Avoiding Counterfeit Components

2011 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
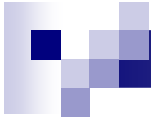
Who is XTREME Semiconductor?

- 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?**

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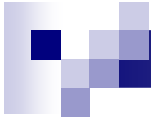
Avoiding Counterfeit Components

- **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**

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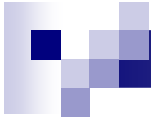# Avoiding Counterfeit Components

- **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**

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Avoiding Counterfeit Components

- Reported Counterfeit Incidents: 2005-2008
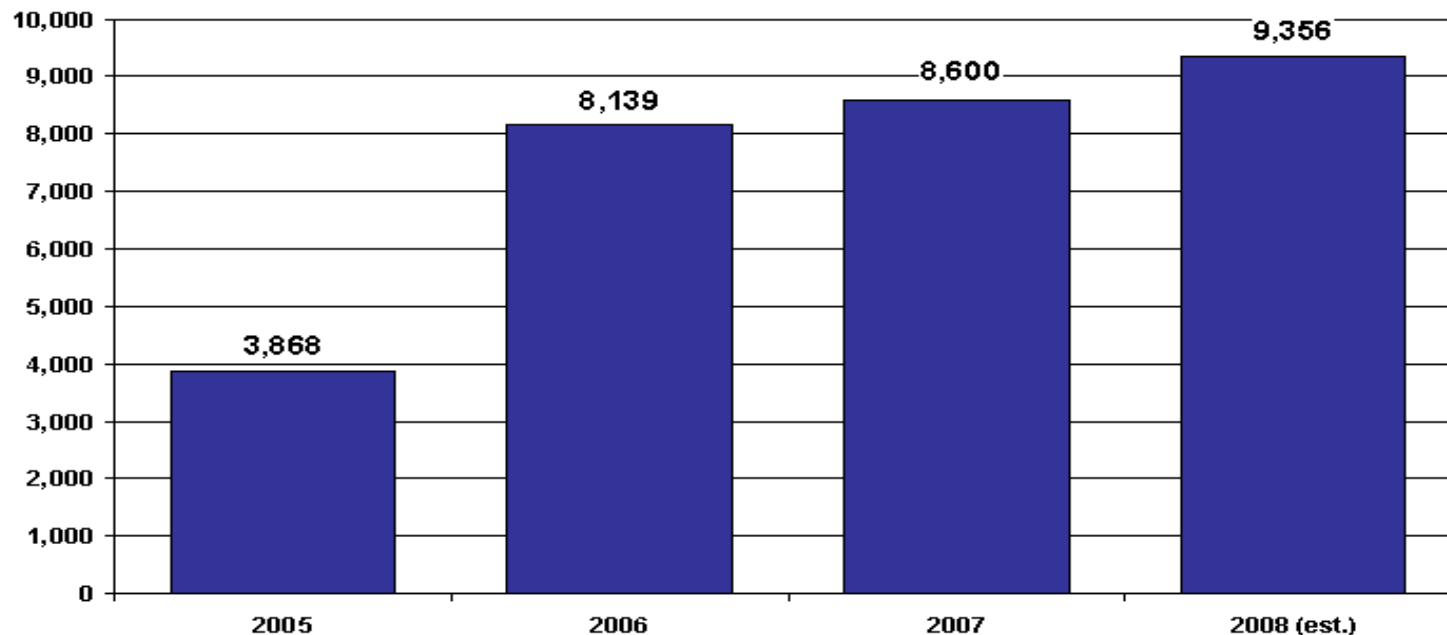
U.S. Department of Commerce – Preliminary Data (as of March 4, 2009)

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Avoiding Counterfeit Components

- **How Do You Avoid Getting Stung by Counterfeit Components?**
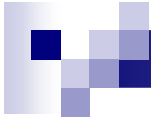
Avoiding Counterfeit Components

- **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

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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

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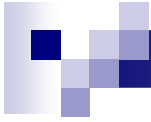
# Avoiding Counterfeit Components

- **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 <u>More</u> Support, Not <u>Less</u>**

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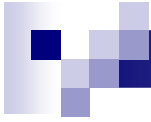
Avoiding Counterfeit Components

- **What is the "*True Cost*" of Receiving a Counterfeit Product? Some of the Cost to Consider are:**

