 100 vol% or less and the layer B has a content rate of the organic compound of 1 vol% or more and 40 vol% or less.

[0008]

The present disclosure includes, as regards the adhesive

semiconductor device, the method comprising: the steps of bonding an electronic component to a heat dissipator or bonding electronic components to each other with an adhesive composition sheet interposed between the electronic component and the heat dissipator or between the electronic components; and curing the adhesive composition sheet, wherein the adhesive composition sheet is the adhesive composition sheet as defined above.

EFFECTS

[0011]

CLAIMS

1. An adhesive composition sheet for a semiconductor device, comprising an organic compound and inorganic particles, the adhesive composition sheet comprising a structure in which at least a layer A that contains an organic compound and a layer B that contains an organic compound and inorganic particles are laminated, the layer A having a content rate of the organic compound larger than a content rate of the organic compound in the layer B, and the layer A and/or the layer B containing anisotropically shaped thermal conductive inorganic particles wherein the layer A has a content rate of the organic compound of 60 vol% or more and 100 vol% or less and the layer B has a content rate of the organic compound of 1 vol% or more and 40 vol% or less.

2. The adhesive composition sheet according to claim 1, wherein the anisotropically shaped thermal conductive inorganic particles have a length in longitudinal direction 4 times or more and 500 times or less as long as a length in a section perpendicular to a longitudinal direction.

3. The adhesive composition sheet according to claim 1 or 2, wherein the anisotropically shaped thermal conductive inorganic particles are at least one type of inorganic particles selected from a carbon nanotube, a boron nitride nanotube, scale-shaped boron nitride, an aluminum nitride whisker, a silicon carbide whisker, and an aluminum oxide whisker.

4. The adhesive composition sheet according to any one of claims 1 to 3, wherein the layer A contains the anisotropically shaped thermal conductive inorganic particles.

5. The adhesive composition sheet according to claim 4, wherein the layer A contains the anisotropically shaped thermal conductive inorganic particles, has a content rate of the inorganic particles of 0.2 vol% or more and 40 vol% or less, and has a content rate of the organic compound of 60 vol% or more and 99.8 vol% or less.

6. The adhesive composition sheet according to any one of claims 1 to 5, wherein the layer B contains spherical thermal conductive inorganic particles.

7. The adhesive composition sheet according to claim 6, wherein the layer B contains the spherical thermal conductive inorganic particles, has a content rate of the inorganic

particles of 60 vol% or more and 99 vol% or less, and has a content rate of the organic compound of 1 vol% or more and 40 vol% or less.

8. The adhesive composition sheet according to any one of claims 1 to7, comprising a three-or-more layer structure in which the layer A and the layer B are laminated alternately.

9. A semiconductor device comprising a cured product of the adhesive composition sheet according to any one of claims 1 to 8.

10. A method of producing a semiconductor device, the method comprising: the steps of bonding an electronic component to a heat dissipator or bonding electronic components to each other with an adhesive composition sheet interposed between the electronic component and the heat dissipator or between the electronic components; and curing the adhesive composition sheet, wherein the adhesive composition sheet is the adhesive composition sheet according to claim 1.