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Statistical Analysis of Stencil Printing Process Characteristics and Parameters

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Abstract: This research analyzes the stencil printing process (SPP) in surface mount technology (SMT) to understand the behavior of solder paste deposition for different aperture shapes and sizes. Surface mount assembly (SMA) is a process that involves SPP, pick and place (P&P) for component placement, and solder reflow. SPP is the process of depositing solder paste onto the printed circuit boards (PCB) pads through the stencil apertures by the use of squeegee. SPP is considered as the most critical process in SMA and it contributes in 60% of soldering defects. The objective of this research is to identify the significant factors affecting the SPP and improve the SPP through a comprehensive understanding of its characteristics by conducting different statistical analysis. The experimental results show that different aperture shapes and sizes have different solder paste deposition behavior. Furthermore, certain printing parameters result in quality printing while others cause poor printing application.

Keywords: Stencil Printing Process, Surface Mount Technology, Surface Mount Assembly, Printed Circuit Boards