  - Administrative Resources Cost to Purchase and Process Returns
  - Incoming Inspection
  - Problem Solving and Disposition
  - Processing Multiple Purchase Orders to Replace Material
  - Lost Production Time and Revenue
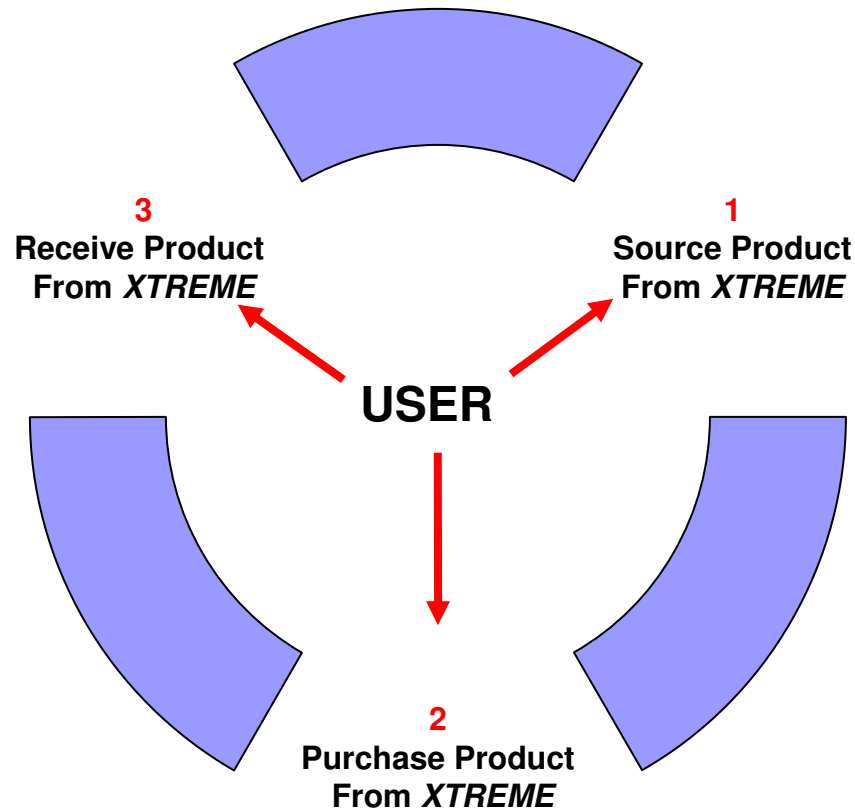 - Damage to Companies Quality Reputation

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Industry Solution – Current Model
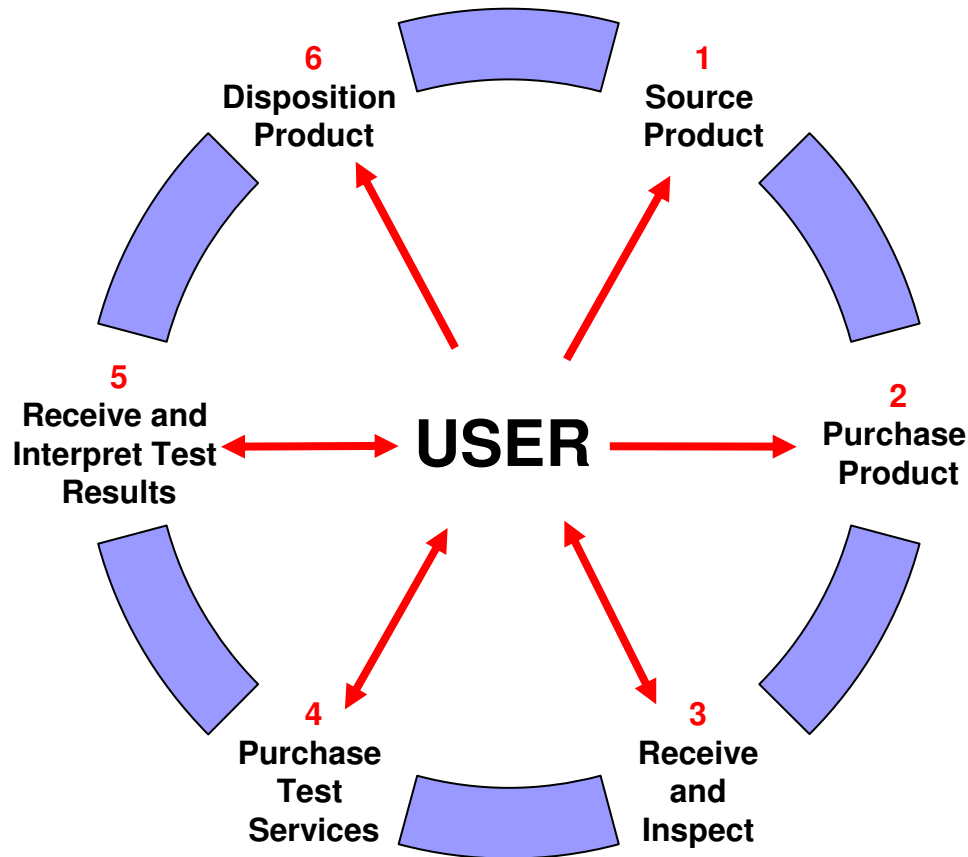
Consumes Valuable Resources

- **Resources & Time to Source Material**
- **Admin Time to Purchase Material**
- **Production & Quality Time to Inspect**
- **Resources & Time to Source Test Services**
- **Engineering and Quality Time to Inspect**
- **Engineering and Quality Time to Disposition**
- **Counterfeit Lot?...Process Starts Over Again**

