Interplex

Tech Bulletin

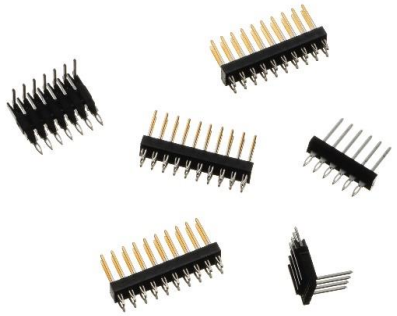
Advanced Interconnect Designs to Optimize High-Mix Production Environments

The Key to Success is using technologies that provide flexibility for easy reconfiguration, process change-overs and logistics simplicity.

This Tech Bulletin provides an overview of solutions available to meet the challenges presented by implementing an interconnect strategy within high-mix production environments.

Topics addressed in this Tech Bulletin include:

- Challenges of high-mix environments
- Bridging Industry-standard with Application-Specific
- Designing for Configurability
- Leveraging Automation in High-mix Production
- Simplifying Logistics and Inventory



Challenges of High-Mix Environments

Traditionally, high-volume low-mix production has been considered the best way to achieve optimal efficiencies and quality. However, for many manufacturers in the United States, meeting customer requirements mean dealing with high-variation/low-volume environments.

High-mix approaches can offer advantages such as, better tailoring to specific customer demand, improved responsiveness to changing market demands and lower finished goods inventories. However, high-mix has traditionally been less efficient because of the inherent variations.

Some of the key challenges of high-mix production include:

- Dealing with more frequent changeover of production set-ups
- Maintaining high quality levels across a mix of configurations
- Potentially more complex logistics for managing piece-part inventories

A key to success with high-mix environments is to minimize these inherent downsides by leveraging configurable interconnect technologies in order to maximize the benefits of being able to offer a wider range of options from within the same production environment.

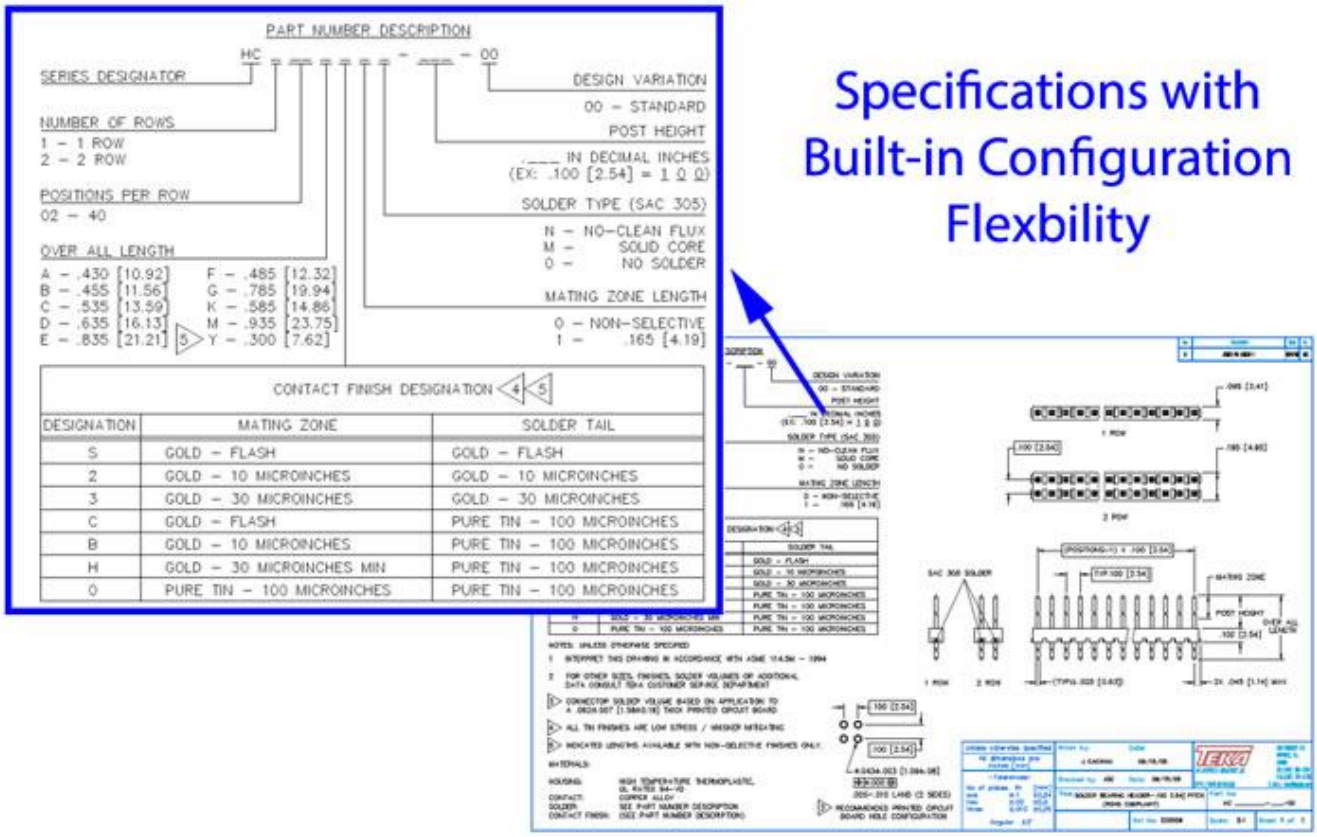
Bridging Industry-standard and Application-Specific Requirements

