
Counterfeit Parts

The Scenario

Many of the capacitors used to support the power-supply filtering applications at a military installation, such as memory backup functions to bridge short power interruptions, were failing at a high rate and obviously did not meet the requirements for reliability. Identifying the cause for the failures became a top priority for the installation commander because it was crucial to avoid further disruption in the performance of the many Defense applications and systems.

During a preliminary examination, a technician noticed markings on the capacitors that did not resemble markings on capacitors used in the past. The technician suspected that the capacitors were counterfeit because further observations revealed evidence of possible tampering and remarking. The capacitors that were still in the supply chain were removed and the suspected deficient parts were reported.

An investigation by a team of criminal investigators as well as auditors ensued to determine whether the counterfeit assertion could be substantiated. As part of their investigation, the team performed a comprehensive set of tests on the capacitors which included visual inspections, validating the physical dimensions, testing the permanency of all markings, and x-ray testing. The team selected a sample of 100 capacitors to test and found a deficiency for each tested item. Specifically, the testing yielded the following results:

- Visual inspections – different and/or missing markings were found (marking were not consistent);
- Validating the physical dimensions – the physical dimensions of the parts did not match the specifications on the manufacturer’s datasheet;
- Testing the permanency of all markings – exposure to solvents caused markings to fade and smear; and
- X-ray testing - found anomalies between images for the wire bond pattern.

The team had definitive evidence that the capacitors did not have the correct quality, purity, identity and efficiency required for their intended use and were confirmed to be counterfeit. They furthered their investigation by interviewing the manufacturer to determine the origin of the capacitors.

The manufacturer informed the team that the capacitors were obtained from a distributor who was not authorized to be used. Also, the distributor failed to produce inspection reports to show that the capacitors had been thoroughly inspected and passed all inspection procedures. Furthermore, the distributor also completed paperwork that falsely certified the authenticity of the counterfeit parts.

Based on their findings, the investigative team determined that the component’s approach to monitoring and evaluating counterfeit and substandard items in the supply chain

should be strengthened to reduce the vulnerability of their supply chain to counterfeit parts. For example, they should implement quality assurance processes that include actions such as:

- Verifying that all requirements for inspection and testing by the distributor have been met prior to accepting the parts,
- Visual inspections to help ensure counterfeit parts are not received into inventory, and
- Comparisons of data deliverables to contract/purchase order requirements.

In addition, the team recommended that the component:

- Procure parts only from authorized and reliable sources,
- Control parts identified as counterfeit; maintain an internal tracking database for counterfeit items, including sources/distributors of counterfeit items and techniques used for those parts that did not conform to standards (e.g. remarking, resurfacing),
- Screen parts/components to identify and remove counterfeits before they are used in a finished product,
- Train personnel on counterfeit avoidance and prevention measures, and
- Report counterfeit parts to other potential users and government investigative authorities.

General Comments / Lessons Learned: Counterfeit parts are parts that have been misrepresented, identified, or marked as genuine, and/or altered by a source without a legal right to do so with the intent to mislead, deceive or defraud. Counterfeit parts can jeopardize the performance, reliability and safety of products, and seriously affect the integrity of a Component's operations. Components should establish procedures and practices to help mitigate the risk of counterfeit parts. The problem of counterfeit parts and substandard materials is not new, and will continue to be a challenge. However, there are steps and precautions that if followed, can reduce the risk of it happening.

FRAUD INDICATORS

- High failure rate for parts.
- Evidence of tampering.
- Parts contain different and/or missing markings.
- Physical dimensions of the parts do not match the specifications on the manufacturer's datasheet.
- Markings have a negative reaction to exposure to solvents (e.g. fade, smear).
- Anomalies are discovered on X-ray images.
- Use of an unauthorized distributor.
- Distributor fails to provide inspection reports.