

SURFACE MOUNT SOLDER ASSEMBLY OF LEADLESS INTEGRATED CIRCUIT PACKAGES TO SUBSTRATES

Abstract

Described are a process for soldering at least one component having
5 solder bumps to a substrate and a process for forming solder bumps on metal pads of
an element, such as an IC package or substrate or both. The bumps are formed by
stencil printing solder paste deposits on the metal pads, heating the solder paste
deposits to reflow temperature of the solder in the solder paste deposits, and allowing
the molten solder in each deposit to coalesce and during subsequent cooling solidify
10 forming the bumps on the metal pads. The bumps are formed by conducting the
stencil printing through apertures in an ultra-thick stencil, the apertures having
trapezoidal crossection in the plane normal to the broad surfaces of the stencil with
the top opening being smaller than the bottom opening and with the walls of the
aperture sloping at an angle within a range of from 1 to 45 degrees from the vertical,
15 the solder paste having a low tackiness and high metal loading, and the solder paste
deposits covering an area which is equal to or exceeds an area of the metal pad in
any ratio between 1.5:1 and 5:1. Bumps formed in this manner lead to the formation
of reliable solder joints.

This Sheet Has Been Replaced

