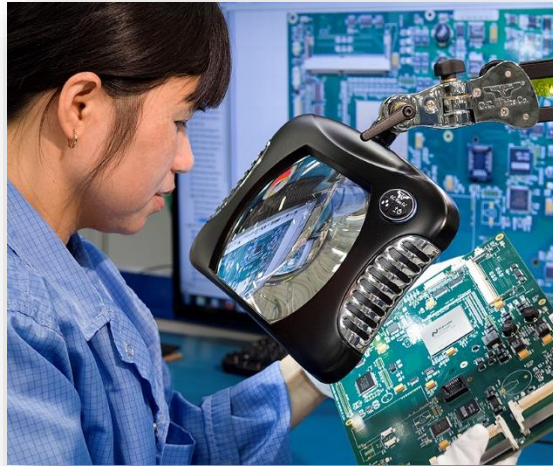


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Supply Chain Integrity: What Counterfeit Mitigation Processes are in Place at Your Contract Manufacturer?

Supply Chain Integrity: What Counterfeit Mitigation Processes are in Place at Your Contract Manufacturer?

By John Sheehan

The imbalance between electronic part supply and market demand will likely continue unabated through 2022. When scarcity drives companies to source from non-franchised brokers or resellers, counterfeit risk increases. This whitepaper looks at what constitutes a counterfeit component and best practices in screening out counterfeit parts.

Understanding Counterfeit Risk in the Current Market

The Defense Federal Acquisition Regulation Supplement (DFARS) has one of the most comprehensive definitions of a counterfeit part in its DFARS Regulation 252.246-7007 Contractor Counterfeit Electronic Part Detection and Avoidance System. It defines a counterfeit electronic part as “an unlawful or unauthorized reproduction, substitution, or alteration that has been knowingly mismarked, misidentified, or otherwise misrepresented to be an authentic, unmodified electronic part from the original manufacturer, or a source with the express written authority of the original manufacturer or current design activity, including an authorized aftermarket manufacturer. Unlawful or unauthorized substitution includes used electronic parts represented as new, or the false identification of grade, serial number, lot number, date code, or performance characteristics.”

This definition helps calibrate the many ways that genuine parts can be modified in a way that may impact product quality. In times of part of scarcity, all of these issues are possible. While there are entities that are manufacturing counterfeit parts whose packaging appears genuine but won't work, there are also entities relabeling date codes, part numbers or packaging to make an older genuine part appear to be a newer or more in demand part. Sadly, there are also entities creating websites that appear to have stock who take orders and then remove the website, never shipping parts.

In short, the risks in the current market include paying for a part that is never shipped, paying for a part that doesn't work and paying for a part that may pass simple tests but fail prematurely in the field due to age or previous storage conditions.

Mitigating Counterfeit Risk

In a situation where parts must be procured through non-franchised resellers, also known as brokers, the counterfeit risk will always be present. In cases of extreme scarcity, a broker may be unaware of part modifications until the parts are actually examined, because the broker is acting as a middleman in a transaction between an entity that is selling the parts and the company buying the parts. SigmaTron International takes a multi-layered approach to mitigating counterfeit risk that includes:

- Utilizing a pool of trusted resellers or trusted resellers referred by customers with prior experience with that company
- Requiring third-party lab testing of parts acquired through brokers
- Working only with suppliers willing to provide payment terms
- Inspecting part packaging and labelling for signs of tampering at both the supplier and in incoming quality control (IQC) as parts are received.

Even with these precautions, risk remains. For that reason, SigmaTron also requires customer written authorization, any time purchases through a broker are necessary, and acceptance of all liability for costs or quality issues related to parts procured through these channels. These terms are common practice within the electronics manufacturing services (EMS) industry and are good protection for OEMs, since this practice notifies OEMs of the option to purchase these parts while apprising them of the risk associated with purchases through this channel.

The Role of Inspection and Test

While third-party test lab destructive testing of samples within a purchased part lot will usually determine if genuine parts have been modified or if the part doesn't work, it won't catch parts whose storage conditions or handling have impaired part life. This is where production inspection and test strategy, along with trends reporting visibility are critical.

SigmaTron works with customers to design the most cost-effective inspection and test strategy for their products' characteristics, optimum test coverage and volumes. Test options include flying probe, in-circuit test (ICT), functional and environmental stress screening (ESS). Robust process control and inspection will catch most workmanship-related defects. Test coverage determines whether part failures unrelated to workmanship get caught.

Internal systems visibility is also important in monitoring part failure trends. SigmaTron International's proprietary Manufacturing Execution System (MES) system known as Tango monitors production, quality and warehouse activities. The system provides traceability, is exception-based, has enforced routing capability and integrates with the ERP system and iScore in real-time.

Tango acts as a partner with production operators tracking each assembly through all processes. On assemblies that required serialization in different formats at different parts of the process, the system ensures that the right serial number is associated with that assembly.

It also enhances real-time quality data reporting, enabling the production team to see data by serial number or the entire lot. This helps the team track trends in first pass yield and any repair activities, and quickly identify and correct their root causes. The IT team is also adding an API that will improve test data accessibility and analysis.

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Tying it all Together

Counterfeit mitigation requires a multi-prong approach which includes multiple levels of screening inventory procured through resellers/brokers, a comprehensive production inspection and test strategy, and continuous monitoring of quality data trends for indications that specific component lots may be experiencing higher rates of failure.

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