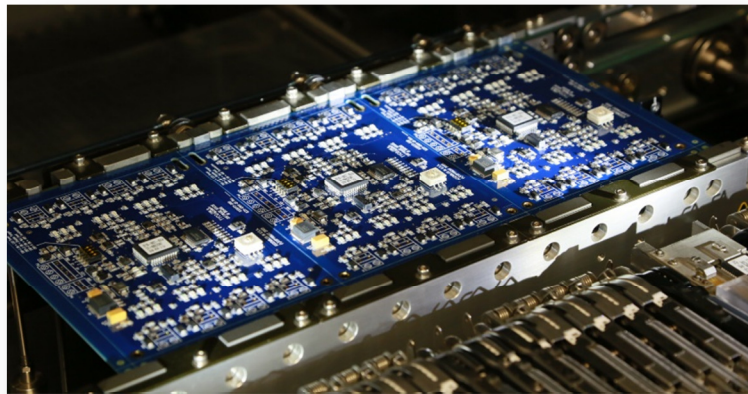




***Manufacturing Electronics.
Exceeding Expectations.***

Working Smarter Series



**Product Development: Is Your
Electronics Prototype Supplier Helping
Your Team Develop the Highest Quality
Solution?**

Product Development: Is Your Electronics Prototype Supplier Helping Your Team Develop the Highest Quality Solution?

By Scot Story

Often in the electronics prototyping process, the need for speed overrules all other supplier considerations. In the overall scheme of product development, that choice may result in a fast prototype spin, but add time to the overall product development cycle. Alternative Manufacturing, Inc., an electronics manufacturing services (EMS) provider with a volume manufacturing facility in Winthrop, Maine and a Technology Center focused on prototyping in Somerville, Massachusetts, routinely helps its customers cut design spins by addressing issues during the prototype build.

Shortening the product development cycle requires a strategic approach to the common issues that drive design respins when they aren't addressed early. The most common issues that AMI sees are:

- Lack of manufacturability
- High risk for component obsolescence or availability issues
- Unnecessary cost
- No strategy for a seamless ramp to volume production.

Ensuring Manufacturability

Product development engineers are often experts in product design but not experts in design for manufacturability (DFM). What costs pennies in the design cycle to change becomes progressively more expensive as the product nears volume production. Consequently, a focus on DFM early in the product development cycle is both cost effective and an activity that will reduce surprises as the product gets closer to production release.

Areas of common manufacturability issues include component footprint and pad mismatches, insufficient component clearances near the edge of the boards, inefficient panelization strategy, poorly designed vias in pads, lack of required tooling holes and lack of fiducials.

The team at AMI works with its prototype customers to ensure that manufacturability or process issues that could impact their development timelines are addressed early. For example, an Internet of Things (IoT) customer was rolling out a new product with a humidity sensor that required special processing as it was a non-wettable component. A no clean flux was specified. However, when environmental testing was performed, the sensor passed at 30% and 70% humidity, but failed at 90% humidity due to issues with the no clean flux. AMI contacted the relevant component and solder paste manufacturers to determine the best options. Design of experiments (DoEs) were performed on prototype runs to determine the best choice. The new flux passed the 90% humidity environmental test.



Component Issues

Product lifecycle management (PLM) is a critical part of ensuring a smooth ramp to volume production. However, design engineers often don't have the visibility needed to understand which components may be at risk. As a turnkey manufacturer, the team at AMI has the tools and partnerships to analyze both component availability and potential obsolescence risks, and provide that feedback prior to the bill of materials (BOM) and approved vendor list (AVL) being finalized. In cases where the AVL lists sole sources, they may be able to assist in developing alternate sources.

Cost Reduction

Over specification of parts or processes can drive unnecessary costs. In regulated industries, if not caught prior to product qualification testing, it may not be cost effective to address the cost reduction. AMI looks for these improvements at the prototype phase and provides feedback. For example, a customer with an automotive aftermarket product needed a housing to protect custom electronics on their printed circuit board assembly. They had found an injection molded solution that required custom injection molding tooling. The team at AMI identified an off-the-shelf part that met the customer's dimensional and performance requirements. The customer adopted the proposed solution. The tooling lead-time was eliminated and part cost was reduced from \$3.00 per unit to \$0.17 per unit.

Ensuring a Seamless Ramp to Volume Production

Working with a manufacturing partner capable of supporting both prototype and volume production, helps ensure a seamless transition. It reduces learning curve time for both teams, ensures the earliest implementation of improvement suggestions and reduces overall time-to-market, since there is often earlier coordination of long lead-time issues.

For example, an alternative energy OEM had a product with an aggressive product development cycle. The unit was extremely large and involved significant electromechanical assembly in addition to printed circuit board assembly (PCBA) manufacturing. The product introduction cycle was so short, they wanted assembled products concurrent with the design process. AMI created a video simulating the actual assembly process in volume to help the customer determine how best to have the housing they were shipping to AMI packaged for protection during transport and the most efficient unpack. AMI began building prototypes without a firm quote as the design was still in progress, tracking labor hours and material cost. The prototypes were delivered on schedule and volume production process has been defined.

Getting new products to market is often a complex process with many moving parts. AMI's **Strong Start** service package has been designed to help customers with new products address this complexity by



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providing an integrated solution that includes DfX recommendations, cost reduction suggestions, a focus on ensuring correct documentation is created for the project and detailed feedback following initial production. The benefits of working with a partner optimizing services to address specific project requirements are reduced cost and shorter time to market.

About Alternative Manufacturing, Inc.

Founded in 1989, AMI's work is found worldwide in building security systems, solar energy equipment, aircraft instrumentation, industrial laser controls, LED lighting, industrial weather stations and a host of emerging products from high-tech startups. AMI's manufacturing capabilities include printed circuit board assembly, cable and wire harness manufacturing, product testing, and final integration/box-build assembly. AMI has an Electronics Prototyping Center located in Somerville, Massachusetts and its headquarters and production facility is located in Winthrop, Maine.

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