



Avoiding Counterfeit Components

2010 AVCOM

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Presented by Marty Lanning, XTREME Semiconductor



Company Information



A Texas Company founded in January 2004
Founders: Paul Hilfer and Marty Lanning
Website – www.xtremesemi.com



12908 Trails End Road, Suite E
Leander, TX 78641



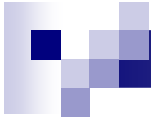
XTREME
Semiconductor

Who is XTREME Semiconductor?



- A “*Solutions*” Company, Providing Support for Obsolete, Legacy, and End-Of-Life Semiconductor Products.
 - Manufacturer of Legacy Mil/Aero Products
 - MIL-PRF-38535 QML Q Certified
 - Custom Packaging, Source Control Drawings
 - Independent Distributor offering “**Certified EOL Product**”
 - Reference Standards
 - MIL-STD-883
 - IDEA-STD-1010A
 - CCAP101
 - SAE AS5553





Avoiding Counterfeit Components

- **What is a Counterfeit Semiconductor?**
- **Why is there an Industry problem with Counterfeit Semiconductors and where are they coming from?**



Avoiding Counterfeit Components

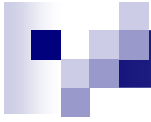
- Definition:

- Counterfeit Semiconductor:

- “The Intentional Misrepresentation or Alteration of a Product with the Intent to Defraud or Deceive the Purchaser.”*

- Common Examples:

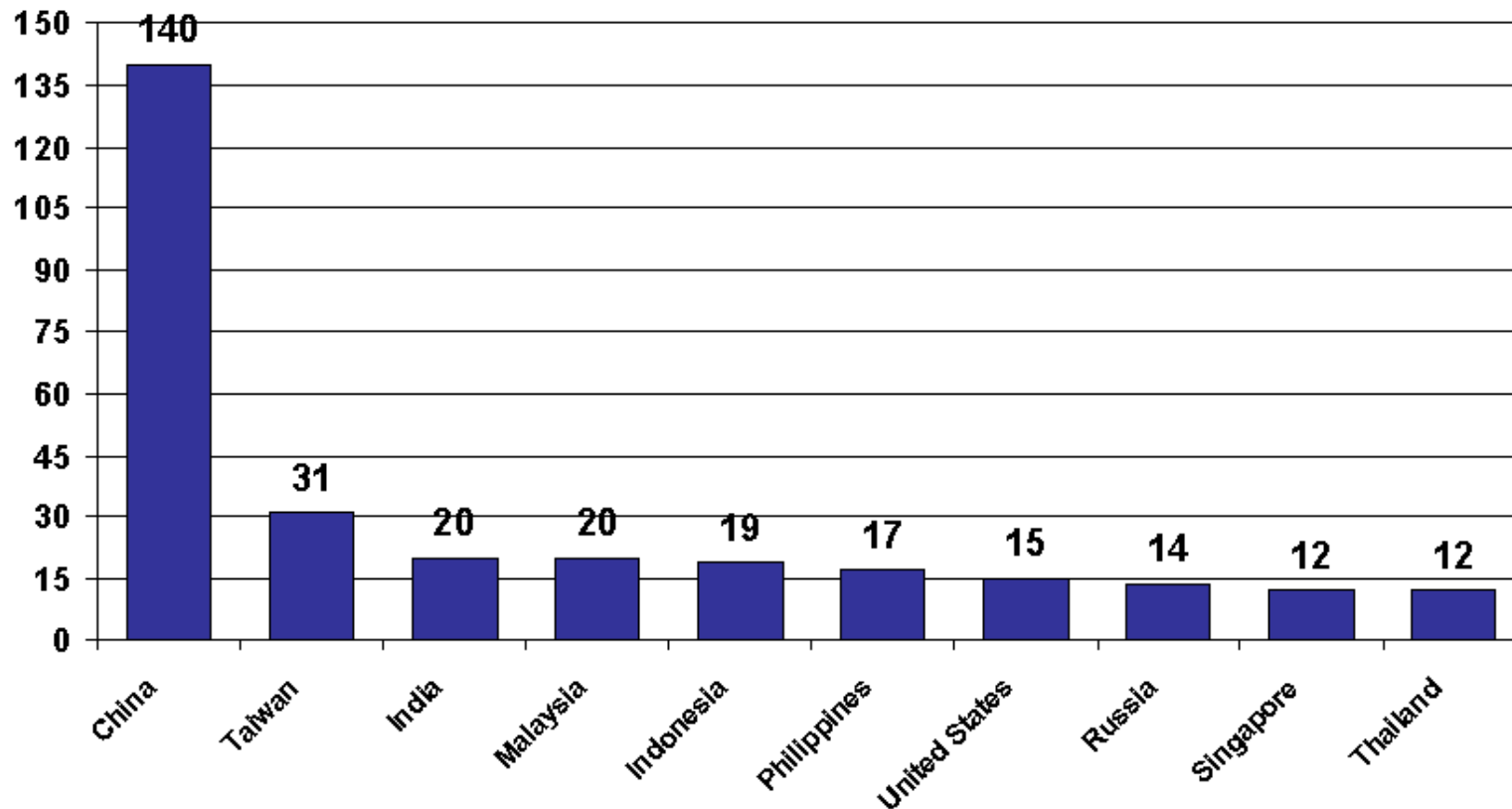
- Re-marking, Re-branding, Re-furbishing
 - Substituting Substandard or Inferior Product as Original
 - Passing One Manufactures Product Off as Another
 - Previously Used or Salvaged Product Sold as New



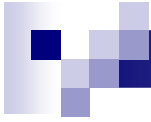
Avoiding Counterfeit Components

- **Problems Facing the Industry today:**
 - **Ongoing Demands for Obsolete Product**
 - **Minimal Support for Obsolete Products from the Original OCM**
 - **Few “Quality” Aftermarket Suppliers**
 - **Industry Accepted Quality Standards and Procedures are not Implemented by many of the Brokers and Independent Distributors Servicing this Market**
 - **Steady Stream of Counterfeit Products Entering the Market Primarily from China**

Sources of Counterfeit Components



U.S. Department of Commerce Data – Preliminary Data (as of March 4, 2009)



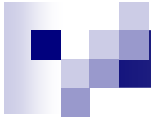
Avoiding Counterfeit Components

- So, How Do You Avoid Getting Stung by Counterfeit Components?



