Interplex

Press Fit Tech Bulletin

SMT Card-Edge Solutions Using Solderfree Press-Fit Technology Part 1: Application Requirements

This is the first in a new series of Tech Bulletins focusing on SMT Card-Edge solutions, which will address 1) the evolution of various SMT-to-Press-fit application requirements; 2) specifications, testing and qualifications for SMT Card-Edge Press-Fit interconnects; and 3) assembly level SMT Card-Edge Press-Fit design considerations and examples.

This Tech Bulletin addresses the first area: Application Requirements for SMT Press-Fit

Subsequent Tech Bulletin(s) will address interconnect specifications and design considerations for using SMT Card-Edge press-fit solutions.

Market Requirements: Interconnecting Mother-boards & Daughter-Boards

The growing need for SMT Card-Edge solutions using solderless press-fit technology is being driven by the evolution of interconnection requirements between daughter-boards and mother-boards.

In most cases, the main PCB or mother-board consists of a densely populated, mixed-technology SMT board that invariably represents the bulk of the material and assembly cost within these multiple board product designs. Various daughter-boards are then used to integrate special functions or to provide configuration flexibility, such as LED status indicators, power conversion, memory arrays, etc.

Maximizing production efficiency typically requires that the mother-board be fully assembled and tested prior to the integration of daughter-boards. Also, the mother-board assembly process needs to be optimized for highly-automated, mixed-technology SMT production, with secondary processes and special handling kept to a minimum.

This presents a number of key challenges, including:

- Avoiding any heating of the completed mother-board, such as secondary soldering processes
- Minimizing the interconnect footprint on densely populated mother-boards
- Maximizing automated assembly processes for both mother-boards and daughter-boards
- Reducing the high costs associated with using conventional edge-card connectors
- Assuring sufficient current-carrying capacity through the daughter-board interconnects
- Providing a high degree of mechanical strength between the boards

Using conventional edge-card connectors on the mother-board is an inherently costly approach in terms of the special processing requirements, use of excess pins and the board real estate footprint. Similarly, the use of discrete pins on the daughter-boards can be both expensive and inefficient from a production automation perspective.

This is driving the need for an entirely new approach that combines automation-friendly SMT processing with proven press-fit solderfree interconnect technology.

SMT Card-Edge Solutions Using Press-Fit Technology

SMT Card-Edge Press-Fit technology overcomes the costs and processing challenges associated with conventional approaches by enabling standard SMT placement and processing on the mother-board and proven press-fit interconnects to the daughter-boards. The use of discrete SMT Press-Fit pins also enables optimal use of every connector position for each application's requirements, without the wasted positions that are often incurred with conventional connectors.

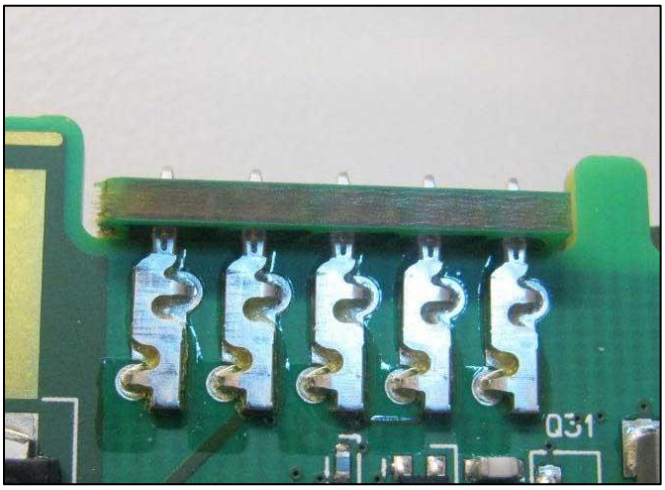

Figure 1 - SMT Card-Edge Press-Fit Assembly

Provided in standard tape-and-reel or continuous-stamped formats and using a strong through-hole SMD design for maximum mechanical strength, SMT Card-Edge Press-Fit interconnects integrate seamlessly with all of the existing processes used for assembling and soldering mixed-technology mother-boards. With proven solderfree, eye-of-the-needle press-fit contacts on the daughter-board side, this approach also completely eliminates the need for and secondary soldering operations and the risks associated with re-heating of the mother-board assembly.

Figure 2 - Optimizing Automation and Reliability

Summary

Combining the advantages of highly-automated SMT processing and proven solderfree press-fit technologies now offers a cost-effective solution to the growing needs for efficient, design-friendly and automation-ready integration of multi-board assemblies.

The next Tech Bulletin in this series will provide details on the important specifications and design issues involved with maximizing these SMT Card-Edge Press-Fit solutions for optimal assembly efficiency, product design flexibility and ongoing reliability.

Topics addressed in the next Tech Bulletin include:

- Leveraging through-hole SMD for mechanical strength
- Optimizing SMT solder flow and joint formation
- Using high-conductivity material for up to 15 Amps per contact
- Operating temperatures, contact resistance and retention strength
- Packaging for high-speed pick-and-place processing

More information regarding Press-Fit technologies and products can be found on the web by visiting www.interplex.com/pressfit or by calling (718) 961-6212.