



Are counterfeit components hiding in plain sight?



You bet your life, and maybe others', too. Faulty, false components that often pass initial tests are badly making their way into consumer products, medical products, even military products, threatening lives and livelihoods every day.



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## “Counterfeit Electronic Components

# ARE

Hiding In Plain Sight...”

Presented by:

**Adam Fletcher**  
Chairman



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## Speaker Profile.....

Adam Fletcher – Chairman

Fletcher has over 30 years experience in the semiconductor industry in Europe, USA and Japan. His experience includes ERP Systems, Sales Management, Strategic and Tactical Product Marketing, European Operational Management and Global Corporate Management.

He has established, developed and managed, large multi-disciplined teams, generating sales revenues of \$50M+pa. He has been directly involved with corporate acquisitions, disposals, HYB and IPO funding.



Over the last 25 years Adam has worked directly with the development of many leading emerging Semiconductor companies with particular emphasis on OEM customer focused, regional and global demand creation, sales and marketing communication programmes.

Adam's key skill is in developing creative solutions to complex business issues and implementing them successfully. Fletcher holds numerous business and finance qualifications



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## Counterfeit – Some Definitions...

- UK Dictionary Definitions...
  - "Something counterfeit is not genuine but has been made to look genuine to deceive people."
  - "An exact imitation of something valuable with the intention to defraud."
- UK Legal Definition... Intellectual Property Theft
  - "Wilful **Trademark** Infringement" (Hard)
  - "Wilful **Copyright** Infringement" (Soft)
- Primary and Secondary Markets...
  - **Primary** – "Infiltration of Counterfeit Goods into the Supply Network to be purchased without Knowledge..." (Components)
  - **Secondary** – "Counterfeit goods Purchased with the consumers knowledge and complicity..." (Rolex / DVD's)



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## Other Illegal Activities.....

- Device Remarketing
  - Different Speed Grade – 120ns to 80ns...
  - Improved Performance – LM741 to OP-07...
  - Improved Temperature Specification – Commercial to Automotive...
  - Re-branding – Samsung to Toshiba...
- Document Falsification
  - Forged Certificates of Conformance / Tracking Documents
- Packaging Copyright Infringement
- Pulls - Reuse of memory and other components...



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## Pulls and Reuse...



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## Examples... T0-3 Transistors




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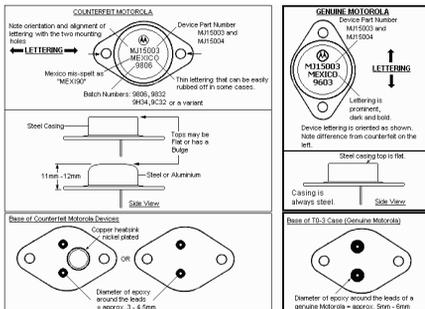
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Source: Rod Ebbett ESP <http://found.weathost.com/counterfeit.htm>  
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## Examples... T0-3 Transistors




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Source: Rod Ebbett ESP <http://found.weathost.com/counterfeit.htm>  
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## Examples... Circuit Breakers




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## An Increasing Problem.....

- In 2005 (OECD) study estimated that:
  - The international trade in counterfeit goods was \$200Bn...
  - If EU produced goods and internet transactions are included "it could well be several hundred billion dollars more..."
- \$200Bn is larger than the economies of many developing countries...
- US Customs Crackdown in Anchorage discovered \$70M of counterfeit electronic components in one year...
- Over the next 5 years I suggest that Counterfeiting may become the **number 1** electronic component industry issue...



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## Where are Counterfeit Goods made???

Seizures of imported counterfeit and pirated products from the top 20 source economies

Region of top 20 source economies	Number of source economies in region	Seizures (% of total)
Asia (excl. Middle East)	12	69.7
Middle East	2	4.1
Africa	2	1.8
Europe	2	1.7
North America	1	1.1
South America	1	0.8
<b>Top sources</b>	<b>20</b>	<b>79.2</b>

The seizure percentages are based on trade-weighted data from 19 reporting economies.

Source: OECD 2007



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## Counterfeit Electronic Components Everywhere...

- All electronic components products are impacted...
- Some products more than others...
- A few will fail in safety critical systems...
- A few will disrupt secure systems...
- More will cause electronic equipment to fail early...
- Many will operate effectively for the equipments working life...
- All represent a potential threat to the IP holder...
- All undermine the IP holders revenue and profitability...



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## Counterfeit Demand or Supply?

### What Comes First?

- Demand - Organisations Keep Buying Them...

or

- Supply – Survival / Greed – Make Lots of \$\$\$\$...



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### What's Driving Demand?

- It's NOT
  - Lowest Price...
  - Fear of Counterfeit Products...
- It's Sometimes
  - Long Lead-Times...
  - Poor Availability...
  - LTB / Obsolescence...
- It's Often
  - Unexpected Customer Orders...
  - Poor Internal Planning...
  - Masochistic Purchasing...
    - Desperation sometimes overrules common sense...