Whether dealing with high-volume or high-mix environments, today's manufacturers have come to rely on support for a variety of industry standards as a key element to guide their interconnect strategies. Broad standards such as PCI, PC104, PC104+, box receptacles, inline pin headers, compliant press-fit, SMT and card edge connectors form the baseline for many connector designs. Also, a number of industries have defined specific standards, such as automotive, telecommunications, power devices, medical, Mil-Spec, and others. Often these industry-based specifications build on the broader standards by specifying such things as pin diameters, press-fit parameters, pin-to-pin spacing, alloys, Solder Bearing Lead (SBL) parameters, etc.

Manufacturers then need the flexibility to leverage these broad-based and industry focused standards within application-specific parameters for their products and production environments. These include such things as the number of pins in each header, number of rows, press-fit diameters, tail lengths for through-hole pins, Solder Bearing Lead characteristics, stand-off heights, etc.

Designing for Configurability

To support these needs, interconnect vendors must design their product families with the built-in configuration flexibility to define a variety of application-specific part parameters, such as Number of Rows, Positions per Row, Post Height, Mating Zone Length, etc.



By building standards-based product families around a comprehensive and inherently flexible design methodology, interconnect vendors can quickly and cost-effectively provide manufacturers with tailored application-specific solutions that meet high-mix requirements while also delivering the consistent quality demanded by the prevailing standards.

Leveraging Automation

This standards-based configurable interconnect approach also enables manufacturers to leverage their automation assets more efficiently in a high-mix environment because the basic product family characteristics are common across a range of different application-specific parts. This can help reduce the impacts of machine set-up and change-over when moving from one product to another. The use of Solder Bearing Lead technology can also streamline production by eliminating extra process steps for applying solder and improving quality results.

In addition, continuous-reeled formats can offer the flexibility to define a range of different pin-counts and header lengths, which can be in some cases be trimmed to application-specific requirements as part of the automated production process, thereby even further improving efficiency.

Simplifying Inventory and Logistics

Another key advantage of using advanced configurable product families of interconnects is the ability to streamline logistics and inventory management. By working with a partner that approaches interconnect design from a comprehensive perspective and builds planned variability into the part specification scheme, manufacturers and leverage that methodology into their logistics stream.

From a vendor standpoint, the standards-based configurable product approach allows for much better responsiveness and shorter lead-times. The result is a better ability for high-mix manufacturers to control the production planning, inventory management and engineering change processes.

Summary

The bottom line for manufacturers with high-mix environments is a proven way to make interconnect variation requirements much more manageable. By adopting a vendor relationship that is designed to encompass both industry standards and application-specific variability, high-mix manufacturers can achieve cost savings, higher quality, lower inventory costs, and streamlined design cycles, while also future-proofing their investments in interconnect technology.