



# VITA™ 90 VNX+™

Samtec interconnects and alignment features selected for both the PIM and Backplane for small form factor, high-performance, rugged functionality.

Q126

INNOVATIVE TECHNOLOGIES • SUDDEN SERVICE • GLOBAL REACH

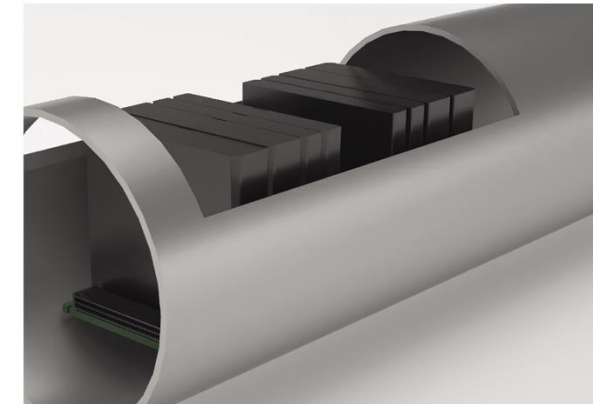
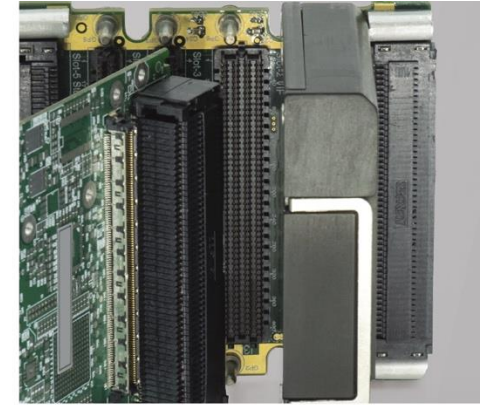
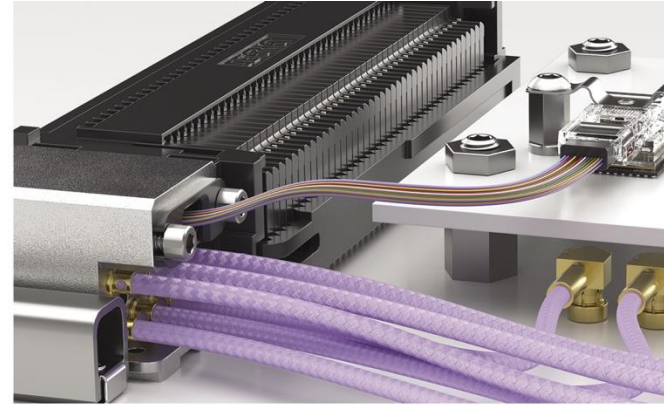




# VITA™ 90 VNX+™ INTERCONNECT SOLUTIONS

VITA™ 90 VNX+™ is a next generation, small form factor (SFF) standard designed to support modular, high-performance embedded computing systems across defense, aerospace and industrial applications.

A SWaP alternative to 3U OpenVPX, VNX+ modules are a fraction of the size of existing OpenVPX modules.





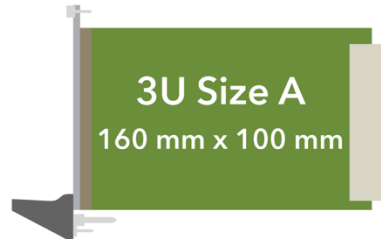
# VITA™ 90 VNX+™ SMALL FORM FACTOR



Size comparison:  
VNX+ versus Cards 3U and above.