Diagram labels:
- 6 Disposition Product
- 1 Source Product
- 5 Receive and Interpret Test Results
- USER
- 2 Purchase Product
- 4 Purchase Test Services
- 3 Receive and Inspect

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XTREME Solution - Value Proposition

3
Receive Product
From *XTREME*

1
Source Product
From *XTREME*

USER

2
Purchase Product
From *XTREME*

XTREME *Certified EOL Product*

- **Reduces Time and Resources for Sourcing**

- **Reduces Procurement Costs**

- **Reduces Engineering and Quality Time**

- **Provides One Year Product Warranty**

- **Provides Fully Documented Data Package**

- **Increased Company Productivity**

- **Better Value and Cost Savings**

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XTREME Solution

- ***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**

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XTREME Solution

- **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**

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XTREME Solution

- *"Certified EOL Product"* Inspection Results: 2008-11
  - 30-35% of all lots inspected by *XTREME* were rejected
    - Includes bent leads, damaged or Incorrect material
  - Ninety-eight (98) lots/devices types were rejected as Counterfeit or Suspect Counterfeit material.
  - 15-20% of lots presented to *XTREME* from Brokers are rejected <u>prior</u> to purchase. Rejection criteria:
    - Visual Anomalies
    - Lot Date Code Issues
    - Refurbished or Poor Condition

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Validation Process: Example of Re-Marking

- Sanding & painting or "black topping" the surface of the device is a common technique used by Counterfeiters to alter the marking or misrepresent the product.
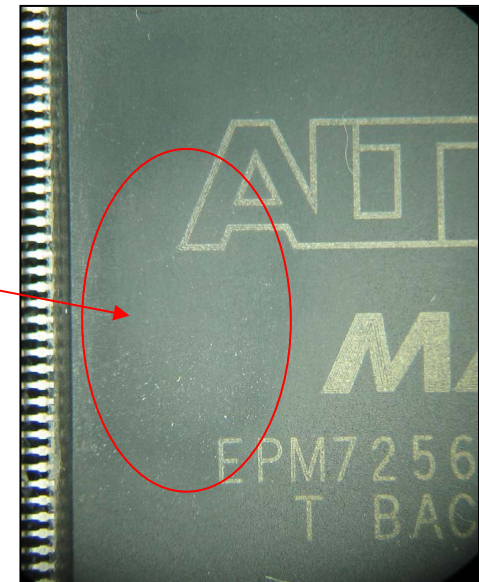
Validation Process: *Example of Re-Marking*

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

XTREME *Semiconductor*
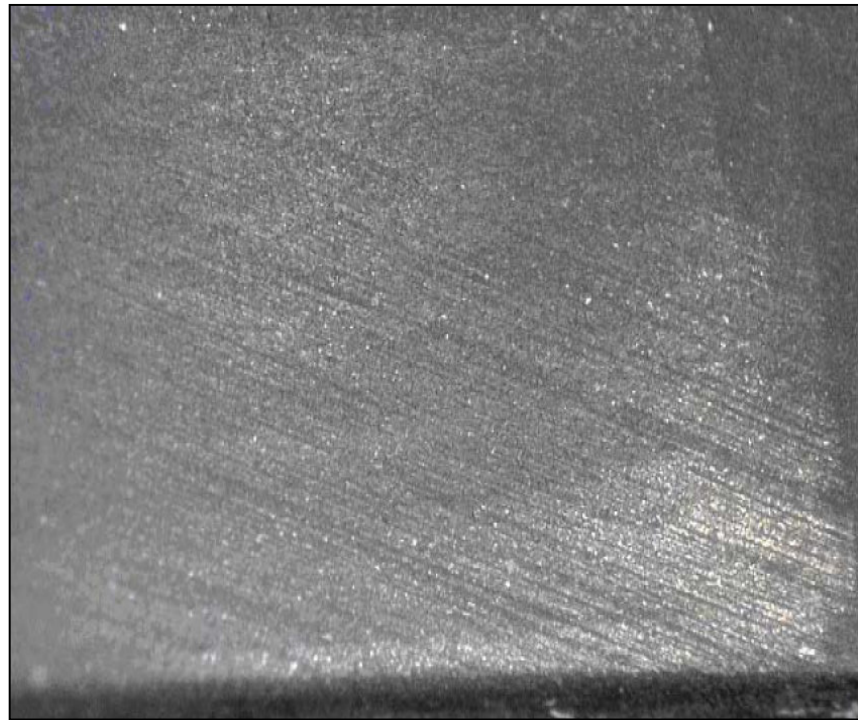
Validation Process: *Example of Re-Marking*

