

Best Practices for Combating Counterfeit Components

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Considering the complexity of supply chains and the breadth of components being counterfeited today, keeping track of the authenticity of parts has become an increasingly challenging task for procurement professionals. The cost of undetected counterfeits for electronic companies is in upwards of \$100 billion per year (National Electronics Distributors Association). Being at the center of electronic component management, SiliconExpert has worked alongside the University of Maryland CALCE and our own customers to create a list of best practices used by OEMs and contract manufacturers to combat counterfeits. This article summarizes some of our findings for combating counterfeit components in the electronics industry.

Common Sources of Counterfeits:

Ideally, electronic parts should be procured directly from the manufacturer or authorized distributors; but often times this is not possible. Much of the growth in counterfeit parts can be attributed to manufacturers relying on third party distributors in the grey market. Counterfeiters often create products using defective parts scrapped by the supplier which include damaged, run offs, and excess inventories. Obsolete components and parts nearing their EOL are some of the most common parts to be counterfeited due to the lack of authorized distributors carrying such inventory.

Qualifying Distributor Parts Prior to Purchasing:

If there's no alternative but to rely on third party sources, OEM buyers should make the effort to request documents to confirm the authenticity and origin of goods. An effective measure for qualifying the authenticity of parts is to observe the supplier issued last time buy date and ship date against when the distributor's parts were made. Parts considered to be made after the supplier's issued dates often carry a higher chance of being counterfeit.

In addition, manufacturers can turn to community collaboration resources to address some of their concerns regarding questionable parts. One excellent resource is the GIDEP cooperative, a data exchange program between government and industry participants seeking to reduce or eliminate the use of resources by sharing technical information (GIDEP.org). Through GIDEP, members and non-members can fill out and share "suspect counterfeit reports" to assist the community with avoiding unplanned risks and costs associated with counterfeits.

Performing Visual Inspections:

When receiving parts from unauthorized distributors, the first line of defense for manufacturers is to perform visual inspections on questionable parts. Manufacturers

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should maintain a repository of authentic components used in production in order to have a reference point in the future for visual inspections against potentially compromised components. Below are some examples of some common tests used:

- * Observe and compare the lot code against the date codes on the outside of the packages for consistency.
- * Part markings on the packaging should be legible and show no evidence of sanding or signs of wearing out when performing permanency tests.
- * Look for bent or reworked pins. This indicates the parts may have been reworked from scrap/salvaged PCBAs or CCAs.
- * Check for signs of re-soldering. On some components the soldering metal is darker and stained. On others, the steel color may be peeling off to reveal copper.

Keep in mind, there are a number of limitations to performing visual inspections. Visual inspections often fail to identify defects in “As Is” components such as scrapped or reclaimed parts and excess inventories commonly used to create counterfeits. For example, some hidden discrepancies such as missing die or bond wires cannot easily be detected.

Proactively Manage Your Supply Chain:

According to Dr. Digante Das of the University of Maryland CALCE, “Inspections are no substitute for sound supply chain management methods.” In short, your time and resources are better diverted towards identifying reliable distributors or alternative crosses for your product designs.

OEMs and contract manufacturers should maintain timely updates to their part lists in order to reflect PCN and obsolescence notices which may arise. By maintaining a proactive approach to managing component lifecycles, organizations will have ample time to identify alternative cross reference parts and reduce the number of last minute purchases needed from third party sources.

Improving Accountability:

Lastly, OEMs should establish systems to improve the traceability of their products with the use of unique product identifiers and serial codes. Having systems in place allows manufacturers to maintain greater control over sub-contractors, and it ensures scrap and recycled products are disposed of properly. By establishing measures to safeguard against counterfeits, organizations can safely avoid some of the repercussions and unseen costs associated with defective products once they enter the market.

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