

BALL-GRID-ARRAY SOCKET

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BACKGROUND OF THE INVENTION

1. Field of the invention

This invention relates to a ball-grid-array (BGA) socket and particularly to a socket which does not need soldering of the socket contact to the printed circuit board (PCB) and which can be easily mounted or removed , and can provides good electric contact when engaging with a PCB.

15 2. Description of the prior art

Integrated circuit chip (IC chip) is widely used in computer equipments nowadays. Conventional method of attaching IC chip on PCB usually employs dip soldering process. The process is difficult to control. The IC chip terminal is prone to deformed or bent. More advanced technique employs surface mounting technology (SMT) for soldering the IC chip to the PCB. However SMT also has drawbacks when applying to high density IC chip terminals like BGA device. Notably heat transmission to the inside surface of the terminals is difficult, thus resulting in poor soldering.

The inspection of the soldering quality can not be performed inside of grid array terminals. When there is a

need for replacing the IC chip because of defect, it is not easy to do because the solder binding has to be removed. In case of BGA packaged MPU for computer, the device must be simply changeable because of computer
5 upgrade.

SUMMARY OF THE INVENTION

In view of the aforementioned problems and
10 disadvantages ,this invention provides a ball-grid-array (BGA) socket that is simple to use and easy to mount or remove IC chip.

The BGA socket according to the present invention
15 includes a base and a clamp. The clamp has hinge openings and latch openings formed therein. The base includes hinges ,latches and a plastic housing .The hinge has a movable hinge hook for engaging with a hinge opening. The latch has a snap hook to engage with a latch opening and
20 a release lever for disengaging with the latch opening. The base has contact apertures formed therein .Each contact aperture has a contact disposed therein.

When in use ,an IC chip is placed in the base.The
25 clamp is then firmly secured on the base by engaging the hinge with the hinge opening and latch with the latch opening. The contact located in the base makes firm contact with the IC chip on the top and the PCB on the bottom, and resulting in electrical conduction path

between them.

The base further has legs disposed at the bottom to facilitate positioning on PCB. The contact is formed in substantially U shape with outwardly extending upper
5 edges.

There are lances formed on the two lateral sides of the contact for securely engaging with the apertures in the base. There are protrusive bulges formed under the
10 bottom of the contact to make contact with PCB so that good electric conduction can be achieved.

The present invention can effectively resolves the soldering problem and high defective rate in BGA
15 soldering using BGA socket. The mounting or removing of IC chip is also easy and simple as there is no soldering needed between the contact and PCB. The base is fixed on PCB by soldering of the four corners of the base to PCB.

20 The rework can be reduced. The present invention can therefore significantly enhance the technology level of the IC industry.

BRIEF DESCRIPTION OF THE DRAWINGS

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The drawings disclose an illustrative embodiment of the present invention which serves to exemplify the various advantages and objects hereof, and are as follows :

FIG.1 is an exploded view of the present invention

FIG.2 is a perspective view of the present invention

FIG.3A is a fragmentary section view of the present invention in use

5 FIG.3B is a section view of a contact of the present invention in use

FIG.4 is a pictorial view, partly cutaway, of the present invention in use

10 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to Fig1 through Fig4, the BGA socket according to the present invention includes a clamp 10 and a base 20. In the clamp 10, there are provided with
15 hinge openings 11 and latch openings 12. In the base 20, there are provided with a plastic housing 23, movable hinges 21 each being engageable with a hinge opening 11, and movable latches 22 each being engaged with a latch opening 12.

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Hinge 21 has a hinge hook 211 and a release lever 222 formed there on. Plastic housing 23 has contact apertures 24 formed therein each with a contact 25 disposed inside.

25 When in use, a BGA chip 27 is disposed in the base 20. The clamp 10, is then placed upon the base over the BGA chip 27, with hinge hook 211 engages with the hinge opening 11 and snap hook 221 engages with the latch opening 12. Thus clamp 10 is firmly secured to the base 20.

Contact 25 is made in substantially U-shape form. It has outwardly extending upper edges for engaging with the leads of the IC chip 27.

5 There are lance 251 on the lateral side of the contact 25 for engaging with the apertures 24 formed in the plastic housing 23. Under the bottom of contact 25 ,there are provided with protrusive bulges 252 to make contact with PCB 28. Thus IC chip 27 can make good electric
10 contact with PCB 28 via contact 25 without the need of soldering. The mounting or removing of IC chip is simple and easy. There are also pegs 26 disposed under the base 20 to facilitate positioning on the PCB. Base 20 is fixed on PCB by soldering of the four corners of the base 20 to
15 PCB.

It thus may be seen that the present invention has significant improvement over conventional dip or SMT soldering method. It costs less because the time consuming
20 soldering process is minimized. The mounting or removing of IC chip is simple and convenient.

Many changes and modifications in the above described embodiment of the invention can, of course, be carried out
25 without departing from the scope thereof. Accordingly, to promote the progress in science and the useful arts, the invention is disclosed and is intended to be described only by the scope of the appended claims.

What is claimed is :

1. A ball-grid-array socket for integrated circuit chip comprising;
5 a clamp having a hinge opening and a latch opening ;and
a base including a movable hinge having a hinge hook, a latch having a snap hook and a release lever, and a plastic housing having a
10 plurality number of apertures each having a contact disposed therein;
whereby the clamp can be moveably engaged with the base by engaging the hinge with the hinge opening and by engaging the latch with the latch opening ,and forming
15 electric contact between the integrated circuit chip and a printed circuit board through the contact.
2. A ball-grid-array socket of claim 1, wherein the contact is formed in substantially U-shape having the
20 upper edges extended outwardly, having lance formed on each lateral side and having a protrusive bulge formed under the bottom surface thereof.
3. A ball-grid-array socket of claim 1, wherein the
25 clamp and the base are engaged together by the movable hinge, and the integrated circuit chip is disposed in the base and being held by the clamp.
4. A ball-grid-array socket of claim 3 , wherein the



contact is formed in substantially U-shape having the upper edges extended outwardly, having lance formed on each lateral side and having a protrusive bulge formed under the bottom surface thereof.

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5. A ball-grid-array socket of claim 1, further having pegs disposed under the base to facilitate positioning of the base on the printed circuit board.

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6. A ball-grid-array socket of claim 5, wherein the contact is formed in substantially U-shape having the upper edges extended outwardly, having lance formed on each lateral side and having a protrusive bulge formed under the bottom surface thereof.

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