- **Military Grade Counterfeit Components**

Authentic

Counterfeit
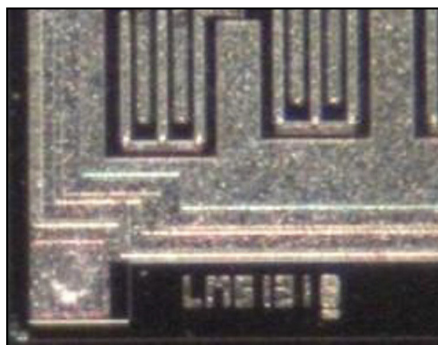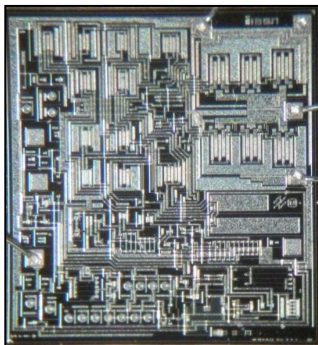
XTREME Semiconductor
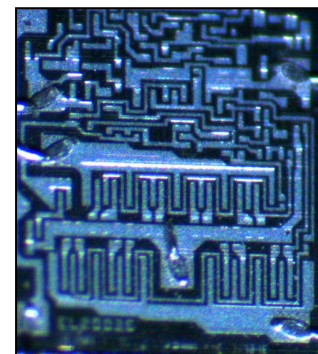
Validation Process: *Example of Re-Marking*

- **Mixed Material, Multiple Die and Packages**
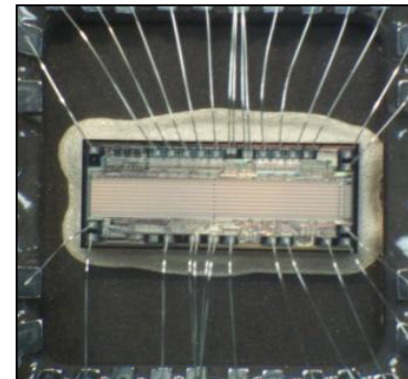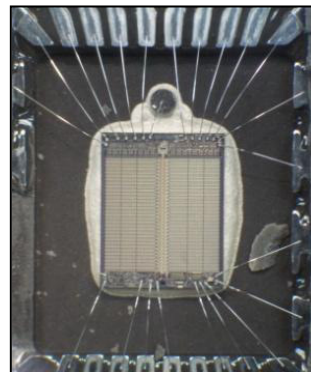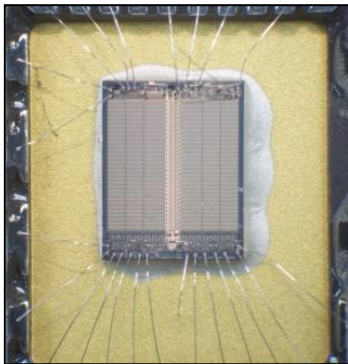
Validation Process: *Example of Re-Marking*

Authentic Xicor Product
X20C04 CMOS Die
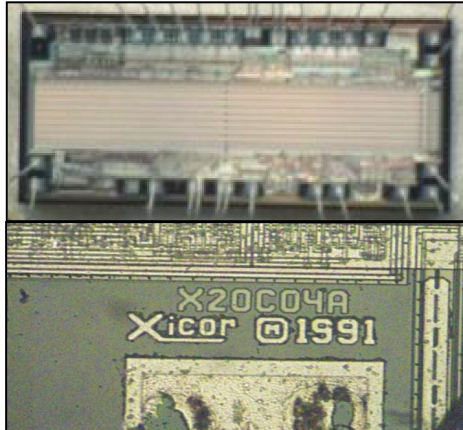
Counterfeit Xicor Product
X2004 MOS Die
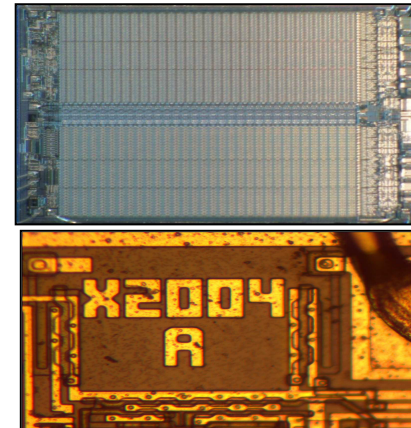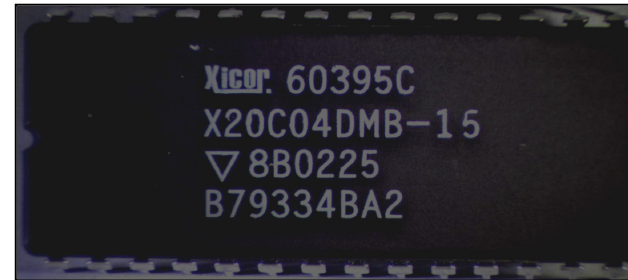
Validation Process: *Example of Re-Marking*

