

## COUNTERFEIT DETECTION AND MATERIAL VERIFICATION

The semiconductor market is plagued with **technology cloning, re-branding and mis-labeling** of substandard or defective electronic components to imitate higher-qualification EEE parts. The re-marking is done on salvaged parts from scrapped assemblies or even stolen parts. Some parts are manufactured illegally from original molds and designs. The inherent hazards of such practices result in use of in-correct die, inferior product, packages without die, false ROHS classifications etc.

### Types of Counterfeit Electronic Components

Any available components re-coded to customer order  
Reclaimed components for correct device type sold as new  
Components re-coded to a higher grade part  
Test failures from factory via unauthorized routes  
New lower grade components remarked

### Major Impacts

May not meet manufacturer's specification  
Poor yields when built into system  
Latent ESD damage from poor handling, uncertain reliability  
Mixed lots, lack of traceability  
Potential negative impact on user's reputation

### Why is Counterfeiting so rampant?

Shorter product lifetimes  
Obsolete components difficult to source  
Current components on long lead times disrupt production  
Buyers' pressure to reduce cost of materials  
Ready supply of reclaimed components from electronic scrap  
Obsolete/high reliability grade parts command a higher price

## How does Hi-Reliability Microelectronics add Value?

We have comprehensive in-house electrical testing that allows us inherent control over our analysis

HRM has extensive knowledge of original manufacturer's test protocols that enables detecting suspect products

In-depth physical analysis at die and package level

Technical know-how of original manufacturing process, device application and specifications (esp for JAN, JANTX or JANTXV)

Strategic collaboration with original manufacturer for product validation

Hi-Reliability Microelectronics (HRM) is a one-stop source for value-solutions for EEE components. It has more than 40 years of rich experience in catering to the hi-reliability test and qualification requirements of the Aerospace and Defense sectors.

HRM has developed a unique leverage with the A&D industry stalwarts by being a reliable and knowledgeable extension for their back-end semiconductor requirements

HRM offerings:

Comprehensive Parts Management  
Value-added Upscreening (more than 6,000 test programs)  
Component Level Qualification  
System Level Qualification  
Ruggedization  
Compliance Testing  
PEM Testing  
COTs Replacement  
Radiation Testing

### visual inspection

evidence of re-marking  
marking quality  
manufacturer's logo  
evidence of prior marking removal  
evidence of reclaim  
lead condition - XRF analysis

### documentation check

certificate of compliance  
date codes  
authenticity of lot codes and labels  
processing documents

### dimensions and marking

check dimensions against manufacturer's drawing  
solvent resistance testing

### electrical testing

full parametric testing  
curve trace - fingerprint analysis of inputs/outputs  
full temperature range testing  
test plan designed specifically for DUT

### non-destructive internal analysis

micro focus X-Ray  
scanning acoustic microscopy  
X-Ray fluorescence - presence of die

### destructive internal analysis

detailed examination of die and construction  
die marking from original manufacturer  
die marking for product type  
die marking for grade

### reliability check

infant mortality failures  
ESD damage  
burn-in  
long term life test