70% Size of 3U Cards

VNX+  
78 x 89 mm



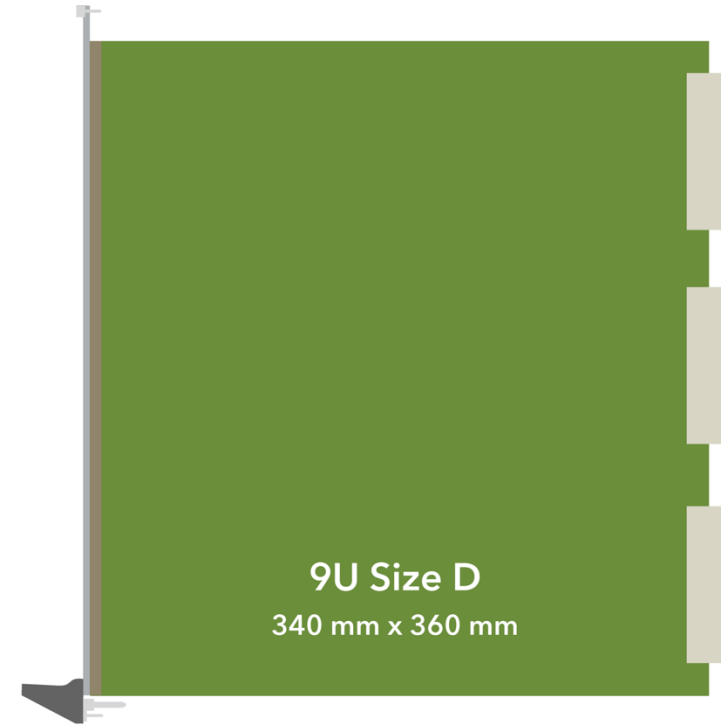
3U Size A  
160 mm x 100 mm



6U Size B  
160 mm x 233 mm



6U Size C  
340 mm x 233 mm



9U Size D  
340 mm x 360 mm

Legacy Add-In Cards



# INTERCONNECTS & ALIGNMENT FEATURES

Samtec's rugged high-density, high-performance interconnects and alignment features were selected for the VITA 90 standard.

## High-Speed Data Connector (HSDC)

- Samtec SEARAY™

## Connector Module (CM)

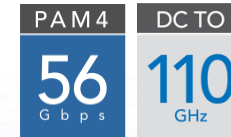
- Samtec GPCC-20, GPCC-16 Coaxial Contacts (MT ferrule slot can accommodate FireFly™ or FireHawk™ assemblies)

## Primary Alignment Feature (PAF)

- Samtec Receptacle & Guide Pin

## Dimensions, Plug-In Module (PIM)

- 89 x 78 mm
- Single height: 13 or 19 mm
- Double height: 27 or 39 mm



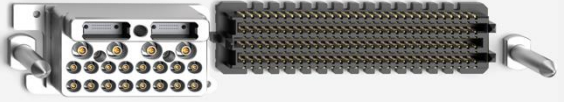
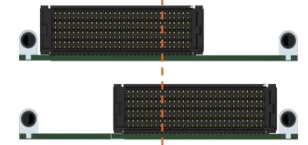




# A FAMILY OF STANDARDS

The commonality of VNX+ designs encourages interoperability and replaceability, along with design reuse. Standard COTS solutions (versus customs) offer the flexibility to quickly upgrade or modernize hardware for keeping up with evolving needs.



| STANDARD  | TITLE                                                                                                                                                                                                              | REFERENCE                                                                                                                                                                |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VITA 90.0 | <b>VNX+ Base Standard:</b> <ul style="list-style-type: none"><li>SEARAY™ &amp; Guidance System</li><li>56 Gbps PAM4 &amp; FMLB</li></ul>                                                                           |                                                                                       |
| VITA 90.1 | <b>VNX+ Profile Tables:</b> <ul style="list-style-type: none"><li>Application signaling, slot profiles</li><li>Instructs users on creating unique slot names to ensure PIM &amp; Backplane compatibility</li></ul> | Ethernet, PCIe®, SATA, USB, HDMI, General Purpose Serial Ports or Electrical, Signal over Coax, CVBS, STANAG 3350, SDI, CoaXPress, ADVB, DisplayPort, CANbus, GPIO, etc. |
| VITA 90.2 | <b>VNX+ Optical &amp; Coaxial Connector Modules:</b> <ul style="list-style-type: none"><li>Coaxial Contacts (DC to 110 GHz), MT Ferrule Slot</li><li>Adjacent to SEARAY™</li></ul>                                 |                                                                                       |
| VITA 90.3 | <b>VNX+ Power Subsystem Modules:</b> <ul style="list-style-type: none"><li>SEARAY™ placement, pin spacing</li></ul>                                                                                                |                                                                                      |
| VITA 90.4 | <b>VNX+ Cooling &amp; Mounting Systems</b>                                                                                                                                                                         | Alternate retention and thermal management system features in VNX+ systems.                                                                                              |
| VITA 90.5 | <b>SpaceVNX+: Optimizing VNX+ for Space</b>                                                                                                                                                                        | Draft beginning Jan. 2026                                                                                                                                                |

