First Byte Micro Limited – Combating Counterfeit Product Article

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If you're involved with electrical manufacturing and the procurement, planning, or processing of board-level components, you already know what a complex, crazy, and intense world this can be.

Component manufacturers often miscalculate the demand for their parts and/or simply cannot keep up with demand, so customers get quoted some ridiculous lead-times — like 52 weeks. Or, the part you have built into your product has just gone end-of-life with no replacement in sight, so you are racing against the clock to get your engineer to redesign the board with a new part. And, if the redesign doesn't go through in time, there go your profits for the quarter! These are typical, everyday examples of how the supply chain works in this industry.

Waiting a full year to get a product into production, or possibly not getting it out the door at all are not viable options for any business. The result has been that OEMs and EMS companies have no other choice but to turn to the independent distributor market for help in procuring these hard-to-find components. Independents like FIRST BYTE MICRO LTD search the globe to locate these difficult parts through vast supply chain networks. But this is where things can get sticky. Since some of these tiny chips can cost hundreds of dollars per piece, and a manufacturer could need several thousand of them on boards that are in production, this turns out to be a very high-dollar market segment. Combine this potential for high revenue generation with the fact that the client looking for these parts is already in a critical state (desperate even, at times), stir in human nature (greed) and you have the perfect combination for counterfeiters and crooks to prosper.

Monstrous Problems
Counterfeit components create monstrous problems on several levels. Obviously, if the parts don't work, the manufacturer's product does not get out into the market; the company has lost money, holding a bunch of populated boards, and will likely have to fight to get a refund for the sub-par materials. But, even worse than that, what if the finished products do make it out into the field? Sometimes counterfeit components will work just long enough that the end-product will pass initial QC tests and make it out to the market. What if the end-product is life critical or ends up in a military or aviation product? Not only is there potential for huge financial loss, but, in some cases, also the loss of human life. Obviously, the threat here is huge.

Since obsolescence and lead-time issues will always be problematic for electronic designers and manufacturers, it is not a feasible solution to procure all electronic components directly from the component manufacturer or an authorized dealer — the suggested solution offered by many component manufacturers. Obviously, they are only looking out for their own best interest, not the best interest of their customers. Nor are they in any way contributing a valid solution for ending this epidemic. All of these factors have led to the independent distributors who procure these hard-to-find components through their excess inventory channels. Thus these distributors have become a critical partner in the electronic manufacturing supply chain. Cutting them out completely is simply not an option.
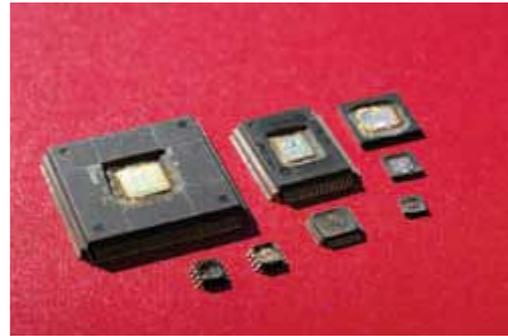
Physically decapsulating ICs is often needed to see what's really inside.

The problem here is that anybody with an Internet connection and a business license can set up shop and call themselves an independent. Just because somebody has a website with part numbers listed on it does not mean that they are any good. It does not make them ethical or ensure that they will practice due diligence to protect their clients from receiving sub-par materials. That being said, there are also many upstanding, moral, caring, and concerned independent distributors out there that set themselves apart from the rest of the pack. They have policies, procedures, and software in place to identify the good vendors over the bad. They have equipment and step-by-step guidelines for inspecting and testing components to verify that they are authentic. And, despite all this, they still sometimes get a bad rap.

Instead of grouping all independents in the same class, it is important to identify who the honest and reputable ones are and then strategically align yourself with them. After all, these are the people who save the day when you are looking at a daunting lead-time or obsolescence issue while your clients are demanding their product and your boss wants that profit report on his desk at the end of the quarter.

An X-ray inspection may be the final step before "passing" an IC.

Ask Lots of Questions
With that in mind, here are a few tips on how to determine if a vendor is reputable and trustworthy so that you can protect yourself when procuring these difficult components.

- Ask lots of questions! Where are they getting the parts from? What are their policies and procedures for accepting a vendor onto the AVL (Approved Vendor List)? What are their QC inspection procedures? Will they send you a copy of their quality manual? Can they provide photos of the part? Can they provide testimonials and references? What is their RMA rate? What is their return and refund policy? What is their warranty period? The simple act of asking questions will scare off a lot of questionable vendors. If they are unable or unwilling to share this information with you, it's a huge red flag.
- What type of in-house testing capabilities does the distributor offer? Visual inspection techniques alone are not enough to identify counterfeit components and validate good parts. Having the capabilities to decapsulate an IC to verify the die inside and also to have some level of electrical testing available to test output are bare minimums to successfully identifying counterfeits. More advanced equipment such as X-Ray and SAM machines are extremely effective in detection non-conformances. If the vendor has zero equipment in place, then how they are going to protect you?

Certifications Are Needed

- What certifications do they carry? What compliances do they meet? There are many certifications out there that a reputable company will invest the time and money to become compliant or even better, certified. ISO 9001 is a standardized quality management system that ensures good quality management practices are being consistently practiced. ESD S20.20 is the standard that spells out technical requirements to maintain an ESD control program. AS9100 is a quality control standard that incorporates ISO 9001, but is specific to the aerospace industry. These are some basic standards that should be implemented in all reputable independent distributor organizations. If they are not at the very least compliant with these standards, you might want to look elsewhere.
- What groups or affiliations are they aligned with? There are a lot of great organizations out there that work hard to protect our industry. These include: **SMTA** is an organization for professionals involved with electrical manufacturing that focuses on quality control.

  IDEA is a non-profit dedicated to advancing ethics, setting standards and educating those involved with the industry.

  ERAI monitors, investigates, and reports issues affecting the global supply chain of electronics.

  There is power in information and in numbers. A good vendor will definitely have some trade association memberships and some strategic alliances in place.

- Google Them: What buzz is associated with the company online? Are they part of the solution to combating counterfeits? If not, they are part of the problem! If there is no online presence for them whatsoever, than that is definitely a red flag. Or, if they are working out of their basement according to Google maps, you might want to think twice before sending a huge purchase order.

No Magic Solutions

- Use the Common Sense Rule: If it sounds too good to be true, it probably is! If all of your normal vendors are telling you no stock is out there or that the price is high and you magically find a bunch of what you want on the cheap from some unknown vendor, run the other way! Most likely, they are going to have some parts painted up for you in China and your boards will blow up when you populate them. This has actually happened, more often than gets publicized, so be wary.

Using some care, caution, and common sense, you can successfully procure hard-to-find components from the independent distributor market without getting "burned." You have just found a distributor you can trust FIRST BYTE MICRO LIMITED, build a close relationship with us and stick closely by our side. We are on your team and will help protect you and your company.