DESCRIPTION

TITLE OF INVENTION

WIRE STRUCTURE, WIRE STRUCTURE FORMATION METHOD, AND ELECTRONIC APPARATUS

Technical Field

[0001] The invention relates to a configuration of a wire structure including a column-like bump and a looping wire which loops to stride over an electronic component and a wire structure formation method.

Related Art

[0002] It has been proposed (see, for example, Patent Literature 1), to form a wire striding over an electronic component, such as a semiconductor chip, through wire bonding, and configure electromagnetic shielding.

[0003] In the case of forming a looping wire striding over an electronic component by using the method described in Patent Literature 1, at a bonding start point side end, the wire can be raised vertically in a state in which the tip of the wire is bonded onto a substrate, and curved laterally at a large angle. Therefore, even if the bonding start point is arranged close to the electronic component, the wire does not come into contact with the electronic component. However, at a bonding end point side, since it is difficult to bend the looping wire toward the substrate, it is necessary to set the bonding end point to be away from the electronic component (see para. 0013 of Patent Literature 1). Therefore, in the case of forming a looping wire striding over an electronic component by using the method of Patent Literature 1, a wide looping wire formation space is required, and an issue that the size of the electronic apparatus is increased arises.

Citation List

Patent Literature

54 can be raised at a nearly vertical angle from the second pad 34 of the substrate 31. Accordingly, even if the tip of the second raised part 54 is bonded to a position adjacent to the second electronic component 32b, the upper part of the second raised part 54 or the bent part 56 can be suppressed from contacting the second electronic component 32b, and the wire structure 50A enabling magnetic shielding for the first to fourth electronic components 32a to 32d can be formed by using less space.

[0075] In the following, a wire structure 50B according to another embodiment is described with reference to FIG. 12. As shown in FIG. 12, the wire structure 50B is formed by a column-like bump 45a and a looping wire 50a.

[0076] The column-like bump 45a is formed on a bump point Pb1 arranged on the side of the second bond point P2 with respect to the first bond point P1 on the first pad 33. The column-like bump 45a, like the column-like bump 45 described with reference to FIGs. 1 to 9L, includes the press-bonded ball 41 and the folded part 44 of multiple segments, and the groove 48 extending in the front-rear direction is provided at the upper end.

[0077] The looping wire 50a, like the looping wire 50 described with reference to FIGs. 1 to 9L, is bonded onto the substrate 31 to be connected with the first pad 33 and the second pad 34, so as to stride over the first to fourth electronic components 32a to 32d. The looping wire 50a differs from the looping wire 50 in that the side of the first pad 33 is formed by a press-bonded ball 51a, a first raised part 53a, a bent part 56a, and a loop part 55a. The rest of the configuration is the same as the looping wire 50 as described.

[0078] As shown in FIG. 12, the first raised part 53a is a portion raised obliquely upward from the press-bonded ball 51a on the first pad 33. The bent part 56a is a portion connected with the first raised part 53a and bent toward the top of the third electronic component 32c from a rising direction at the top end of the column-like bump 45. A bent angle $\theta 2$ of the bent part 56a may range from 60° to 90°. The loop part 55a is a portion connected to the bent part 56a and