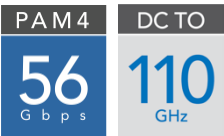


# VITA™ 90.0 HIGH-SPEED DATA CONNECTOR (HSDC)

VITA 90 VNX+ defines Samtec SEARAY™ connectors for backplane and plug-in-modules in 13 & 19 mm single- and 27 & 39 mm double- stack heights.

## SEARAY™ High-Density Arrays

- 56 Gbps PAM4 performance
- Rugged, high-density, scalable connectors
- High-reliability contact system
- Open-pin-field design for routing flexibility used in each slot profile
- Available in a variety of pin counts to accommodate half and full VITA 90.2 optical/RF connector modules
- Also supports VITA 90.3 power supply units (right-angle connector in a 19 mm stack height with 240 or 320 pin counts)

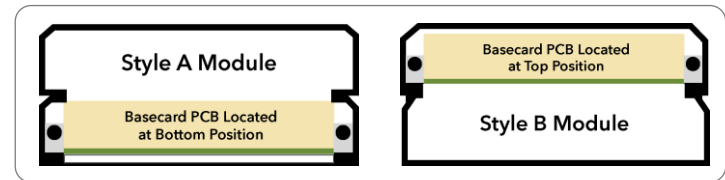


SEARAY™



Single-Height Module

| Style                 | 4-row Connector     | 8-row Connector     |
|-----------------------|---------------------|---------------------|
| Single-Height         | 13 mm PIM           | 19 mm PIM           |
| Double-Height Style A | 27 mm PIM – Style A | 39 mm PIM – Style A |
| Double-Height Style B | 27 mm PIM – Style B | 39 mm PIM – Style B |



Double-Height Module  
Basecard PCB Position vs. Module Style (39 mm PIM shown)

| PIM HEIGHT (mm) | HSDC PIN CONFIGURATION | HSDC PART NUMBERS (MATED SETS: PIM, BACKPLANE) |                                 | POWER SUPPLY PART NUMBERS       |                                 |
|-----------------|------------------------|------------------------------------------------|---------------------------------|---------------------------------|---------------------------------|
| 13/27           | 200 pins (4x50)        | ASP-232969-01,<br>ASP-232968-01                | ASP-232969-02,<br>ASP-232968-02 | Mated Sets                      |                                 |
| 19/39           | 240 pins (8x30)        | ASP-232971-01,<br>ASP-232970-01                | ASP-232971-02,<br>ASP-232970-02 | ASP-232971-01,<br>ASP-232970-01 | ASP-232971-02,<br>ASP-232970-02 |
| 19/39           | 320 pins (8x40)        | ASP-232973-01,<br>ASP-232972-01                | ASP-232973-02,<br>ASP-232972-02 | ASP-232973-01,<br>ASP-232972-01 | ASP-232973-02,<br>ASP-232972-02 |
| 19/39           | 400 pins (8x40)        | ASP-232975-01,<br>ASP-232974-01                | ASP-232975-02,<br>ASP-232974-02 | N/A                             |                                 |

Part numbers & ordering information: [samtec.com/VNX-plus](https://www.samtec.com/VNX-plus)



# VITA™ 90.2 CONNECTOR MODULE (CM)

## VITA™ 90.2 Block

- Plug-in contacts, cables to form a full CM solution for both PIM and backplane
- Precision machined aluminum
- 500 mating cycles
- Reliable mating, repeatable performance
- Environmental qualification: VITA 47, DO-160, MIL-STD-810



