

What's Your PCB IQ?

Marissa Oskarsen & Chrysty Shea, Printed Circuit Girls and Geeks

Counterfeit Quiz 2

Do you know how to avoid and detect counterfeit electronic components? Take the PCB Girls & Geeks 10-question pop quiz to find out!

“An ounce of prevention is worth a pound of cure.” When electricity’s “discoverer” Ben Franklin coined that phrase he had no idea how applicable it would be to counterfeit electronic components! With so many fake parts in the supply chain, proper avoidance and detection strategies can save electronics manufacturers money, aggravation and - most notably – their butts.

Below are 5 statements on counterfeit component avoidance. Are they real or fake?

1. The only truly safe way to avoid counterfeit components is to purchase directly from the OCM's authorized distributors.
2. Independent distributors are the highest risk providers of counterfeit components.
3. When components go obsolete on legacy products, manufacturers have no choice but to purchase parts from unauthorized sources like brokers, internet sites or independent distributors.
4. “Known counterfeit” parts are listed in a database that you can query.
5. E-waste is the source of raw materials for many counterfeiters. To prevent your old electronics from becoming someone else’s new problem, you can check online to make sure your recycler is properly dispositioning your e-waste.

Below are 5 statements on counterfeit component detection. Are they real or fake?

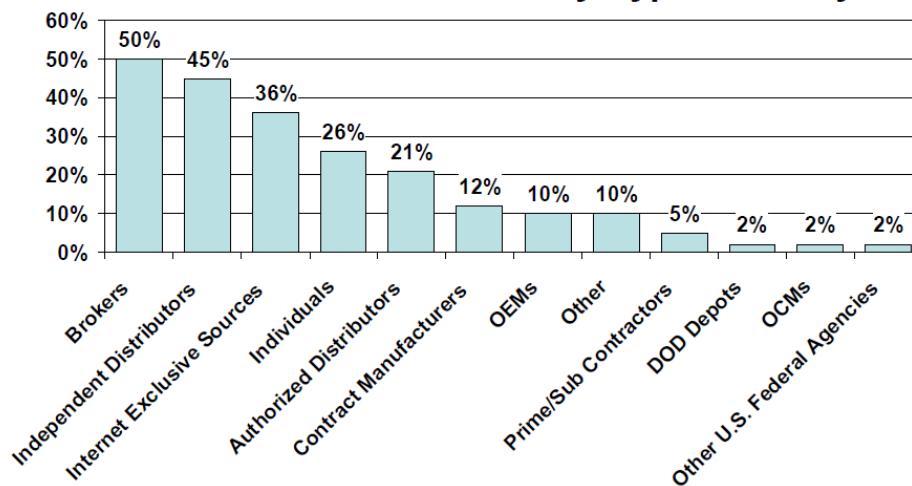
6. All component suppliers should have detection methods.
7. Most counterfeits are easy to spot by visual inspection.
8. Counterfeit parts will fail at electrical test.
9. X-ray is a common inspection method to identify counterfeits.

10. The latest information on the component counterfeiting issues, avoidance and detection will become available at the end of June, 2012.

Answers:

1. **Fake.** According to the US Department of Commerce, there is no absolute “safe source” for electronic components. Over 20% of the OCMs surveyed reported counterfeit incidents with Authorized Distributors. The chart below was taken from the U.S. Defense Industrial Base Assessment, Counterfeit Electronics, January 2010. (http://www.bis.doc.gov/defenseindustrialbaseprograms/osies/defmarketresearchrpts/financial_counterfeit_electronics_report.pdf)

Figure II-12: Percent of OCMs with Cases of Counterfeit Incidents Sold by Type of Entity*



* Only includes companies who encountered counterfeits

Source: U.S. Department of Commerce, Office of Technology Evaluation, Counterfeit Electronics Survey, November 2009.

2. **Fake.** As seen in the chart in answer 1, component brokers are the highest risk source of counterfeits. As for independent distributors, not all are created equal. Dawn Gluskin, founder and CEO of SolTec Electronics, advises “There are plenty of reputable independents out there that should not be dumped into the same category as the ‘bad guys’ who knowingly sell counterfeit parts, or simply lack the...due diligence when procuring components.” SolTec specializes in sourcing obsolete, long lead time, or hard-to-find parts, and uses a state-of-the-art internal testing program to certify that every component they supply is genuine. To help buyers distinguish good distributors from shady ones, Gluskin offers these 10 Tips (http://www.ebnonline.com/author.asp?section_id=1270&doc_id=231518) for supplier selection.

3. **Fake.** When component obsolescence woes impact production, the initial reaction is usually to get components as quickly as possible, even if it means stepping outside the traditional supply chain.

First off, let's just say that this situation can often be prevented by regular BOM reviews and accurate forecasts. Unfortunately, we all tend to ignore our legacy products more than we should. We can't help it; we just get so busy thinking about our Next Big Thing!! Lots of organizations are facing obsolescence challenges these days, and there are solid alternatives to risky sources, so don't go flying off the handle and ordering a whole bunch of junk that might cause you even more problems.