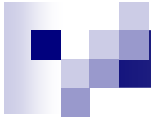
Avoiding Counterfeit Components

- **Option 1:** Buy from an Authorized or Franchised Distributor when Inventory Exists
 - Lowest Risk
 - Traceability (C of C) back to the OCM
- **Option 2:** Buy “RE-MANUFACTURED OR *VALIDATED*” product from a Trusted Aftermarket Source
 - Lower Risk Solution
 - Some offer a Product Warranty
- **Option 3:** Purchase from Brokerage or Non-Franchised Suppliers:
 - Highest Overall Risk and Cost
 - No Traceability (C of C) and No Product Warranty



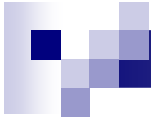
Avoiding Counterfeit Components

- **Broker Market Overview**
 - **Not All Brokers & Independent Distributors are the Same**
 - Many have minimal Quality Systems and no ESD Controls
 - **Some have No Experience in the Semiconductor Market**
 - The Internet has Created Virtual Companies
 - Product Quality is Compromised
 - **Traceability back to the Original OCM is unavailable**
 - Limited or No Product Warranty
 - No Product Support
 - **Buying Obsolete Products Requires More Support, Not Less**



Avoiding Counterfeit Components

- What is the “*True Cost*” of Receiving a Counterfeit Product? Some of the Cost to Consider are:
 - Incoming Inspection
 - Problem Solving and Disposition
 - Administrative Efforts to Process Returns
 - Processing Multiple Purchase Orders to Replace Material
 - Lost Production Time and Revenue
 - Damage to Companies Quality Reputation



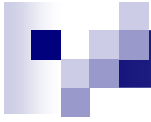
Avoiding Counterfeit Components

- **In the Big Picture, Counterfeit Semiconductors Threatens Us All Levels:**
 - **National Security at all Levels**
 - **Defense and Aerospace Industry**
 - **National Power Grid**
 - **Web and World-Wide Communication Systems**
 - **Banks and Financial Institutions**
 - **USA High Tech Industries**



Avoiding Counterfeit Components

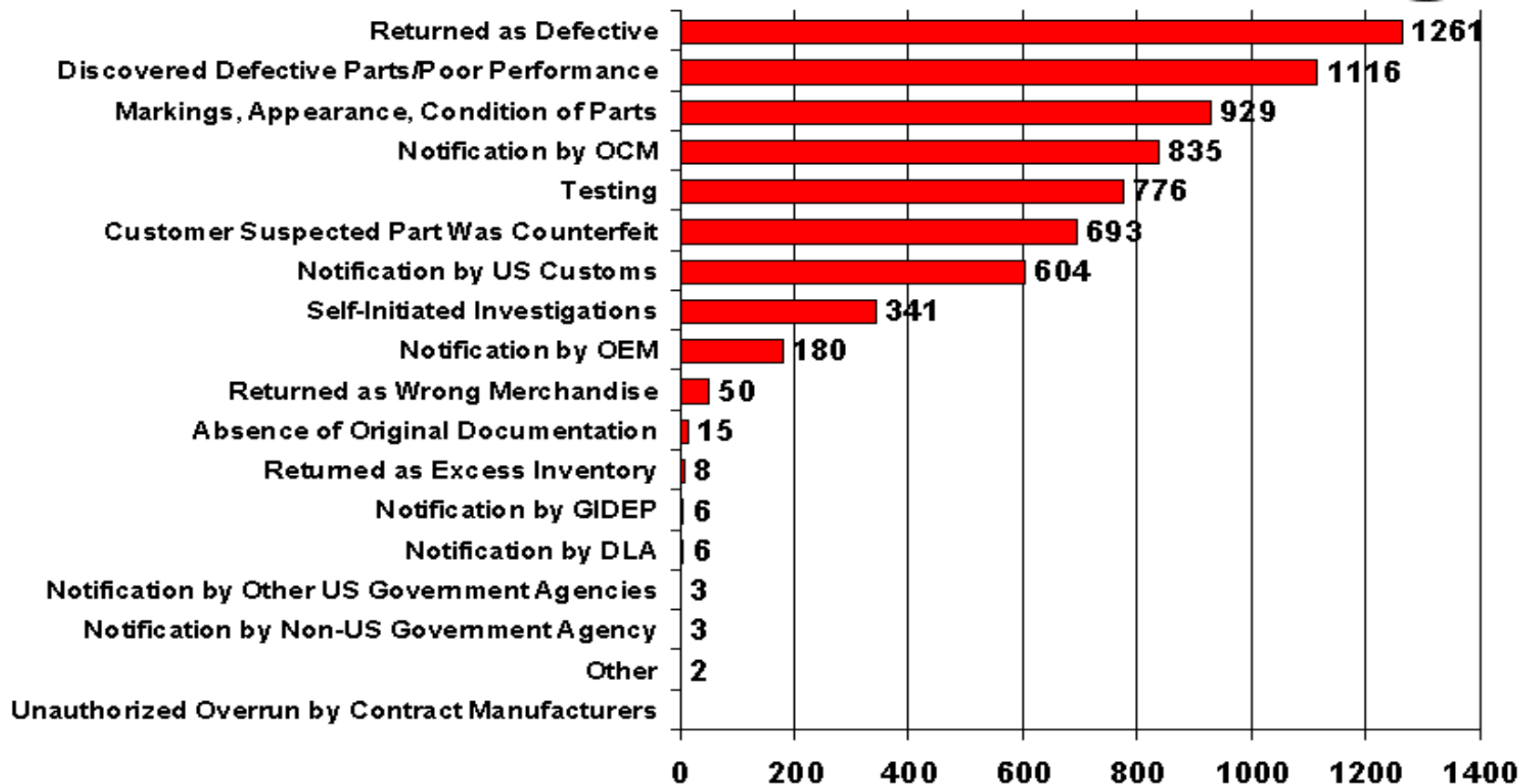
- **Industry Impact of Counterfeiting**
 - Problem is Industry-Wide; Global and Growing
 - Loss of Legitimate Sales Estimated > \$100 Billion
 - Value of Counterfeit Components > \$1-10 Billion
 - 750,000 Jobs Lost
 - Most Cases are not Documented....Just Too Many
 - Electronics Retailers Association International (ERAI)
Receives up to 200 Complaints a Month....Identified 2578
Brokers Selling Counterfeit Components
 - If counterfeiting was stopped today, it will take years to purge
the Supply Chain of these products.