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### It's Too Often Poor Production Planning...

- Identify Problems Early...
  - BOM Risk Assessment / Monitor Lead Times
- Work with Partnership Suppliers...
  - Diligent Progress Chasing Yields Results
- Invest in Inventory...
  - A Modest Investment in Inventory Mitigates Risk...
- Reschedule Your Production & Customer Delivery Dates
  - It's Not the End of the World...
- Don't Let Desperation Overrule Common Sense...
- Having Counterfeit Components Inside Your Products is Too Expensive Both Financially and in Lost Goodwill...



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## Overcoming Availability Issues...

- Extended Lead Times from Manufacturer: 16-26 weeks+...
  - *Plan for Production... Monitor Market Activity... Invest in Inventory... Commit Early... BOM Risk Assessment...*
- Limited Supplier Base...
  - *Work with Preferred Partners... Design for Lifetime... Migrate your Designs...*
- Product Obsolescence...
  - *Action LTB Notifications... Locate Alternative Sources... Redesign... Seek Innovative Solutions... Invest in Obsolescence Management...*



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## Low Volume / Batch Build Counterfeiter's (Military / Aerospace)

- Counterfeiting "Cottage Industry"...
  - Low Technology...
  - Reuse of Components...
  - Complex Documentation Trail...
  - High Margin...
  - Focus on Very Specific Needs / Niches...
  - Disappear / Resurface Quickly...



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## US DOD...

- "Inquiry into Counterfeit Electronic Parts in the Department of Defence Supply Chain"
- A two year investigation into two military projects
  - 1,800 Counterfeit Parts
  - >1,000,000 Counterfeit electronic components
  - China is the dominant source...
  - 650 primarily US based un-authorized distributors supplied the counterfeit components...
  - US DOD didn't understand the scope and scale of the problem...
  - Routine gross under-reporting of counterfeit components...
  - Defence contractors recovering costs to fix the problem...
- Russian Phobos-Grant (Mars Mission) Failed....



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## 2012 National Defence Authorisation Act

- A legal requirement to detect and avoid counterfeit parts in the military supply chain”...
- Purchase only from the Manufacturer an Authorised Distributor or Approved Supplier....
- “Approved Supplier” is a Trojan Horse...
- Legitimising Un-Authorised Distributors???
- “Caveat Emptor” (Buyer Beware)...
- Strong Global Promotion of Authorised Distributors by IDEA members...



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## Mid / High Volume Counterfeiter's

- Professional Counterfeiting...
  - World Class Capability...
  - High Tech Equipment...
  - Highly Trained Manufacturing Personnel...
  - Low Margin...
  - Minimal Documentation...
  - Often 2<sup>nd</sup> or 3<sup>rd</sup> Tier Sub-Contractor...
  - Focus on ROI...
- Lack...
  - Economies of Scale... (Production, Logistics, Sales, Distribution...)
  - No Research or Development...
  - Little Innovation...



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## It can be Complicity...

- Taking Agreed or Approved Risk...
- Buying Outside the Approved Vendor Listing...
- Buying with Prior Knowledge...
- Buying from Disreputable Sources...



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## Why is Counterfeiting Increasing???

- Strong Demand...
  - Consumers - They don't care yet...
  - Industrial Users – Little interest yet... But they are "Waking Up"
- Weak Legislation...
  - Risk:Reward Ratio = Low Risk + High Reward...
  - Penalties for Counterfeiters are low...
  - China – 1:500 chance of successful legal action...
    - Improving, lawyers now specialising in IP...
- Cultural Issues
  - IP not recognised in China...
  - Pride in production of good counterfeit products...
  - Massively increased sophisticated production capacity...



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## Why is Counterfeiting Increasing???

- OEM's Outsourcing / Off Shoring Manufacture
  - Industrial Espionage...
    - New Products / Processes / Know-how Transferring Early...
  - Poor Management Control...
    - Process / Procedures...
      - Traceability – Inter-company Transfers...
      - Returns to Channel...
      - Reselling Components...
    - Complex Global Supply Networks...
    - Overrun Production...
    - Complicity...
  - Cost Reduction Pressure...



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## Why is Counterfeiting Increasing???

- Internet Commerce
  - Arms length transactions...
    - Anonymity / Flexibility / Size & Scope of Market / Deception...
- Environmental Legislation – RoHS / WEEE / REACH...
  - Product Rationalisation...
  - Shortages of Components...
- Frustration
  - Asian manufacturers cannot get orders, not on AVL...
- Accepted Business Practice



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## The Cost of Counterfeiting to an OEM

Example LM4051 (SOT-23) Failure of a Counterfeit Component purchased via internet broker...

- Device Unit Price = \$0.40 (\$0.05 > Authorised Distributor)
- Assembled PCB Assembly Fails Test = \$40.00
- System Integration PCB Fails Test = \$500
- System Fails at Customer Premises = \$1000 / \$2,500
- **100 defective counterfeit components = \$100K loss**
- The \$100K loss does not include...
  - Consequential Loss Liability...
  - Loss of Customer Goodwill / Reputation...



