



SPOTLIGHT / SUPPLY CHAIN RISK

Is It Fake?

By Andrew “bunnie” Huang

*Editor’s Note: Andrew “bunnie” Huang is somewhat notorious in the world of gamers and tech geeks. Shortly after receiving his doctorate in electrical engineering from MIT in 2002, Huang gained fame for reverse engineering the original Xbox console. bunnie is a hacker in the purist sense of the word, he is a vocal and active proponent of open-source hardware and a long-term users’ rights advocate. Through his many forays into tech entrepreneurship, bunnie has gained first-hand experience in supply chain management and hardware manufacturing. Of his of his new book, **A Guide to Electronics in Shenzhen**, bunnie has said, “this is the book I wish I had when I first stepped foot into China a decade ago.” Taking a page from the “think like a hacker” handbook, SCN asked bunnie to share some of his practical insights on the challenges of identifying fake, substandard or remarked parts when sourcing components in China. The following is an excerpt of the chapter, “Is It Fake,” from bunnie’s new book. Keep in mind, bunnie is describing various scenarios that a buyer may encounter when sourcing in electronics markets in Shenzhen. His rating is strictly addressing the performance risk of each scenario. Neither he, nor SCN, are condoning any potential legal/contractual infringements.*

Here’s a list of potential scenarios to consider when evaluating a new or unfamiliar supplier. Bullets indicate the potential performance impact of each practice.

Component performance risk legend:

- **** serious impact
- *** likely serious impact
- ** likely no impact
- * little or no impact

* Sometimes components are genuine, but are partial lots not suitable for wholesale in Western markets, or may be short a few percent of the parts that it claims to have (so the reel might claim to contain 10,000 resistors, but actually has 9,900).

** Sometimes components are genuine, but have date codes over one or two years old. Because of strict inventory control policies in the largest manufacturers, these otherwise perfectly good components are sold as scrap.

* Sometimes components are genuine, but are remainders from a large production run that didn't use up all the parts that were ordered, and are thus sold as scrap.

*** Sometimes components are from "ghost shifts," where the exact production line that's used to make authorized product is run a bit longer to produce an extra lot (but perhaps without the same level of testing or quality control), which is then resold as brand-authorized product.

* (for jellybean parts) **** (everything else) Sometimes components are made by a local Chinese factory, but relabeled with the brand of more famous/reputable foreign manufacturers. This is particularly common on jellybean parts like resistors, capacitors and batteries, where the quality of the Chinese version is virtually indistinguishable from the foreign version. This is also done sometimes to offset import taxes or to pass tax audits.

* Sometimes sub-assemblies or modules that are made for brand-name products are sold directly by the sub-contractor, which means it's authentic quality and function, but the factory might (or might not) be in breach of contract with the brand.

**** Sometimes components are of a lower spec, but labeled as higher. This is particularly common in FLASH memory, batteries, or any product that features multiple grades in identical casing (e.g. phones with different internal storage capacities). I also suspect this



happens in capacitor and resistor tolerances and tempcos (temperature coefficient), but I haven't done a rigorous study to confirm the suspicion.

**** Sometimes components are rejects from a factory, but sold as full-spec. Sometimes they are also refurbished to a like-new state, but without the factory's authorization. These are tricky to catch.

**** Sometimes components are recycled and refurbished to be sold like new. This is particularly common among mobile phone parts and pieces. To combat the practice of "Frankensteining" devices, where several used or broken devices are gutted and the good parts combined into a "new" product, certain big-name smart phone makers have introduced component-level serial numbers and associated digital rights management (DRM) schemes.

*** Sometimes components are pre-production prototypes, but are being sold as production-grade parts. Keep an eye out for notices similar to "prototype not for sale" or "engineering sample" printed on the part.

**** Particularly in consumer goods, brands and trademarks are copied and put on items that clearly have nothing to do with the brand's authorized products. In many cases, this practice has an almost satirical effect and is extremely easy to spot. When aware of the practice, it's a (low impact) event; but if somehow the buyer is gullible enough to be fooled by the false trademark, it's definitely a bad deal.

**** Particularly in consumer goods, sometimes the packaging is fancy but the product is shoddily manufactured, lacks firmware QA/integration, or is not well-tested before shipping. You get what you pay for, caveat emptor.

* Sometimes everything is genuine and on the up-and-up, but the agreed upon price is different from the price actually transacted in cash. This is done typically to either avoid taxes or to create inflated invoices which are passed on for reimbursement, effectively improving the middleman's margin. This practice doesn't impact the quality of the goods, but the negotiated discount is typically not passed on to the ultimate consumer or the person issuing the reimbursement for the purchase.

*** Sometimes there are outright fakes, where someone has gone through the trouble of trying to copy the process, design, and firmware of a brand product and produce something that looks and functions exactly like the original but sells for less. But with so many other options, this is a lot of work for very little reward and thus is not as common.

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(shēn · zhèn)



Related Resources:

- Book Order: [The Essential Guide to Electronics in Shenzhen](https://www.crowdsupply.com/sutajio-kosagi/the-essential-guide-to-electronics-in-shenzhen)
(<https://www.crowdsupply.com/sutajio-kosagi/the-essential-guide-to-electronics-in-shenzhen>)
- Blog: [bunnie:studios](http://www.bunniestudios.com/blog/?p=4622) (<http://www.bunniestudios.com/blog/?p=4622>)
- Commentary: [Breaking the Counterfeit Code of Silence](http://transfal.tripod.com/imag/Falsificados.pdf)
(<http://transfal.tripod.com/imag/Falsificados.pdf>)
- Commentary: [What's the best defense against component counterfeiting?](https://www.ecnmag.com/article/2015/03/whats-best-defense-against-component-counterfeiting?)
(<https://www.ecnmag.com/article/2015/03/whats-best-defense-against-component-counterfeiting?>)
- Guide: [Counterfeit Parts Prevention Strategy Guide Product Overview](http://www.aerospace.org/wp-content/uploads/2015/04/TOR-2014-02161-Counterfeit-Parts-Prevention-Strategy-Guide-Product-Overview.pdf)
(<http://www.aerospace.org/wp-content/uploads/2015/04/TOR-2014-02161-Counterfeit-Parts-Prevention-Strategy-Guide-Product-Overview.pdf>)
- White Paper: [The Best Defense Is a Good Offense – Authorized Component Distributors Help Military/Aerospace OEMs Plan for Obsolescence](https://www.rocelec.com/media/uploads/documents/Avnet-The_Best_Defense.pdf)
(https://www.rocelec.com/media/uploads/documents/Avnet-The_Best_Defense.pdf)



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