Avoiding Counterfeit Components

- **What is Lot Validation and Why is it Important?**
 - **Confirming the Lot Number and Lot Date Code with OCM or other Known Good Sources**
 - **Visually Inspect for Re-marked, Used or Re-furbished Material**
 - **Confirmation of the Die Identification (Mask ID)**
 - **X-Ray to Confirm Lot Consistency**
 - **Test to Validate the Original OCM Product Specification**
- **Mitigates the Risk of Buying Counterfeit Material**

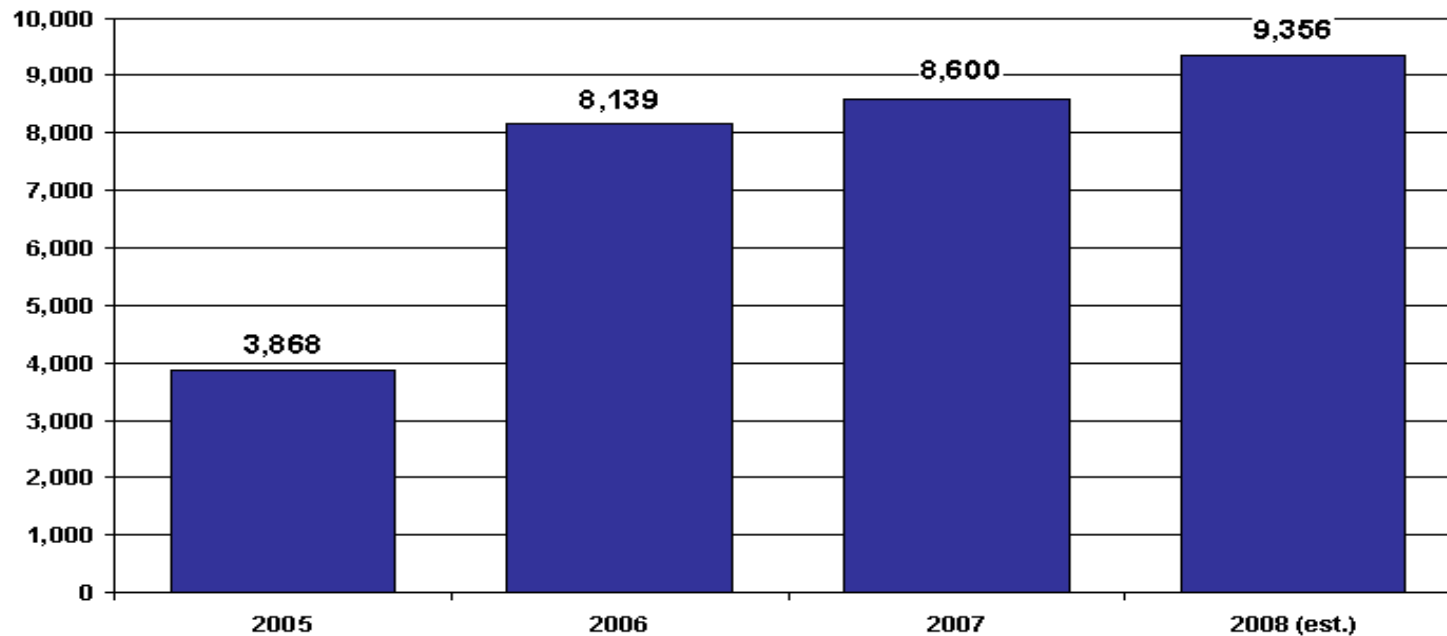
Avoiding Counterfeit Components



U.S. Department of Commerce Data – Preliminary Data (as of March 4, 2009)

Avoiding Counterfeit Components

- **Reported Counterfeit Incidents: 2005-2008**



U.S. Department of Commerce – Preliminary Data (as of March 4, 2009)



***XTREME* Solutions**

- ***XTREME* Semiconductor “*Certified EOL Product*”**
 - **Warranted to be Authentic OCM Product**
 - **Visual & Mark Permanency: Anomaly Inspection**
 - 100% up to 100pcs, RTS Sample
 - **Die ID: Die and Mask ID Verification**
 - One (1) piece minimum from each lot Date Code or Lot
 - **Electrical Test: 25°C Limited DC/ Limited Functional Testing**
 - 100% up to 100pcs
 - **X-Ray Inspection: Verifies Lot for Consistency**
 - 100% up to 100pcs
 - **Customized Test solutions:**
 - *XTREME* can provide customized “Lot Validation Plans” to meet unique customer needs or specific product applications.
 - **Warranty: Will Perform to Manufacturers Data Sheet**
 - One (1) Year from the date of shipment.... Mirrors the Original OCM Warranty





***XTREME* Solutions**

- ***XTREME* Semiconductor “*Certified EOL Product*”**
Process Development Considerations:
 - **Must be a Cost Effective Solution**
 - **Assumption: Product is Valid OCM Material**
 - **Process Objective is to Authenticate Real OCM Material**
 - **Look for Anomalies that invalidate the Primary “Assumption”**
 - **Process to be effective in Authenticating Most IC’s and Discrete Components**



***XTREME* Solutions**

- **Criteria for Sourcing Obsolete Product**
 - **Avoid Brokers/Distributors Sourcing in China**
 - **Utilize Brokers/Independent Distributions who are Active Members of IDEA or ERAI or ISO Certified**
 - **Contact Authorized Distribution: Rochester Electronics**
 - **Look for Stocking Distributors: Use sites such as Stockingdistributors.com or Parthunter.com**
 - **Do Research Prior to Buying**
 - **Request pictures, lot date information, lot numbers**
 - **Determine EOL date of product prior to purchase**