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## Examples... Voltage Reference



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## Examples... Voltage Reference



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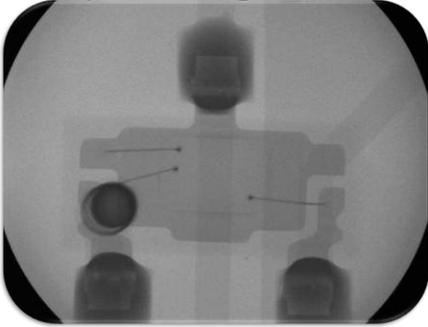
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### Examples... Voltage Reference



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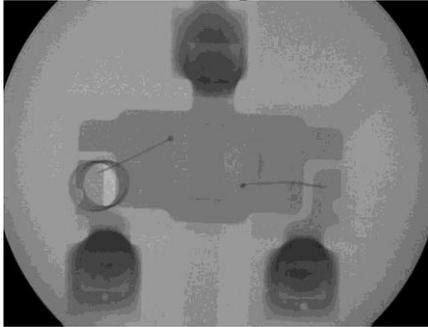
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### Examples... Voltage Reference



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### How To Avoid Counterfeit Components...



**This will not help!!**



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## What Can “The Industry” Do...

- There is no “Silver Bullet” to solve this problem...
- Brand Protection is a good first step...
  
- It is going to take long term sustained action across the electronic components industry by:
  - Governments...
  - Government Agencies...
  - OEM Customers...
  - Component Manufacturers...
  - Distributors...

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## What Can Component Manufacturers Do...

- Traceability...
  - Improve Control Documentation...
  - Only Ship and Accept Returns in Sealed Boxes...
    - Full QA screening of **all** restocked products...
  - RFID tags on Shipment Boxes and MSM to track movement...
  - Use of unique product identifiers – Serial Coding / E-Marking / Smart Water / Smart Packaging...
- Exercise greater control over their sub-contractors...
  - Greater Control of Production / Yields / Scrap Products...
  - Test and Pilot runs must be scrapped effectively...
- Actively Publicise and Notify Customers of Counterfeit Problems...

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## What Can Authorised Distributors Do...

- Maintain and Enhance Manufacturers Traceability...
- Disseminate Information Widely...
- Enhanced Flexibility – Smaller Reels / Lower MOQ...
- Physically Scrap Written Off Stock...
- Avoid supporting Customers Needs via Brokers...
- Industry Regulated Component Search Website
  - [www.eciaauthorized.com](http://www.eciaauthorized.com)
- ??? SAE Standards Document Number: AS6081???
- Promote Globally the benefits on Authorised Distributors...

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## What Should Governments Do...

- Enforce Existing Laws – Particularly Imported Goods...
- Significantly Increase Penalties to Offenders...
- Common Enforcement Approach with Trading Partners...
- Impose Sanctions on Supplying Countries...
- Raise Public Awareness of Threat...
- Encourage Industry Participation...
- Gather Reliable Up To Date Information by Sector...

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## What Can OEM Customer's Do...

- Plan Material Purchases In Advance...
- Locate Buffer Inventory with an Authorised Distributor...
- Control Shipment of Critical Devices to Sub-Contractors...
- Use Multiple Sub-Contractors – Not Turnkey...
- Purchase from the Manufacturer or Authorised Distributors...
- Desperation sometimes overrules common sense...
- If you have to go to unauthorised source...
  - If an offer sounds "too good to be true" it probably is...
  - Use a broker with an operation in your home country...
  - Obtain documentary evidence / photographs...
  - Pay only on receipt and inspection / test of goods...

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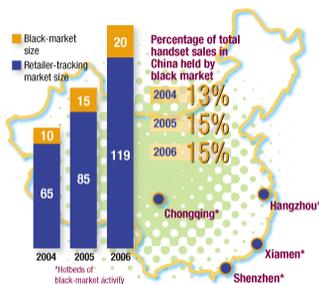
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## Counterfeit Cell Phones...




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### The Counterfeit Cell Phone...

- The new Apple iPhone is a classic example of counterfeit activity...
- Strong consumer demand has resulted in at least five clones...

<http://www.youtube.com/watch?v=m9skusj906Q>

- Thanks to Semiconductor Insights...

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### Thank You...

- Any Questions?
- Adam Fletcher - adam@ecsn-uk.org

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### Sources of Additional Information...

- [www.ecsn-uk.org](http://www.ecsn-uk.org)
- [www.anticounterfeitingforum.org.uk](http://www.anticounterfeitingforum.org.uk)
- [www.nedassoc.org](http://www.nedassoc.org)
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- [www.semiconductor.com](http://www.semiconductor.com)
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- [www.china-outlook.com](http://www.china-outlook.com)
- [www.iccwbo.org/bascap/id1127/index.html](http://www.iccwbo.org/bascap/id1127/index.html)

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