

Patent Document 1: Japanese Patent Laid-open Publication No.
2012-59743

Patent Document 2: Japanese Patent Laid-open Publication No.
2013-187242

Patent Document 3: Japanese Patent Laid-open Publication No.
2014-209612

Patent Document 4: Japanese Patent Laid-open Publication No.
2014-156516

SUMMARY

PROBLEMS TO BE SOLVED

[0010]

An object of the embodiments disclosed herein is to provide a resin sheet for an electronic component in which hollow retainability is improved by enhancing flexibility and film strength, and water vapor permeability is low.

SOLUTIONS TO THE PROBLEMS

[0011]

The present disclosure mainly has the following configuration for achieving the above-mentioned object. In an aspect, there is provided a resin sheet for an electronic component which includes: an acrylic copolymer (a); a thermosetting resin (b); and an inorganic filler (c); and a silane coupling agent (d) having an amino group, wherein the

acrylic copolymer (a) contains 30 mol% or more of an acrylonitrile unit in constituent monomer units, and the content of the acrylic copolymer (a) is 2 wt% to 5 wt% in the resin sheet for an electronic component.

[0011a]

In another aspect, there is provided a resin sheet for an electronic component with a protective film comprising the resin sheet for an electronic component as defined above, and a protective film.

[0011b]

In another aspect, there is provided a semiconductor device comprising: a semiconductor chip mounting substrate shaped to surround a semiconductor chip mounting surface; a semiconductor chip formed on the semiconductor chip mounting substrate; and a hollow structure forming substrate, the semiconductor chip mounting substrate being connected to the hollow structure forming substrate while the resin sheet for an electronic component as defined above is interposed between the semiconductor chip mounting substrate and the hollow structure forming substrate.

[0011c] In another aspect, there is provided a method for manufacturing a semiconductor device, the method comprising the steps of: (1) forming a semiconductor chip on a substrate; and (2) laminating the resin sheet for an electronic component as defined above from the semiconductor chip side so as to cover

the semiconductor chip formed on the substrate, in this order, the method including laminating the resin sheet for an electronic component so as to form a hollow structure between the substrate and the semiconductor chip.

[0011d]

In another aspect, there is provided a method for manufacturing a semiconductor device, the method comprising the steps of: (1') forming a semiconductor chip on a semiconductor chip mounting substrate shaped to surround a semiconductor chip mounting surface; (2') laminating the resin sheet for an electronic component as defined above on a connection surface of the semiconductor chip mounting substrate to a hollow structure forming substrate or a connection surface of the hollow structure forming substrate to the semiconductor chip mounting substrate; and (3') connecting the semiconductor chip mounting substrate to the hollow structure forming substrate while the resin sheet for an electronic component is interposed between the semiconductor chip mounting substrate and the hollow structure forming substrate.

EFFECTS

[0012]

According to the present invention, a resin sheet for an electronic component which attains both hollow retainability and low-water vapor permeability can be obtained. Accordingly,

even when the resin sheet for an electronic component has a hollow structure, the hollow structure is hardly impaired in the process of, for example, curing the resin sheet for an electronic component, so that a favorable semiconductor device can be obtained. Since water vapor permeability is low, the sensitivity of a semiconductor chip in the semiconductor device is hardly impaired.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013]

Fig. 1 shows a first semiconductor device according to the present invention.

Fig. 2 shows a second semiconductor device according to the present invention.