**Obvious Indication
of Remarking Using
a Process Called
"Black Topping"**
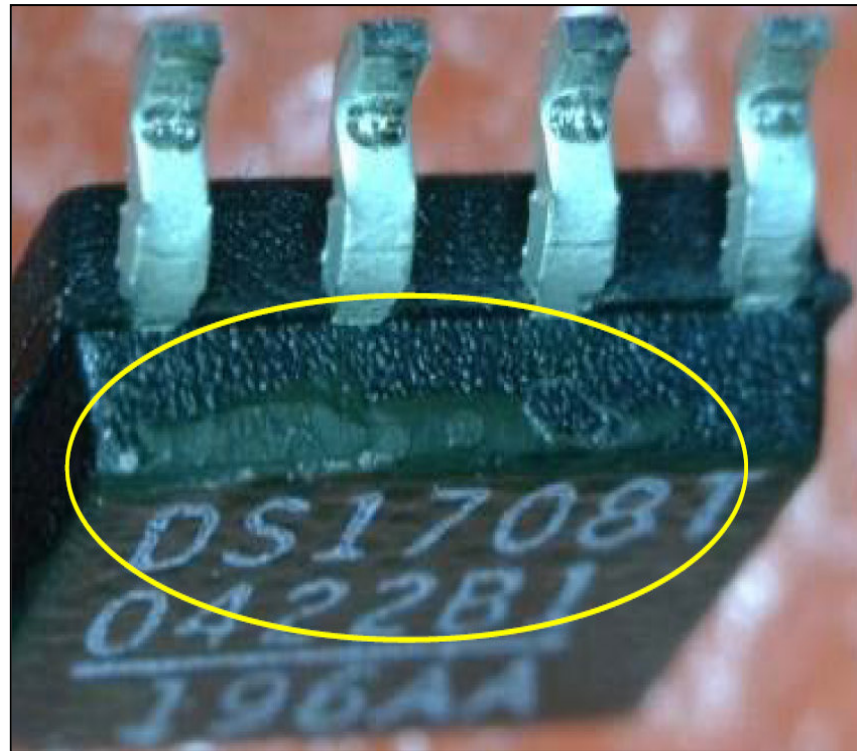
Validation Process: *Example of Re-Marking*

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.

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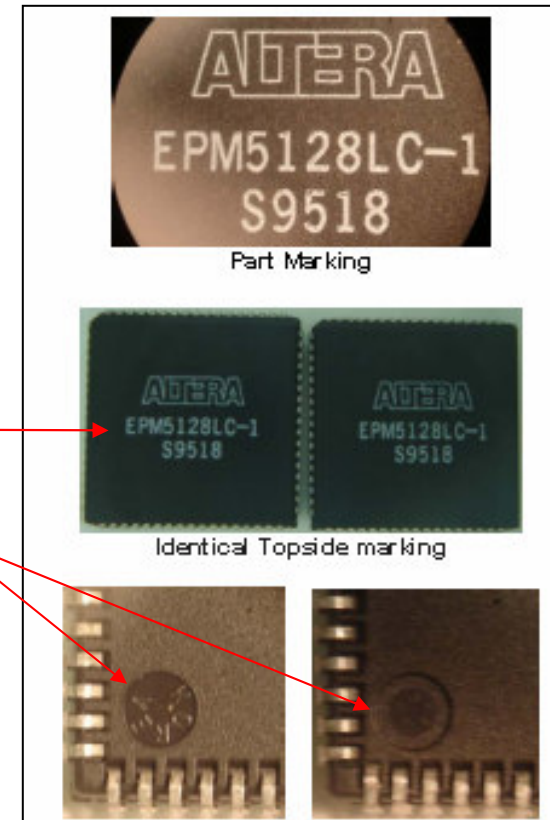
Validation Process: **Example of Used Material**

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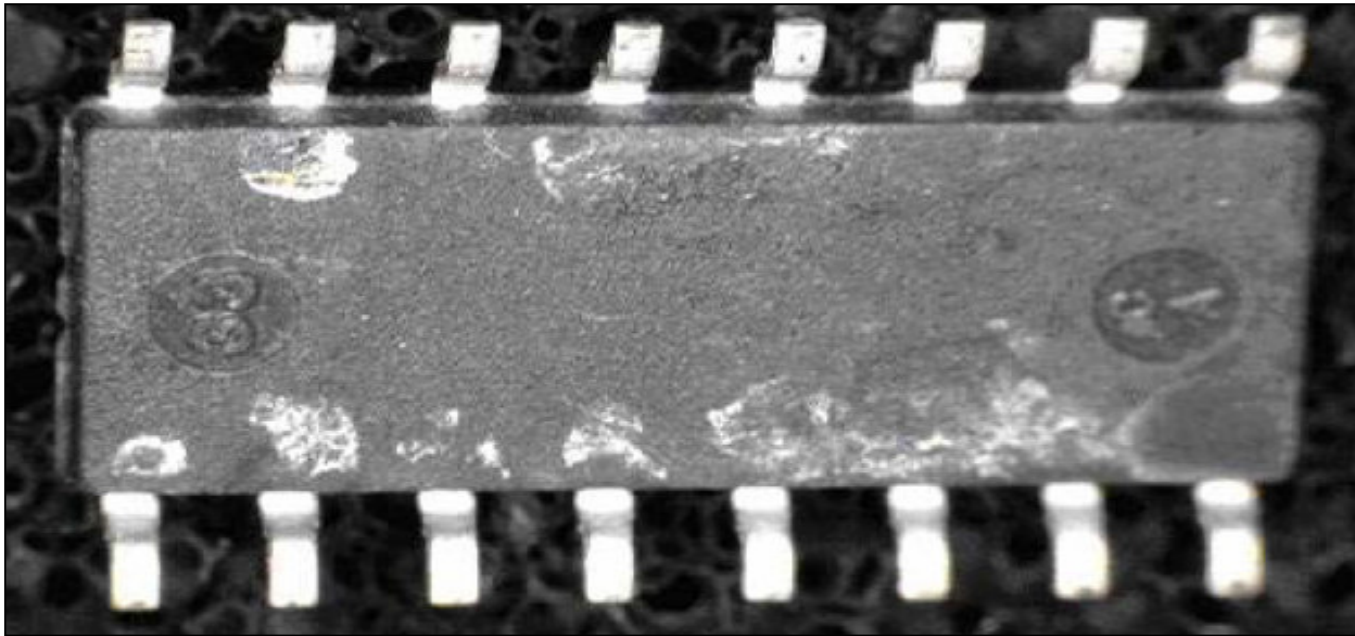
Validation Process: *Example of Used Material*

