



# Angotti Product Development Newsletter

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## Can you cope with the upcoming parts shortages due to the COVID19 shutdown?

### Executive Summary

This article outlines how a company can respond to the upcoming shortages created by the COVID19 virus that has shut down companies across the globe. This information is valuable as well for other future disasters that cause scarcity in various parts' availability. During shortages, even a single unavailable part can hold up completion of the assembly of an electronic product. What will your company do to respond?

### Background

The concept of JIT (Just in Time) manufacturing is a very economically efficient way to produce and distribute products. JIT creates a situation where there is almost no store of parts in the parts pipeline. Also, for the last several years, companies in their search to reduce product costs have diversified globally to seek the lowest cost parts sources. Both of these can create severe logjams in product availability as the worldwide economies begin reopening after a disaster. This article focuses on what might help with this situation when product Fabrication and Assembly begin to ramp up.

A response to the upcoming product production ramp-up takes two forms, what can be done for products still in design, but not yet released to production and those that are already in production. Be sure to note that any alterations of specified parts in the design must be done by, or approved by, a person sufficiently skilled to assess the substitution of the part. Many companies have formalized this process. Smaller, less formal ones usually rely upon the design engineer to approve these changes.

### Products in Pre Release to Manufacture

First, always minimize sole-source parts; then locate and specify alternate source parts. See the comments in Table 1 below.

Table 1

Potential Problem Part	Action	Remarks
Resistors	Search for trusted equivalent parts and check for compatibility cost and	These parts are relatively standardized. There are numerous reliable vendors.

<b>Capacitors</b>	delivery. Search for trusted equivalent parts and check for compatibility cost and delivery.	Compatibility is a bit harder to achieve than for resistors. There are several critical variables.
<b>Inductors</b>	Search for trusted equivalent parts and check for compatibility cost and delivery.	Compatibility is a bit harder to achieve than for capacitors. Several critical variables, along with mechanical variations. Consider strongly dual footprint for designs.
<b>Integrated Circuits</b>	Except for a few Standard parts, these are often a single source device. Glue logic can be substituted with parts from trusted suppliers and checked for compatibility and cost.	Sometimes parts have a dual voltage or footprint equivalents. Consider dual footprints for both parts. Usually, dual voltage parts require testing before they are specified.
<b>Relays</b>	Except for a few standard footprint parts, these are often a single source device. Check for substitute parts from trusted suppliers and check for compatibility and cost.	Many parts have dual footprint equivalents. Strongly consider dual footprint layouts for both parts.
<b>Custom Mechanical Parts</b>	Search for and locate second sources from a different vendor.	One vendor might be lower priced and might be selected as the preferred one. If parts volume requirements are low, this might become a significant challenge. Tight tolerance can also introduce additional problems.

## Products after Release to Manufacturing

All of the discussions below require formal engineering approval for a part to accept as an alternate source.

### Locate Alternate Sources

In a time of shortage, you need patience and persistence to locate alternate parts. Alternate parts are the least expensive approach to getting production up and running again.

**Table 2**

Potential Problem Part	Action	Remarks
Any Part Available in normal Distribution Channels and using the criteria discussed in	Try the usual and trusted sources such as Digikey, Mouser, Newark, Allied, etc.	Depending upon your experience, consider other distribution vendors in this

Table 1.		class.
Any part available in less reliable distribution channels and using the criteria discussed in Table 1.	Try first the less trusted vendors, and then move to the “Gray Market” to find critical parts.	These vendors may have higher costs for parts or be unreliable in service or shipment time. Gray market parts sometimes are not produced by the stated manufacturer.

Note that Altest Corporation ([www.altestcorp.com](http://www.altestcorp.com)) has a large inventory of quality parts, which are available to supply to companies that need them.

#### Redesign for alternate sub-systems or parts

If you can not locate an alternative part, then the PCB can be redesigned to hold another part. A redesign is the most expensive way to get the production line moving again. It also may create minor to significant delays in getting production ramped up. Preplanning is always superior to these solutions. See Table 3 below.

**Table 3**

Potential Problem Part	Action	Remarks
Specified Part is unavailable, out of production but an alternate part package is available.	Redesign of the PCB to accommodate the new package footprint.	The PCB redesign typically must be done and then tested to ensure full compatibility. Requires access to the original layout files, or the approach can be more costly.
Specified Part is now totally unavailable, and an alternate part package is unavailable. All source design files <u>are</u> available.	Redesign from a known starting point. This approach requires source Schematic, BOM, and Layout files. If the device is a microcontroller, then source code is needed.	The biggest concerns are FPGA or microcontroller changes. These can become costly and require schedule delays.
Specified Part is now totally unavailable, and another part package is unavailable. Source design files are <u>not</u> available.	Reverse engineer design required. Very difficult If microcontroller source code is not available.	A large number of concerns that can include FPGA or microcontroller redesigns. These can become very costly and require very long schedule delays.

### **We Can Help**

Do you, or does someone you know, have concerns about being ready for the upcoming parts shortages? Angotti Product Development can provide an alternate source for parts selection and substitution redesign services. If you have such a need, give us a call at 408-462-2189 or email us at [carl@angotti.com](mailto:carl@angotti.com), and we can discuss your concerns. You can learn more about us at [www.angotti.com](http://www.angotti.com) .

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