

*This article originally appeared on [engineering.com](https://www.engineering.com), November 3, 2025.*

# Advancing Open Standards for the Next Generation of RF Interconnects

*VITA and SOSA guide interoperability in modular RF systems for defense and aerospace.*

*This article is sponsored by TTI Inc.*



*(Image: TTI Inc.)*

Modern defense systems depend on a complex network of modular electronics. At the core of this technology is the VITA Standards Organization, which leads the development of open standards for embedded computing, including the VPX architectures used throughout military and aerospace applications. These standards define how boards, connectors, and backplanes fit and function within rugged environments. Building on that foundation, the Sensor Open Systems Architecture (SOSA) Consortium brings together government, industry, and academia to align system architectures across radar, communications, electronic warfare, and signals intelligence systems.

“Open standards are vital because they eliminate vendor lock-in, accelerate technology refresh cycles, and enable interoperability across platforms and suppliers,” says Domenic LoPresti, Director of Engineering at Amphenol SV. “For defense programs, that means faster deployment, reduced cost, and the ability to integrate best-in-class technologies from multiple vendors without starting from scratch.”

SV Microwave contributes directly to the development of both VITA and SOSA standards, lending its engineering expertise in RF interconnect design and testing. The company helps define test protocols, connector mechanical envelopes, and RF performance benchmarks that guide how connectors are built and evaluated.

“One of the biggest challenges is balancing signal integrity at high frequencies with the mechanical robustness required for harsh military environments,” says LoPresti. “Our goal is to ensure that when system designers choose VITA/SOSA-compliant hardware, they have absolute confidence in performance from DC to millimeter-wave frequencies.”

SV Microwave produces several connector types tailored to different performance needs, balancing size, frequency, and durability. The SMPM series is commonly used in VPX backplane applications where engineers need a compact connector that still provides strong mechanical performance and power handling. The SMPS series offers a smaller footprint while maintaining excellent electrical performance at higher frequencies.

SV Microwave has recently added NanoRF to its [VITA 67.3 connector family](#). Able to support up to 20 RF connections within a single slot, NanoRF is the highest-density VITA 67.3 series. This ability to route a high number of RF connections within a single VPX slot without compromising signal integrity makes it well-suited for next-generation radar and signals-intelligence payloads.

To support system design and prototyping, SV Microwave has backplane developer kits, complete with ruggedized cable assemblies, and edge-launch components that help engineers integrate connectors easily into their system designs. The company also takes a system-level approach to testing.

“We don’t just qualify a connector in isolation—we test it as part of a VPX module or chassis, validating signal integrity, mating cycles, thermal performance, and shock/vibration compliance,” says LoPresti.

The verification process employs 3D electromagnetic simulation, environmental qualification, and electrical and mechanical testing to confirm that every design meets VITA and SOSA performance requirements. In addition to its internal validation work, SV Microwave provides testing tools, validation kits, and installation and removal tools to help engineers verify compliance within their own systems.

SV Microwave’s contributions to standards development are reflected in its work on the VITA 67 family of RF interconnects. “We helped define test methods for insertion loss, return loss, and durability under military environmental conditions,” says LoPresti. “These protocols are now widely adopted by system integrators and ensure that all compliant products deliver consistent, repeatable RF performance.”

The company actively sits on SOSA committees that help establish the appropriate RF signal contact types and I/O interfaces for open-architecture systems.

As VITA standards continue to evolve, two upcoming specifications—VITA 90 and VITA 100—aim to increase the speed and density of modular interconnects. VITA 90 focuses on integrating optical and RF connections, allowing both light-based and radio-frequency signals to travel through the same hardware. VITA 100 looks ahead to even higher-speed designs.

SV Microwave continues to develop hybrid optical/RF modules that combine both signal types in a single connector. Its existing VITA 66.5 product line, which already merges optical and RF links, serves as a foundation for this ongoing design work.

SV Microwave works closely with TTI to help make standards-compliant components easier to source. “Our partnership with TTI ensures that engineers have quick access to off-the-shelf, VITA/SOSA-compliant interconnect solutions backed by deep technical support,” says LoPresti. “TTI’s distribution network makes it easy for program managers and designers to prototype, scale, and deploy systems faster without long lead times or supply chain risks. This collaboration extends beyond logistics—TTI helps us educate engineers on open standards and ensure that when they specify SV products, they’re choosing solutions already aligned with VITA/SOSA requirements.”

To learn more, visit [Amphenol SV at TTI](#).