**Visual indicators of material that has been used and refurbished.**
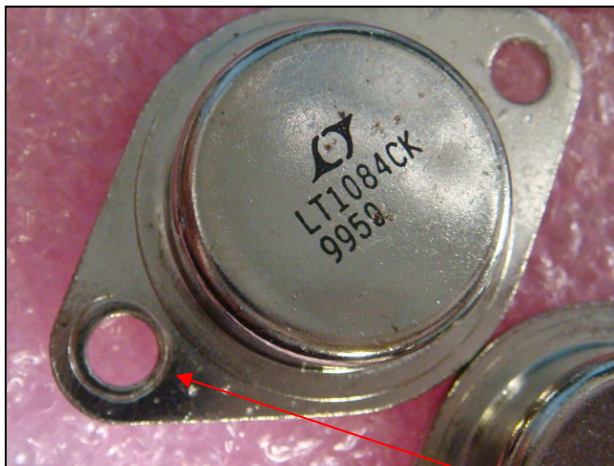
PCB Solder Marks

Scratches around Mounting holes

Fgiruer3. Device Leads soldered, solution mark, leads misaligned (MAG30X)
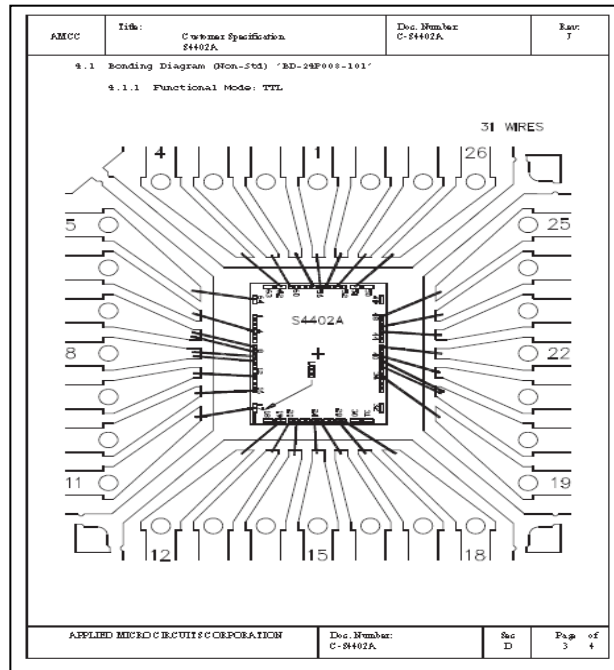
XTREME *Semiconductor*
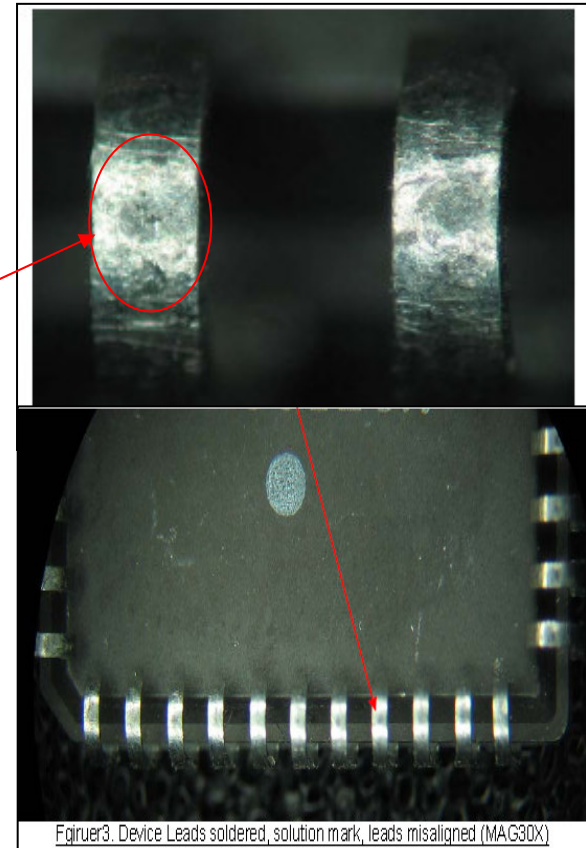
Validation Process: *Example of <u>NEW</u> Material*

