INTEGRATED CIRCUIT PACKAGING SYSTEM WITH PAD CONNECTION AND METHOD OF MANUFACTURE THEREOF

TECHNICAL FIELD

The present invention relates generally to an integrated circuit packaging system, and more particularly to a system for an integrated circuit packaging system with connection.

BACKGROUND ART

Modern~~n~~ electronics, such as smart phones, personal digital assistants, location based services devices, enterprise class servers, or enterprise class storage arrays, are packing more integrated circuits into an ever-shrinking physical space with expectations for decreasing cost. Numerous technologies have been developed to meet these requirements. Some of the research and development strategies focus on new technologies while others focus on improving the existing and mature technologies. Research and development in the existing technologies can take a myriad of different directions.

Consumer electronics requirements demand more integrated circuits in an integrated circuit package while paradoxically providing less physical space in the system for the increased integrated circuits content. Continuous cost reduction is another requirement. Some technologies primarily focus on integrating more functions into each integrated circuit. Other technologies focus on stacking these integrated circuits into a single package. While these approaches provide more functions within an integrated circuit, they do not fully address the requirements for lower height, smaller space, and cost reduction.

having a central portion directly over a plurality of ~~the~~a first top terminal;

forming an encapsulation over the integrated circuit and the first top distribution layer; and

applying an insulation layer directly on a bottom extent of the first top distribution layer and a peripheral lead ridge lower side of the peripheral lead horizontal ridge.

7. The method as claimed in claim 6 wherein forming the peripheral lead includes forming the peripheral lead having the peripheral lead conductive plate with a recess at the peripheral lead bottom side and with a lead plate conductive material.

8. The method as claimed in claim 6 further comprising:

forming a conductive cap directly on the peripheral lead top side; and

wherein:

forming the first top distribution layer includes forming the first top distribution layer directly on the conductive cap and having a distribution layer conductive material.

9. The method as claimed in claim 6 wherein:

forming the peripheral lead includes forming the peripheral lead having a peripheral lead step portion protruding from the peripheral lead top side; and

wherein:

forming the first top distribution layer includes forming the first top distribution layer having a peripheral distribution step portion directly on the peripheral lead step portion.

10. The method as claimed in claim 6 further comprising forming a central lead directly under the integrated circuit and adjacent the peripheral lead.

~~11. An integrated circuit packaging system comprising:~~

~~a peripheral lead having a peripheral lead bottom side, a peripheral lead top side, a peripheral lead non-horizontal side, a peripheral lead horizontal ridge, and a peripheral lead conductive plate, the peripheral lead horizontal ridge protruding from the peripheral lead non-horizontal side;~~

~~a first top distribution layer on the peripheral lead top side;~~

~~an integrated circuit connected to the first top distribution layer, the integrated circuit having a central portion directly over a plurality of the first top terminal; and~~

~~an insulation layer directly on a bottom extent of the first top distribution layer and a peripheral lead ridge lower side of the peripheral lead horizontal ridge.~~

~~12. The system as claimed in claim 11 wherein the peripheral lead includes the peripheral lead conductive plate with a recess at the peripheral lead bottom side.~~

~~13. The system as claimed in claim 11 further comprising a conductive cap directly on the peripheral lead top side.~~

~~14. The system as claimed in claim 11 wherein the peripheral lead includes a peripheral lead step portion protruding from the peripheral lead top side.~~

~~15. The system as claimed in claim 11 further comprising a central lead directly under the integrated circuit.~~

~~16. The system as claimed in claim 11 further comprising an encapsulation over the integrated circuit and the first top distribution layer.~~

~~17. The system as claimed in claim 16 wherein the peripheral lead includes the peripheral lead conductive plate with a recess at the peripheral lead bottom side and with a lead plate conductive material.~~

~~18. The system as claimed in claim 16 further comprising:~~

~~a conductive cap directly on the peripheral lead top side; and~~

~~wherein:~~

~~the first top distribution layer is directly on the conductive cap and has a distribution layer conductive material.~~

~~19. The system as claimed in claim 16 wherein:~~

~~the peripheral lead includes a peripheral lead step portion protruding from the peripheral lead top side; and~~

~~wherein:~~

~~the first top distribution layer includes a peripheral distribution step portion directly on the peripheral lead step portion.~~

~~20. The system as claimed in claim 16 further comprising a central lead directly under the integrated circuit and adjacent the peripheral lead.~~