Advantages of the No-Flow Underfill Process

APPLICATION NOTE

Introduction

Shock resistance is becoming more critical as portable devices are expected to survive increasingly harsh environments. Underfills have become an important part of circuit board assembly to ensure that the small area array packages can withstand mechanical and thermal shock. No-flow underfilling is a cost effective way to enhance the product's reliability.

Procedure

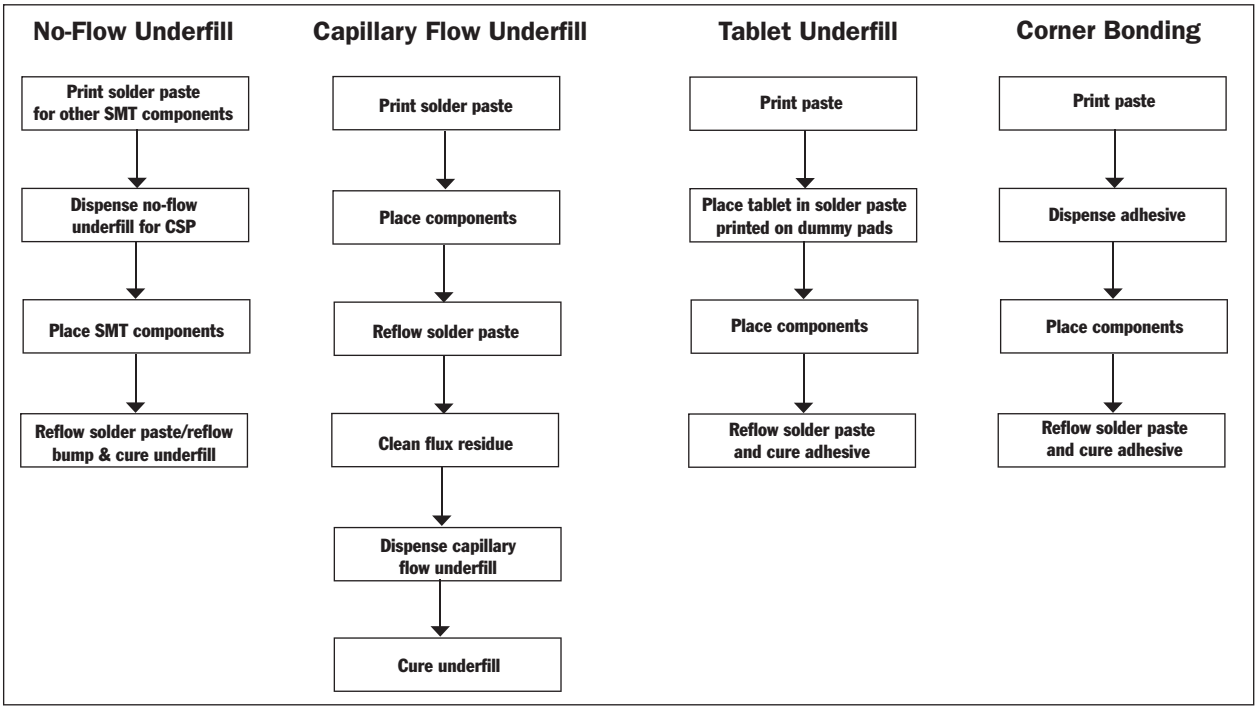
The complete no-flow process involves printing solder paste on all the pads except the BGA that is to be underfilled. Underfill is then dispensed across that BGA's pad. Component placement and reflow are the same as the typical SMT process. The underfill acts as a flux to allow the BGA balls to wet to the PCB while the solder paste is reflowing across the rest of the board. Once the BGA solder wets, the underfill cures and creates a strong epoxy bond between the component and substrate.

Advantages

The simplicity of this process is significant because, when compared to other underfill reliability enhancement methods (Figure 1), no-flow is much more cost effective and/or more reliable. No-flow has fewer process steps than capillary flow, making it a lower cost process. Because the no-flow creates an epoxy bond across the entire underside of the BGA, it is significantly more reliable than corner bonding and tablet underfilling.

Because the no-flow underfill acts as a flux, no additional flux is needed to solder the BGA. This eliminates any concerns about flux and underfill compatibility.

Figure 1



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