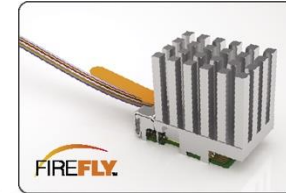
## VITA™ 90.2 RF Contacts & Cable

- 110 GHz, 50  $\Omega$  high-density size 20 contacts ([GPCC-20](#))
- 75  $\Omega$  size 16 contacts ([GPCC-16](#))
- Shrouded to protect from FOD
- Radio Frequency or video signals
- RF047-A Series Cable
- End options: -20VP/-20VS, -16VP/-16VS



## VITA™ 90.2 Rugged Optics

- MT ferrule slot pluggable with FireFly™ or FireHawk™ optics assemblies
- FireFly™ mid-board optical transceivers support up to 28 Gbps per lane in x4 and x12 configurations
- FireHawk™ ruggedized mid-board optical transceivers support 10 Gbps per lane in a x4 configuration
- Visit [samtec.com/optics](http://samtec.com/optics) for details



## Steps for Building a Connector Module Solution



1. Choose Block



2. Choose Contact



3. Choose Cable Option (RF/Optical)



4. Finished Solution

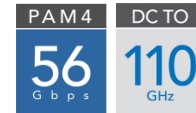






# VITA™ 90.2 CONNECTOR MODULE (CM)

A variety of slot profiles are available to support a range of VNX+ configurations and applications requiring RF, video, or high-sensitivity sensor connectivity. Samtec's modules fill a variety of needs in both full and half aperture size ranges, with MT ferrules accommodating 12 & 24 fibers, and size 16- & 20-gauge coaxial contacts supporting 50  $\Omega$  & 75  $\Omega$  applications. See [product test reports](#).



| Part Numbers               | Type A                    | Type B            | Type C           | Type D        | Type E           | Type F        | Type G        |
|----------------------------|---------------------------|-------------------|------------------|---------------|------------------|---------------|---------------|
| Plug-In Module Connector   |                           |                   |                  |               |                  |               |               |
| Block                      | RSP-239120-01             | ASP-223034-01     | RSP-224882-01    | RSP-233089-01 | RSP-233410-01    | RSP-233193-01 | RSP-244881-01 |
| Mating Backplane Connector |                           |                   |                  |               |                  |               |               |
| Block                      | RSP-222466-01             | ASP-223035-01     | RSP-224881-01    | RSP-233088-01 | RSP-233409-01    | RSP-233192-01 | RSP-244880-01 |
| Contacts                   | (4) GPCC-16, (16) GPCC-20 | N/A               | (6) GPCC-20      | (8) GPCC-16   | (6) GPCC-16      | (10) GPCC-20  | (24) GPCC-20  |
| Optics Slot                | (2) MT Ferrules**         | (2) MT Ferrules** | (1) MT Ferrule** | N/A           | (1) MT Ferrule** | N/A           | N/A           |

\*Fully Assembled Blocks Shown. Mated Sets indicated by "Type" grouping.

\*\*Pluggable with Samtec's FireFly™ or FireHawk™ assemblies using an MT ferrule on End 2





# VITA™ 90.0 PRIMARY ALIGNMENT FEATURE (PAF)

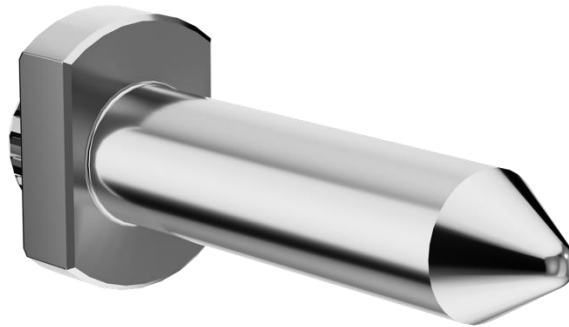
VNX+ modules are supported by Samtec's guidance hardware, known as SureWare™.