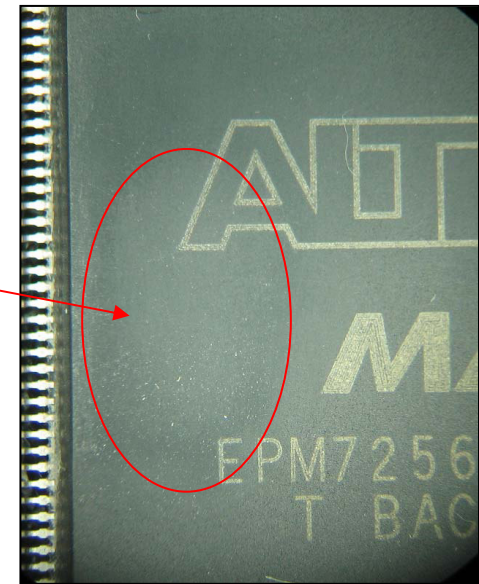
***XTREME* Solutions**

- ***“Certified EOL Product”*** Inspection Results: 2008-10
 - 30-35% of all lots inspected by *XTREME* were rejected
 - Includes bent leads, damaged or Incorrect material
 - Eighty-five (85) lots/devices types were rejected as counterfeit or unconfirmed material.
 - 15-20% of lots presented to *XTREME* from Brokers are rejected prior to purchase. Rejection criteria:
 - Visual Anomalies
 - Lot Date Code Issues
 - Refurbished or Poor Condition



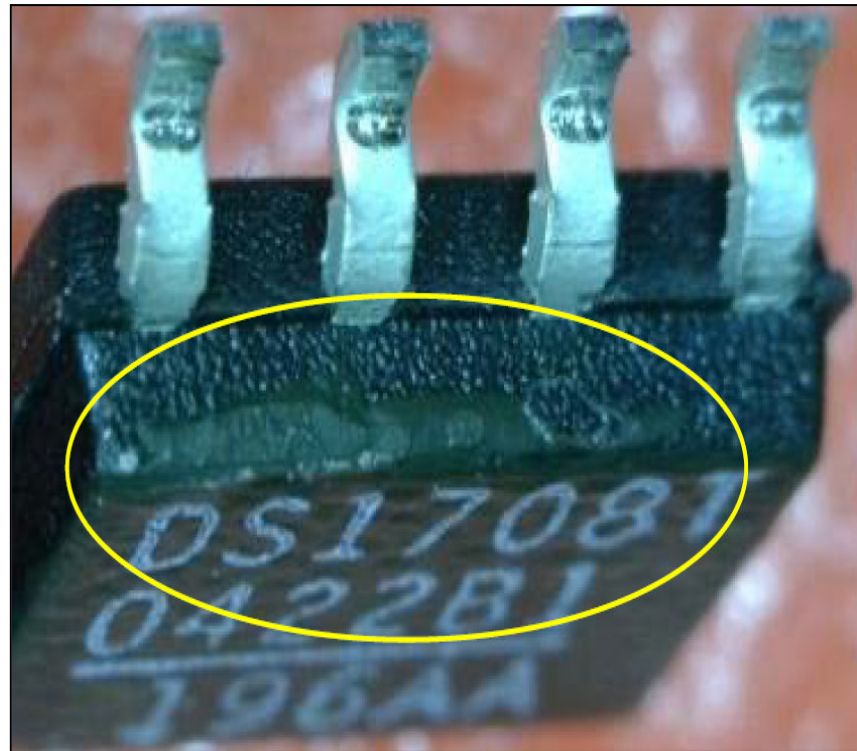
Validation Process: Example of Re-Marking

- **Sanding & painting the surface of the device is a common technique used by Counterfeiters to alter the marking or misrepresent the product.**

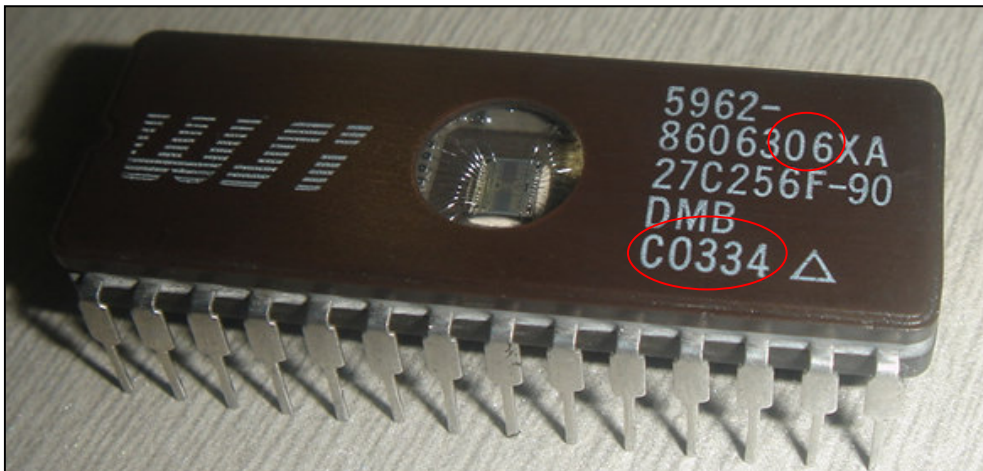


Validation Process: Example of Re-Marking

**Obvious
Indication of
Remarking Using
a Process Called
“Black Topping”**



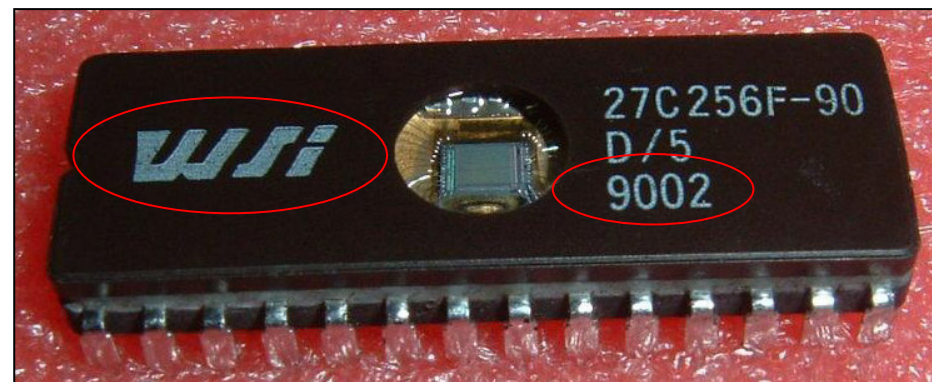
Validation Process: Example of Re-Marking



SMD P/N does not match the manufacturer's P/N (120ns vs 90ns) and the Date Code is two years past the EOL production date for this product.