We analyze the component surface and leads to look for evidence of the device being re-surfaced or re-tinned.
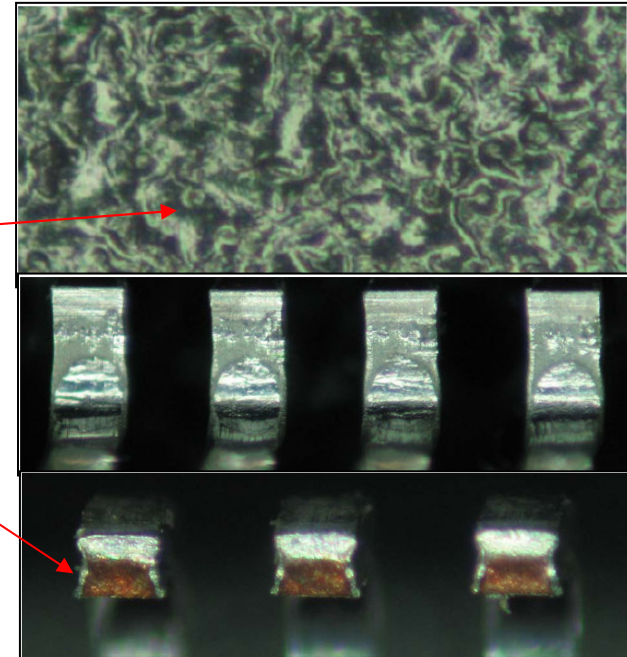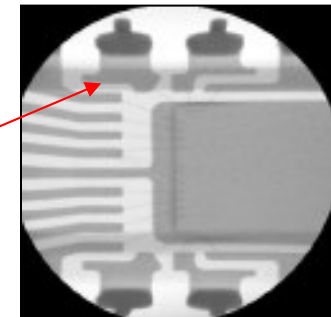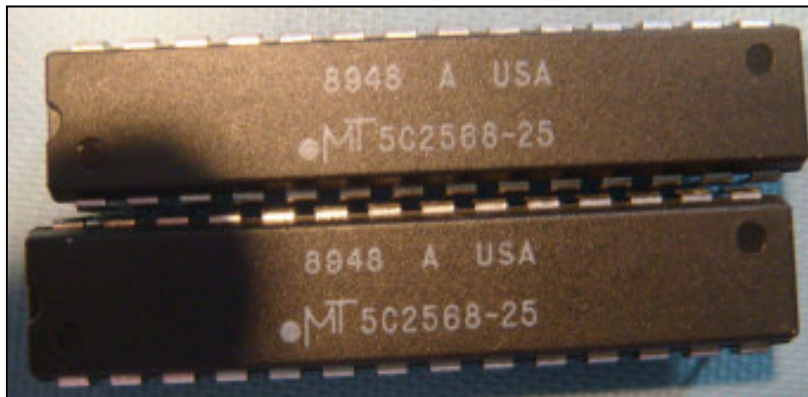
Validation Process: Uses for X-Ray

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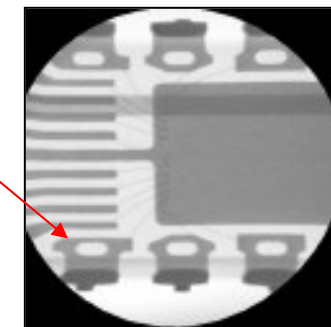

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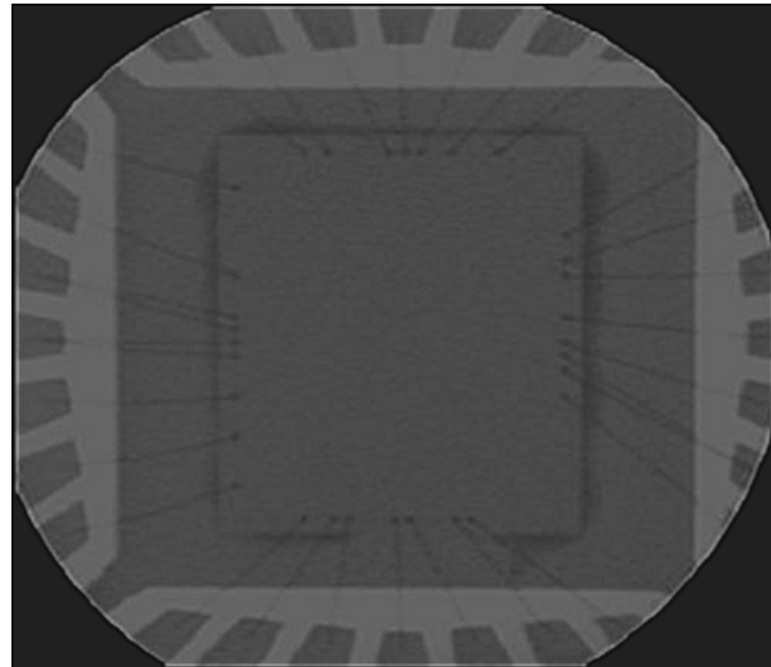
Validation Process: *Uses for X-Ray*