## Hardware, Guidance System

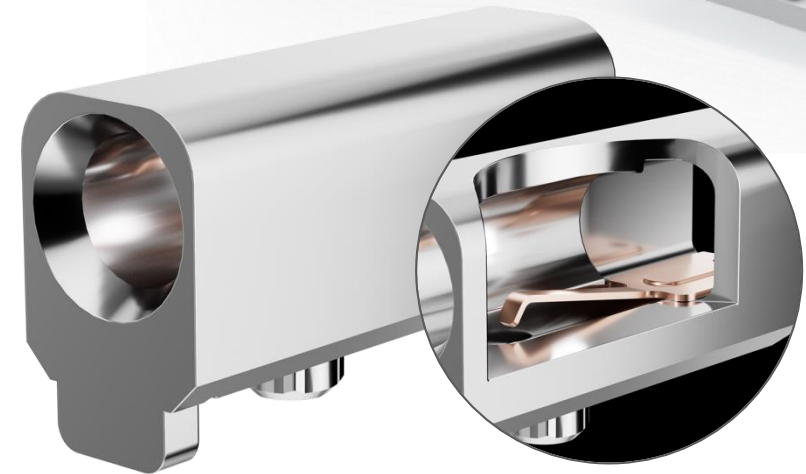
- Two-piece connector guidance system
- Built-in grounding pin enables first mate last break (FMLB) capability
- Right-angle board mount receptacle
- 2 mm minimum ground pin wipe prior to connector mate
- Supports blind mate and backplane applications
- See VITA 90.4 for alternate retention & thermal management system features



**SUREWARE**  
ULTRA RUGGED HARDWARE



Part Number: ASP-222868-01



Part Number: ASP-222864-01

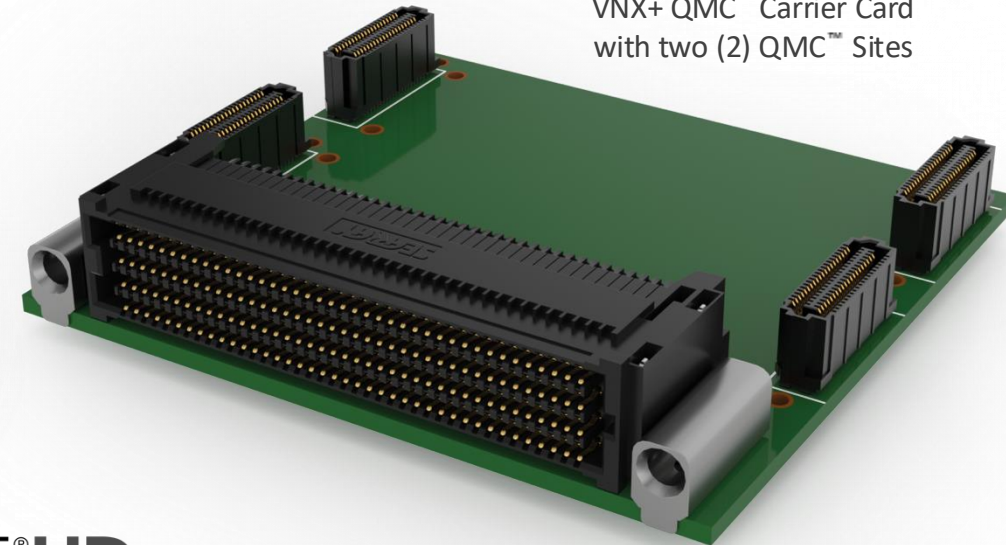
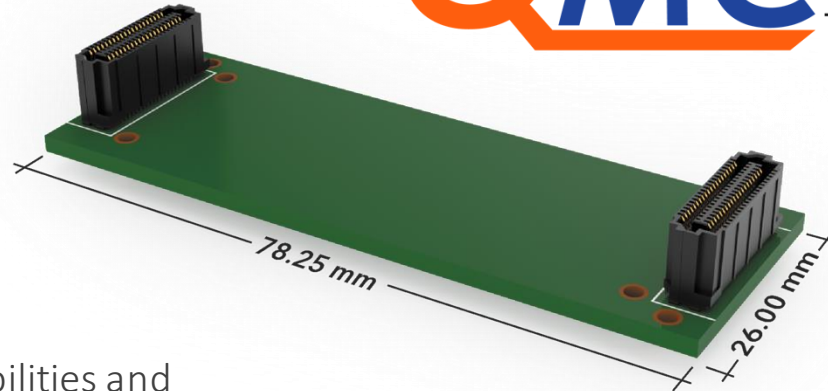
Part numbers & ordering information: [samtec.com/VNX-plus](https://www.samtec.com/VNX-plus)



