

# FPGA Single Point of Failure

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A SINGLE POINT OF FAILURE FOR critical applications within the Defense Industrial Base are Field Programmable Gate Arrays (FPGA) that rely on solder columns to connect to PC boards.

A surprisingly small number of civilians, primarily engineers and department managers in the supply chain, continue to make policy decisions that could have a profoundly harmful effect on U.S. national security. 90% of ruggedized FPGA that use solder columns are supplied by a tiny sole-source subcontractor located in Silicon Valley, California.

Supply chain decision makers have decided through their actions, or inaction, not to qualify an alternative supplier for solder columns. This policy of depending on one supplier without a back up overlooks the potential that the current sole-source subcontractor of solder columns certainly cannot continue to provide this vital service forever.

## Vulnerable Choke Point is Ignored

It is well known by thought leaders within the Defense Industrial Base that solder columns are the “Achilles Heel” for sustainability and resiliency of ruggedized FPGA components in the supply chain.

Warfighters and missiles cannot be operable without solder columns attached to FPGA components.

Our Nation does not have a “Plan B” to immediately step in and fill the supply chain void should a demand surge exceed the capacity of the current sole source supply of solder columns.

Subject matter experts estimate that as a consequence of COVID-19, it may take three years for the U.S. Defense Logistics Agency (DLA) to clear its backlog schedule and resume field audits for the purpose of certifying a second source of solder column attachment services.

In the meanwhile, the defense industrial base remains vulnerable,

A study released by the National Defense Industrial Association (NDIA),

Category	Assessment
Column Attachment Production Lines	Single
Skilled Labor Pool	Mature
Innovation	Limited
Business Continuation Next 5-years	Uncertain
Business Continuation Beyond 20-years	Doubtful
Current Production Capacity	Line is Full
Potential for Delayed Delivery	High
Probability for Price Increase	High
Forecasted Customer Demand for Columns	High
Surge Readiness	Questionable
Capability to Expand Production	Limited
Threats by Force Majeure	Earthquake/Fire
Terrorism / Espionage / Civil Unrest	Potentially
Equipment Condition	Aging
Threats to IP / Hacking	Unknown
Potential for Business Interruption	Probable

## Risk Analysis of Relying on Sole Subcontractor of Solder Columns.

titled, “Vital Signs: The Health and Readiness of the Defense Industrial Base” generally indicates a grade of “Unsatisfactory, Fail” for the readiness of the U.S. defense industrial base.

### Risk Summary

The current source of 90% of the industry’s column attachment services will not last forever. It is risky for the Defense Industrial Base to expect that such services will be around 5 years from now, let alone another 20 years.

Small enterprises with aging owners rarely grow their businesses by investing in new equipment and hiring fresh management.

A number of risk factors suggest low confidence that the business is assured of being capable of meeting a demand surge.

### Summary

Major producers of defense-grade

FPGA components, including market leaders Microchip, Texas Instruments, Xilinx and others seem satisfied with relying on a sole source for the critical last step of attaching solder columns.

The industrial base is reluctant to expand their reliance beyond the current single source subcontractor who provides 90% of America’s solder column attachment services.

### Conclusion

The Department of Defense (DoD) should consider offering incentives to encourage the private sector to qualify alternative sources of solder columns.

Defense grade FPGA components depend on solder columns to keep warfighters operational.

America remains vulnerable to losing her leadership position in the world as the primary source of these devices. ♦