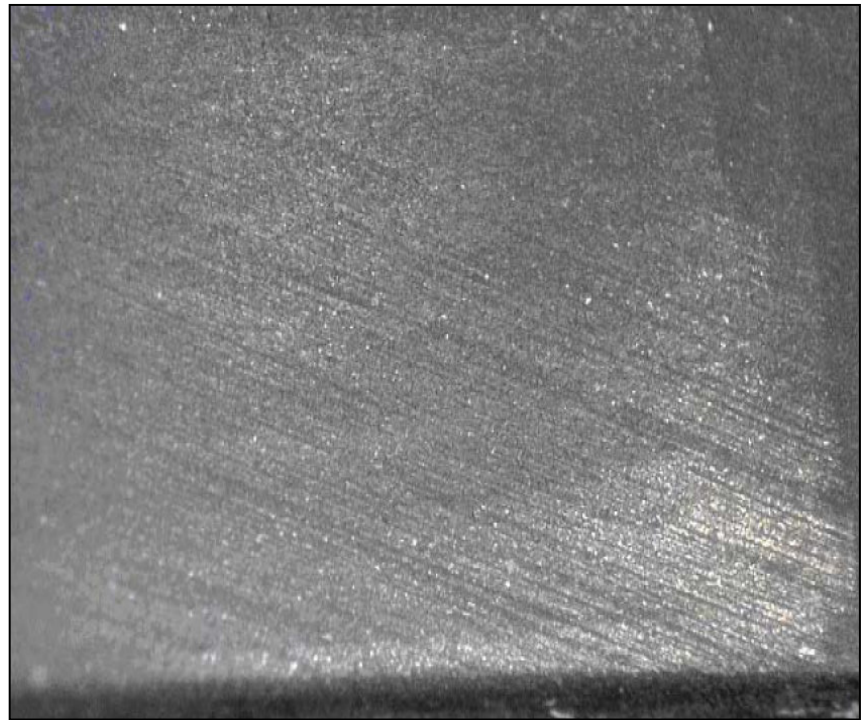
Validation Process: Example of Re-Marking

**Notice the
Difference in the
Logos? The
Date Code
Format? No
ESD Indicators?
Shiny Black
Finish....**



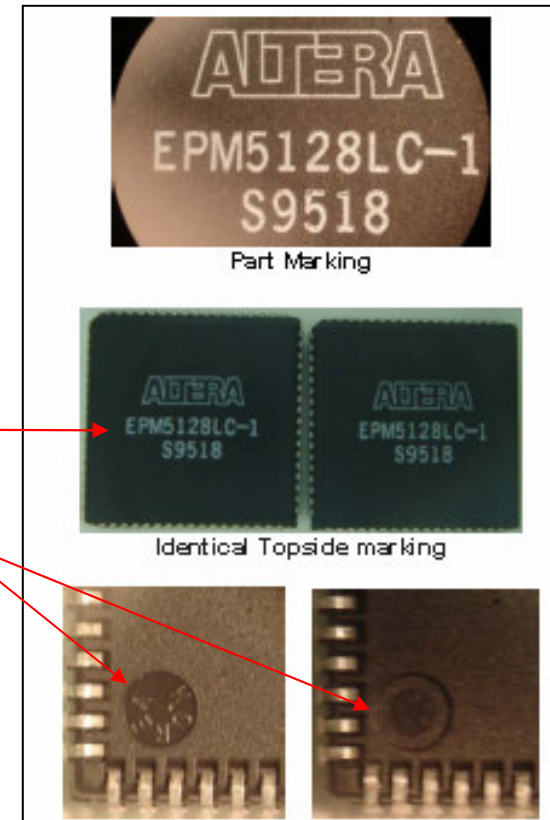
Validation Process: Example of Re-Marking

**High Magnification
Shows Abrasions
from Sanding found
Under Black
Topping**



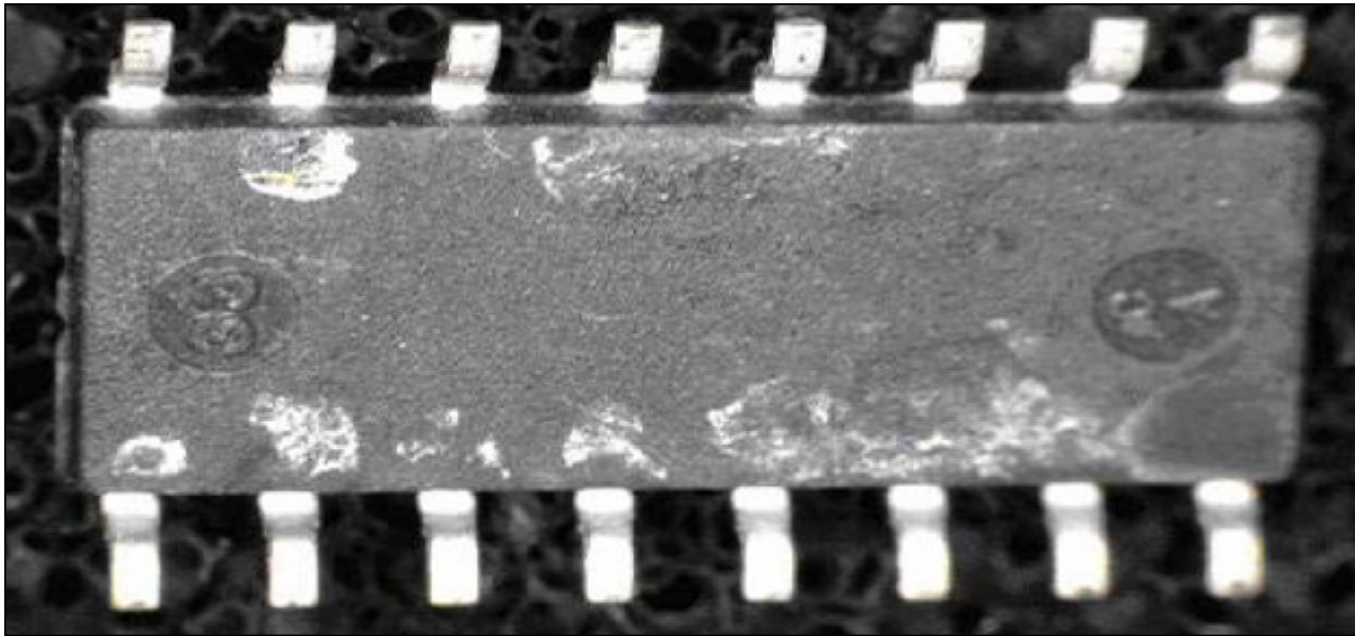
Validation Process: Example of Re-Marking

