

ABSTRACT OF THE INVENTION

The invention is directed to a BGA package and method for making a BGA package in which warpage, delamination and package cracking are reduced. The inventive BGA package has a die attached to one surface of a substrate. The substrate may terminate at its opposite surface in an array of connection ports which is an integral part of the substrate. Alternatively, the array of connection ports is attached to the opposite surface of the substrate. The connection ports may be attach pads attached to the opposite surface of the substrate and solder balls or metal bumps attached to the attach pads. A matrix of molding compound fully encapsulates the substrate, die and the array of connection ports. The matrix molding compound is then ground to provide a flat surface and to expose portions of the connection ports. Another array of connection ports, such as an array of solder balls or metal bumps, may be attached to the existing array of connection ports. In another embodiment, retracting pins are positioned over the solder attach pads. The mold compound fully encapsulates the substrate, die, solder attach pads and portions of the retracting pins. Removing the retracting pins, after the encapsulation, exposes portions of the solder attach pads so that solder balls or metal bumps are attached to the exposed portions of the solder attach pads.