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.
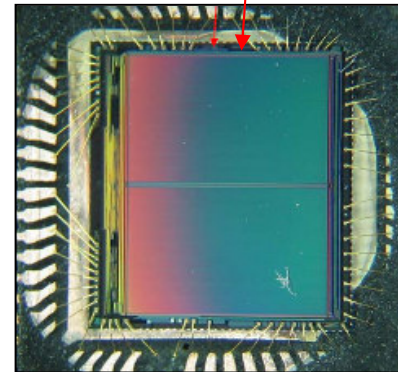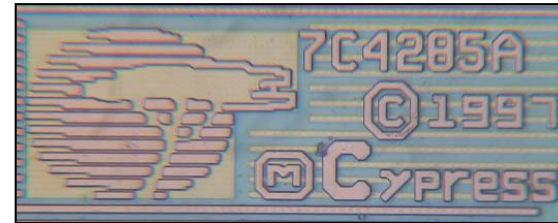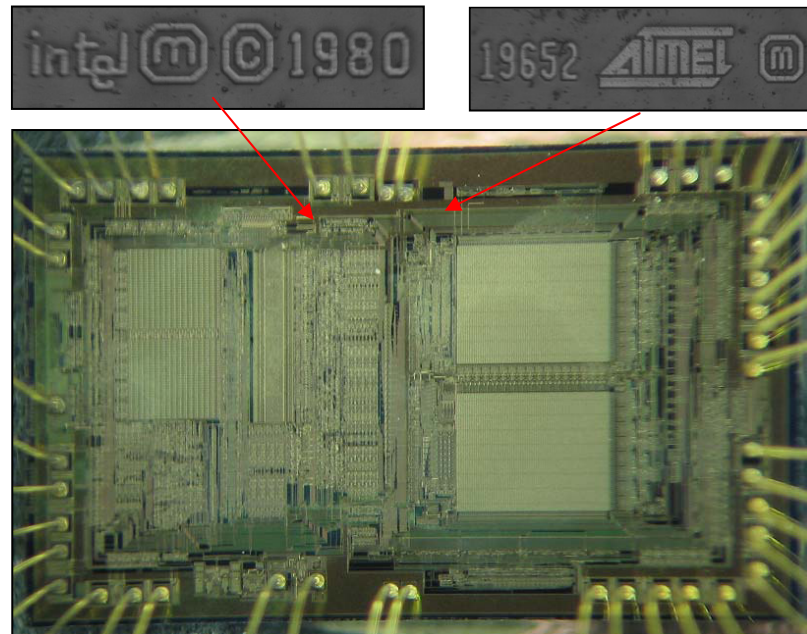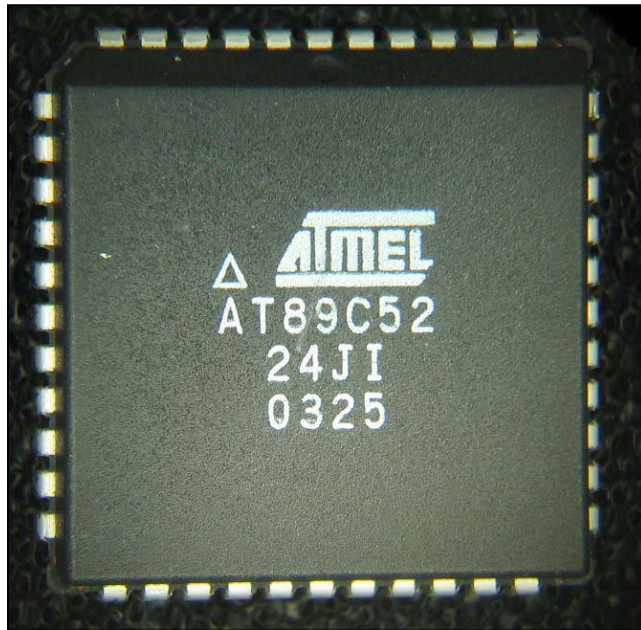

Micron
S06A
Revision

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".

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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

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"Certified EOL Product"

Eliminates the Risk

Let Us Put Your Mind At Ease….

erai AFFILIATE

QML DSCC CERTIFIED