This Material has been re-marked and several lots of material combined into one. Notice that both products have the same lot number and product marking, but have two different packages styles.



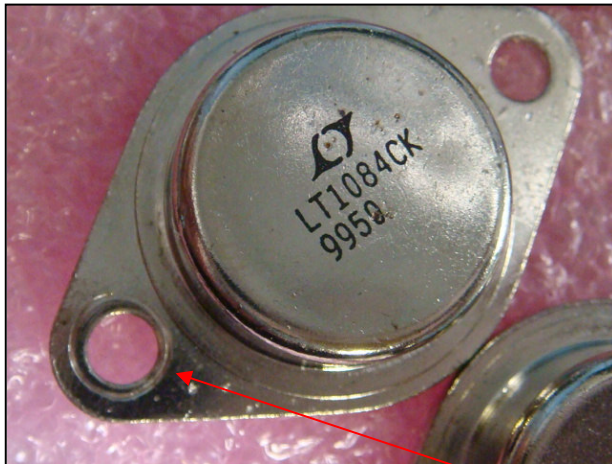
Validation Process: Example of Used Material

- **This type of Contamination Indicates that the Material may be Used or Pulled from a board**



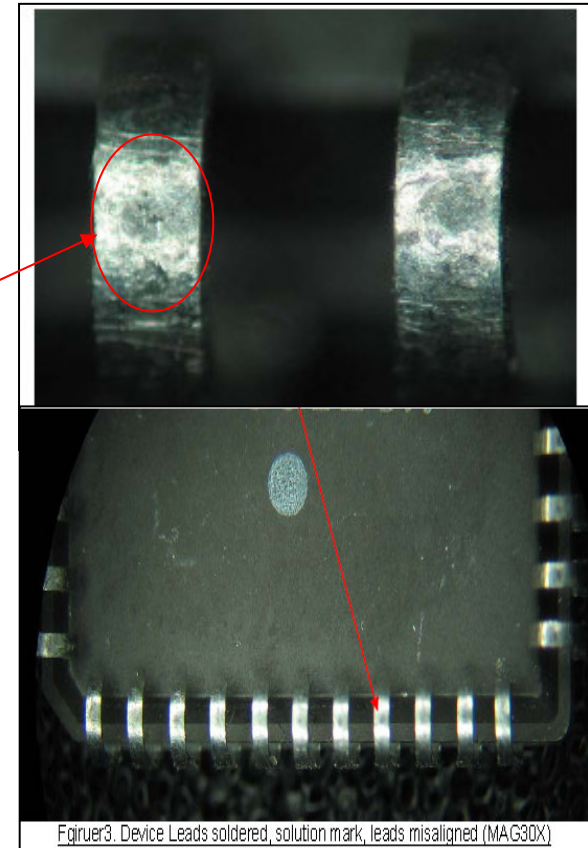
Validation Process: Example of Used Material

Visual indicators of material that has been used and refurbished.