Philip DiVita, Chief Technical Officer of the contract design and manufacturing firm DA-TECH Corporation, explains that there are a number of alternatives available when component obsolescence strikes: "Mitigation strategies include lifetime buys, alternate OCMs, minor redesign to accommodate substitute components, or complete redesign of the PCB." While respinning the PCB may sound like overkill, it can actually **save** money. Why? Less expensive PCBs, among other things! Depending on the age and lifespan of the product, redesigning it with modern SMT components will likely shrink the size and layer count of the board. DiVita offers this general rule of thumb. "If the product's current model will be produced for at least two more years, and has been in production for eight or more, redesigning the circuit board with modern PCB technology and components will not only pay for itself, it will also reduce overall product cost moving forward."

4. **Real.** ERAI and GIDEP both contain databases of known counterfeit parts. If you've received a part that you suspect, you can search to see if others have had issues with the same component. Also, if you've received counterfeits, you can enter the information into the database for others to reference. You don't have to be a member of one of these organizations to submit information; these valuable resources are available to everyone.
5. **Real.** The Basel Action Network (BAN), a non-profit organization that combats the exports of toxic waste to developing nations, certifies e-stewards for responsible recycling of electronic products. To find a BAN-certified e-steward near you, go to: <http://e-stewards.org/find-a-recycler/> and enter your zip code.
6. **Real.** That's right, ALL component suppliers should employ some counterfeit detection measures. Some suppliers will definitely have better programs than others, so their detection capabilities are going to vary, but one thing's for sure: If they have no detection methods at all, you do not want to buy anything from them. Not even empty foil bags or waffle trays.
7. **Fake.** Early counterfeits were easy to spot, but the newer ones aren't. The current sophistication levels of counterfeiters' sanding, "blacktopping," remarking (even with laser!) and lead re-pressing and re-tinning operations are absolutely amazing! The days of capturing counterfeits by dabbing a little solvent on the ink are long gone...

8. **Fake.** Some non-genuine parts may be similar in electrical design, earlier revisions of the same part, or falsely uprated for their performance environment. They'll pass electrical test and burn-in, but then they'll burn out in the field, burning you and your company's reputation in the process.
9. **Real.** Because counterfeit components often look just like the real McCoy's on the outside, it's a good idea to take a look at the inside. X-ray analysis can nondestructively image the die and wirebonds. While X-ray analysis can't say for sure if the part is genuine, it can instantly identify packages without die or with the wrong die. It's become such a popular detection method that reel-to-reel X-ray machines are now available to quickly check entire lots of parts. Other sophisticated, non-destructive tests gaining in popularity include confocal scanning acoustic microscopy (CSAM) to image the die and its attachment material to look for signs of delamination, which indicate the component has been recycled, and X-ray fluorescence (XRF) to compare package materials or inks of suspicious parts to known genuine samples.
10. **Real.** The **Counterfeit Electronic Parts and Electronic Supply Chain Symposium** will take place June 26-28, 2012, near Washington, DC. The technical conference and workshops are organized by the Surface Mount Technology Association (SMTA) and the University of Maryland's Center for Advanced Life Cycle Engineering (CALCE). Patti Hvidhyld (patti@smta.org), SMTA's Director of Education tells us that this will be the biggest counterfeit symposium yet: "We are very excited about this year's program. It's the strongest one we've ever had, with presenters from University of Maryland Law School, NASA JPL, US Department of Justice, University of Connecticut, BAE Systems, Silicon Cert Laboratories, World Micro, iNEMI and more. The three-day agenda incorporates perspectives from government, industry and academic institutions to address all aspects of the counterfeiting problems we face." For more information, go to <http://www.smta.org/counterfeit/>

SCORING

How good are your counterfeit detection skills? Give yourself one point for every correct answer and deduct one point for every incorrect answer, then compare yourself to these famous fictional detectives.

If you scored 8-10, you are a real-life Sherlock Holmes. You use your natural instincts, astute logical reasoning and top-notch forensic skills discern the good from the bad. Everyone in your office looks up to you and wants to be your Dr. Watson. And like the components you purchase, you are always 100% genuine! That's really cool by us, so please, never change! We think you're totally awesome.

If you scored 0-6, you are Inspector Clouseau. Just like the bumbling detective, you often have no idea what you're talking about, and are afraid of admitting there's something you don't know. Hasn't anyone told you that it's better to be silent and be thought a fool than to speak and remove all doubt? You're going to need to beef up your electronics knowledge if you want

to survive in this business. Keep taking the PCB IQ quizzes and develop a little bit of technosavvy, but please, please don't attempt conversations about counterfeit components just yet – unless you're talking about hiring a certified lab to perform your due diligence for you.

If you scored less than zero, we'll just call you Nancy. As in *Nancy Drew*, but since you drew the short straw when it comes to spotting counterfeits, we'll stick with just plain Nancy for now. You've been faking it from the moment you stepped into your office. Nice ruse, pretending to be a sophisticated buyer and pretending to take this quiz, but we're on to you! No worries though; we can help. Consider these quizzes "smart pills" that will improve your basic understanding of electronics design and manufacturing practices. Now please stop eating this quiz ("smart pill" is a just figure of speech, braniac) and get back to learning before the summer intern takes your job.