

## **Tackling the Counterfeit Electronics Component Conundrum with Smart Labeling**

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Electronics manufacturers already hurting from supply chain disruptions, component shortages, and a trade war are further challenged by the rise in counterfeit components. Often made with substandard parts, some of which are recycled and many that resemble an authentic product, these fakes are frequently aimed at the defense, aerospace, automotive, and medical industries and cause safety concerns and degraded performance. Faulty components in a medical device can cause inaccurate readings or incorrect diagnosis. And defective parts in defense, aerospace, automotive can literally have life or death consequences.

A semiconductor can cost less than a cup of coffee. However, if found, the failed part's replacement can cost hundreds if not thousands of dollars in rework, inspection, and testing, not to mention the lost production and quality inspections. If the item gets out into the industry, by chance, or your home, the loss can be a simple failure to significant damage.

### **Identifying Counterfeit Semiconductors**

The semiconductor industry has significantly invested in ways to pre-inspect the products before installation on a circuit board. The two main methods used are X-ray inspection systems and acoustic microscope scanners. Both of these methods are expensive. Another approach is to inspect during the actual installation of the semiconductor onto the circuit board. Some of the more sophisticated pick and place equipment actually test the part before installing it on either SMV or through-hole applications. However, these are reactive solutions, not preventive.

### **Taking Proactive Measures**

Advances in intelligent labeling technologies enable preventive measures to keep counterfeit electronic components out of your supply chain. The first step is to know your vendors and the distribution sites the parts travel through to get to your production floor. The second step is to incorporate a complete track and trace system with engagement at each point throughout the supply chain. The track and trace system can be as easy as a simple bar code, which is scanned at each point along the supply chain. If a part is not checked at each point or is confirmed at a point where it does not belong, the production facility would receive an alert when the parts are received, or an alert would be sent to the OEM part manufacturer.

Track and trace systems have been in place for a while now. Earlier systems used technologies such as Near Field Communication (NFC) and RFID tags to track and trace shipments. Unfortunately, these tags can be easily transferred and rendered unusable if exposed to improper handling.

### **New Advances in Labeling Technology Boost Effectiveness**

Two types of security measures can be incorporated into a label structure - overt and covert. Overt is simply what the OEM wants the consumer to see to identify the product. Covert is the hidden message of part of the label structure the consumer will not see. An example of overt technology is the

hologram on the visual side of a label. An example of covert technology is the RFID tag inside a box that sets off the alarm when a consumer leaves a store if the clerk did not deactivate it.

Adding to the label's complexity makes it more difficult to counterfeit. The most powerful solutions incorporate both overt and covert technology in a single structure. With this structure, the counterfeiter will not realize the security technology is right in front of them, making it exceedingly difficult for them to counterfeit. Applying this type of technology to the rolls, unit, carton, and case during the manufacturing process and registration enables the verification of the part's authenticity. The most effective labeling technology will also allow scanning of the component throughout the supply chain and automatically update both the supplier and the customer on the passage the product took throughout its journey. As the product is checked into the distribution hub from the point of origin, the supplier and the customer (production house) can be sure the product took the correct path to the destination. They will know who handled the product and at what time and be informed if the product was in a warehouse or location not scheduled.

The use of smart label technology along with the track and trace system allows components to be monitored via a dashboard. Supply chain managers can follow components through their entire trip of the supply chain, from the moment of manufacture to the part's application. They can see whether or not the product was delayed or in the wrong location. Through the dashboard, they can also view if there is any secondary movement of the product. Smart labeling technology is the most effective and cost-efficient counterfeit prevention method on the market today.

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