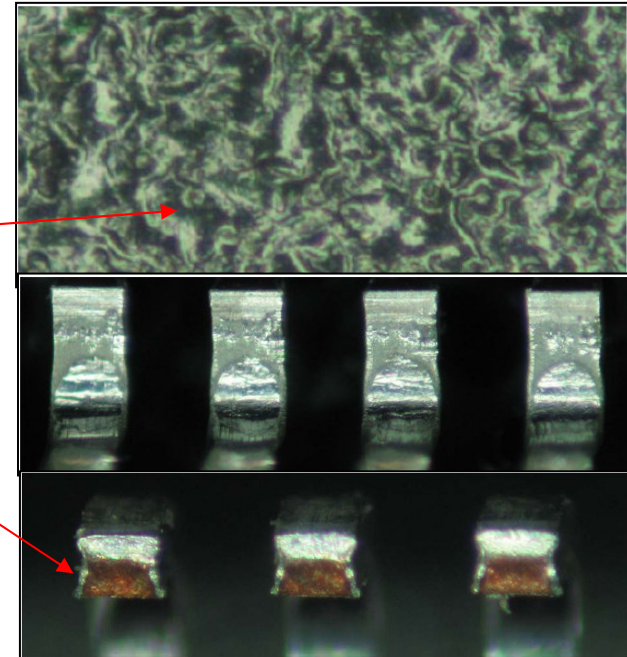
Scratches around Mounting holes

PCB Solder Marks



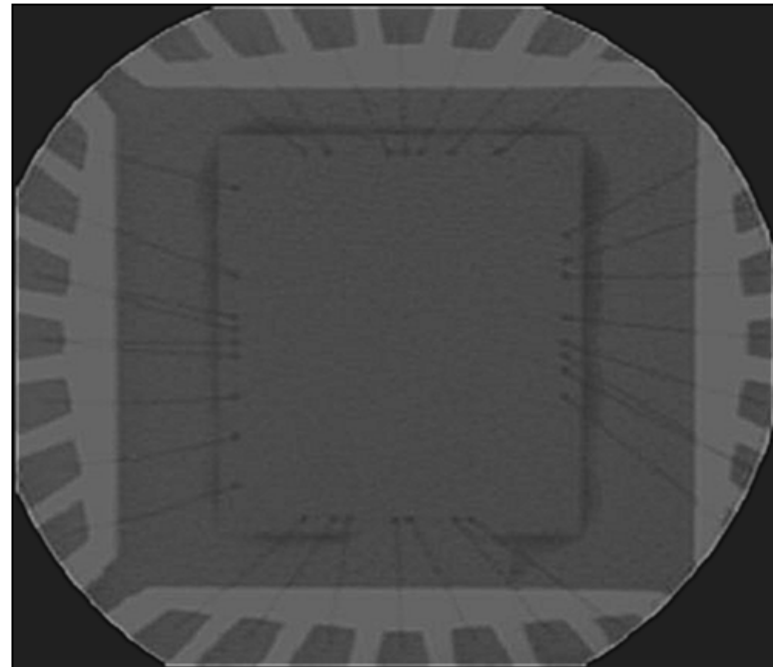
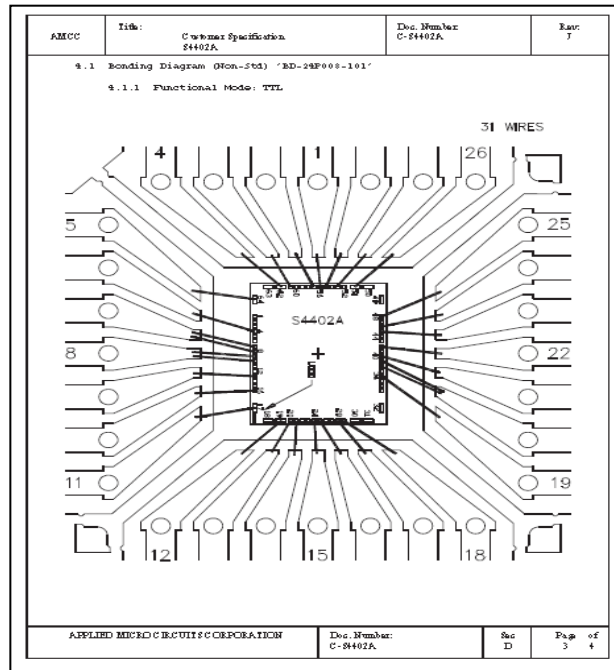
Validation Process: Example of NEW Material

We analyze the component surface and leads to look for evidence of the device being re-surfaced or re-tinned.



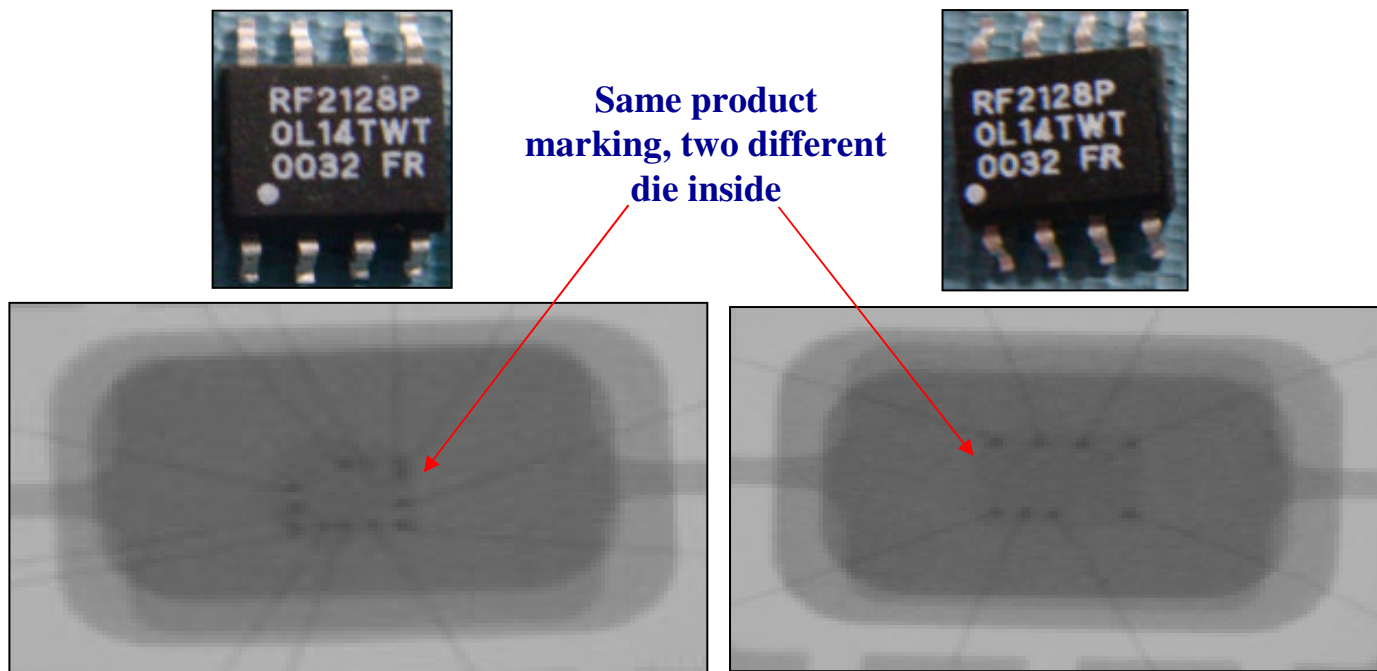
Validation Process: Benefits to Using of X-Ray

X-Ray Can Be Used to Validate Lot Consistency and is a Non-Destructive Test



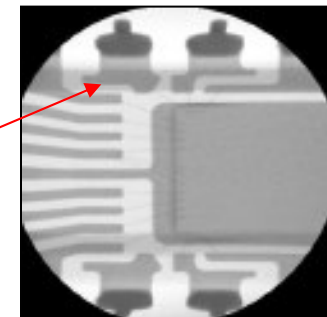
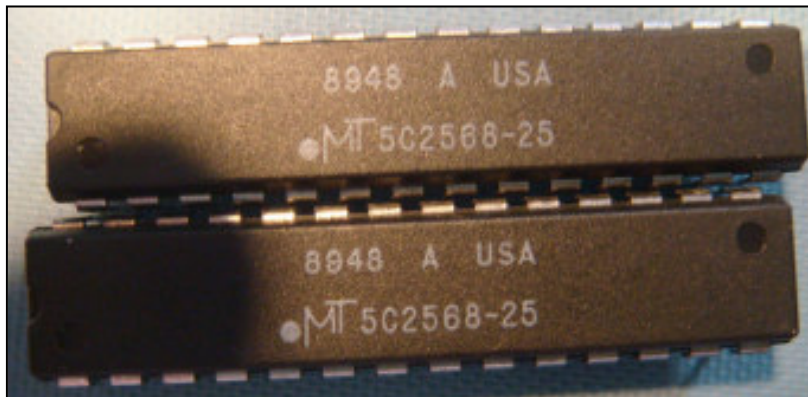
Validation Process

