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ABSTRACT OF THE DISCLOSURE

INNOVATIVE SOLDER BALL PAD STRUCTURE TO EASE DESIGN RULE, METHODS OF FABRICATING SAME AND SUBSTRATES, ELECTRONIC DEVICE ASSEMBLIES AND SYSTEMS EMPLOYING SAME

A solder ball pad for mounting and connecting of electronic devices and, more particularly, apparatus and methods providing an improved solder ball pad structure on a substrate, such as a printed circuit board ("PCB") or a semiconductor die, while enabling better use of the spaces between adjacent solder ball pads and at the same time providing increased surface area for bonding to a solder ball. Substrates, electronic device assemblies and systems incorporating the invention are also disclosed. The inventive solder ball pad structure comprises a metal pad layer that is partially exposed by an aperture in an insulative mask layer, but not exposing any surrounding substrate surface, an optional metallic or polymer interface layer formed onto at least a portion of the exposed area of the metal pad layer and onto at least a portion of a sidewall of the solder mask formed by the aperture as well as extending onto the top surface of the solder mask, a copper layer formed onto the interface layer (if used), and extending up the vertical wall and out over the top surface of the solder mask, followed by nickel and gold layers to enhance the wettability of the resulting solder ball pad surface.

FIG. 3B