

# Onshoring Defense Microelectronics Production



The 2021 National Defense Authorization Act includes new rules for the production of circuit boards that are used by the Department of Defense.

As more companies consider reshoring and onshoring their manufacturing operations, Uncle Sam is taking a similar stance with some electronics components. The [\\$740 billion 2021 National Defense Authorization Act](#) includes the requirement that the Department of Defense (DOD) stop using circuit boards produced in China, Russia and other “potentially adversarial” countries in its mission systems.

According to [FCW](#), the bill prohibits DOD from buying circuit boards used for mission-critical functions from these countries starting in 2023, with exceptions for commercial-off-the-shelf products and services. “The legislation also names North Korea and Iran as off-limits, but the U.S. already has rules in place banning most trade with either country,” [FCW](#) points out.

## Critical Components

Used to help electronics from televisions to supercomputers function, microelectronics like printed circuit boards have become a larger part of the defense supply chain security conversation—especially this year, as the COVID-19 pandemic made certain items difficult to make and buy.

“The Trump administration has focused a lot on China and its national security risks when it comes to microelectronics, such as potentially siphoning sensitive data during the manufacturing process,” [FCW](#) reports. “And with growing competition with China and national security concerns heightened by the pandemic, congress and the Defense Department have pushed to tighten its cybersecurity and technical supply chains.”

Regulations on printed circuit board manufacturing from the defense secretary wouldn’t come out until mid-2022, according to the bill, but changes are expected to take shape in the next year as DOD works with electronics companies, contractors and suppliers to determine sourcing and capability needs.

## What Started it All

The origins of the new circuit board production rule can be traced back to the current administration’s national security concerns when it comes to foreign dominance in microelectronics. “The semiconductor industry is at the root of our nation’s economic strength, national security and technological standing,” Michael Kratsios, the White House’s CTO, said during a recent public address.

Semiconductors are foundational for tech like cloud computing, artificial intelligence (AI), 5G and autonomous vehicles, and increasingly officials are waking up to the idea that relying on foreign suppliers creates national security vulnerabilities, [FCW](#) reports.

“The U.S. leads the world in semiconductor design and R&D, according to data from the Semiconductor Industry Association, but “the lion’s share of chip manufacturing is now occurring in Asia,” the publication notes. “Additionally, the COVID-19 pandemic has disrupted supply chains, workforces, and demand.”

According to [National Defense Magazine](#), microelectronics underpin some of DOD’s key capabilities including artificial intelligence, advanced manufacturing and space systems.

However, the Pentagon has long warned that the United States is too reliant on systems and components made abroad, particularly in China, and that it must bolster its own domestic industry to hedge against future national security risks. The technology is now the department's top research-and-engineering modernization priority.

#### **“That’s What We Need to Reverse”**

While many of the microelectronics available in the United States are designed here, many of them are manufactured overseas. This presents problems for national security, and for the DOD, [the agency says](#).

“While we still design components, field-programmable gate arrays, application-specific integrated circuits and printed circuit cards in the U.S., the majority of fabrication, packaging, testing etc., is done offshore,” Ellen M. Lord, the undersecretary of defense for acquisition and sustainment, pointed out in a recent fireside chat. “We can no longer clearly identify the pedigree of our microelectronics. Therefore, we can no longer ensure that backdoors, malicious code or data exfiltration commands aren’t embedded in our code.”

Over the last several decades, governmental policies and regulations, environmental constraints, safety constraints, wages and taxes drove up the cost to manufacture microelectronics in the U.S., and that this was one of the causes of industry moving manufacturing overseas, Lord said. “That’s what we need to reverse.”