X-Ray can be used to identify counterfeit material in a lot of mixed material

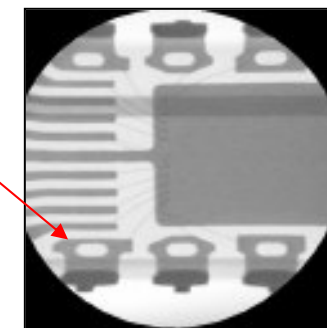


Validation Process: Uses for X-Ray

Using X-Ray we were able to detect two different die types and lead frames used in the same lot of material. Upon further investigation we also identified two different die revisions.



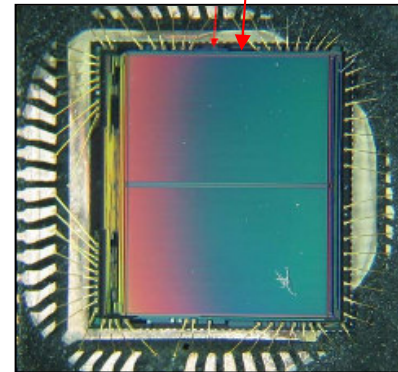
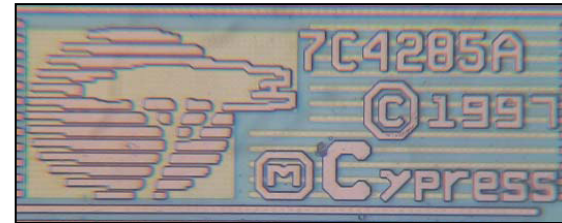
**Micron
S06A
Revision**



**Micron
S12D
Revision**

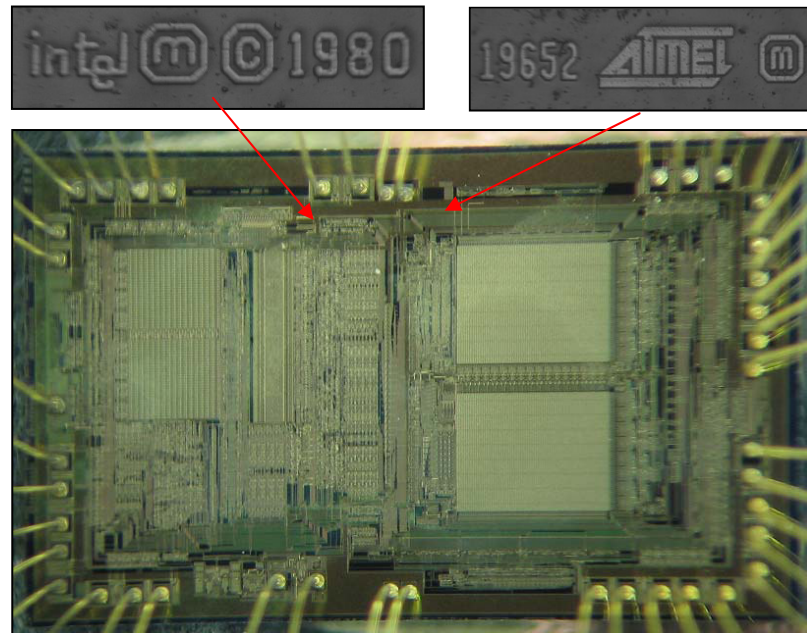
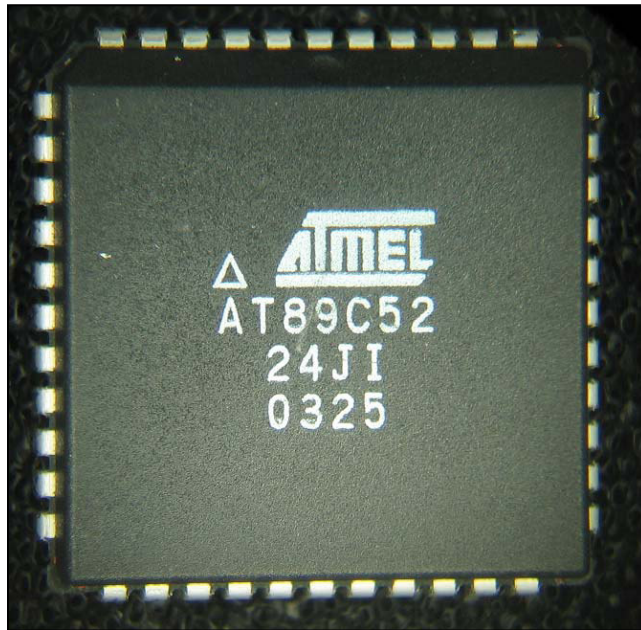
Validation Process: Example of Die Identification

Validation of the Mask and Die ID is key to determining the authenticity of a device.



Validation Process: Example of Die Identification

This information is validated on every lot of
XTREME “**Certified EOL Product**”.



XTREME
Semiconductor



Certified EOL Product

- What you can expect from ***XTREME*** Semiconductor
“Certified EOL Product” ?
 - Original OCM Material, no Counterfeits
 - Certificate of Compliance (C of C)
 - Test Data: Die Photos, X-Ray's, Elect. Test Summary
 - Warranty: One-Year from the Date of Shipment
 - 100% Satisfaction



The logo for XTREME Semiconductor. It features the word "XTREME" in a large, bold, blue, italicized sans-serif font. A horizontal blue bar with a gradient and a small square pattern on the left extends from the top of the 'X'. Below "XTREME", the word "Semiconductor" is written in a smaller, bold, black, italicized sans-serif font.

XTREME

Semiconductor

“Certified EOL Product”
Eliminates the Risk



Let Us Put Your Mind At Ease....