# MEZZANINE CARD SOLUTION FOR VNX+™

## Quarter Size Mezzanine Card (QMC™) VITA™ 93

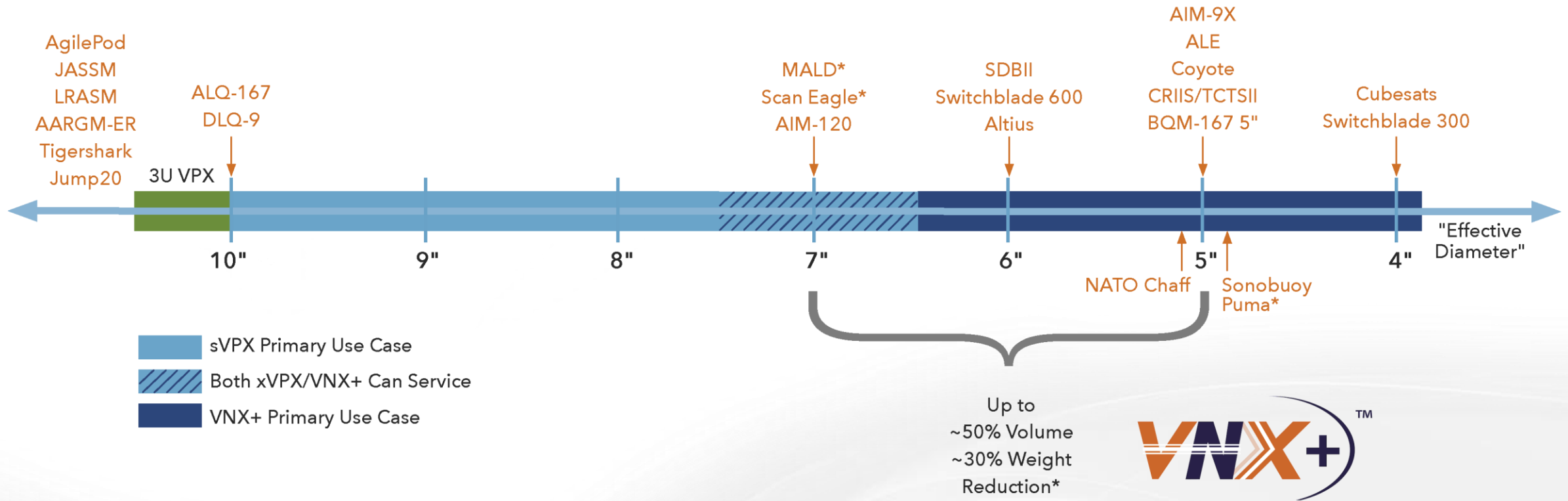
- Can be installed on various carrier card form factors including 3U/6U (VNX+, VPX and cPCI, etc.)
- Suitable for VNX+ small form factor requirements
- 32 Gbps NRZ / 64 Gbps PAM4
- Relies on the high-speed capabilities and slim, dense design of Samtec AcceleRate® HD ultra-dense, slim array connectors
- Various module and carrier height options
- V93.1 I/O Transition Module in development
- For additional info, visit [samtec.com/QMC](https://www.samtec.com/QMC)



VNX+ QMC™ Carrier Card with two (2) QMC™ Sites

## ACCELERATE® HD

| VITA 93™ QMC™ Connector |  |  |  |  |  |
|-------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Part No.                | ASP-239729-01 (Socket)                                                               | ASP-239730-01 (Terminal)                                                             | ASP-239731-01 (Terminal)                                                             | ASP-239732-01 (Terminal)                                                             | ASP-239733-01 (Terminal)                                                             |
| Mated Stack Height      | Standard                                                                             | 9 mm                                                                                 | 11 mm                                                                                | 14 mm                                                                                | 16 mm                                                                                |



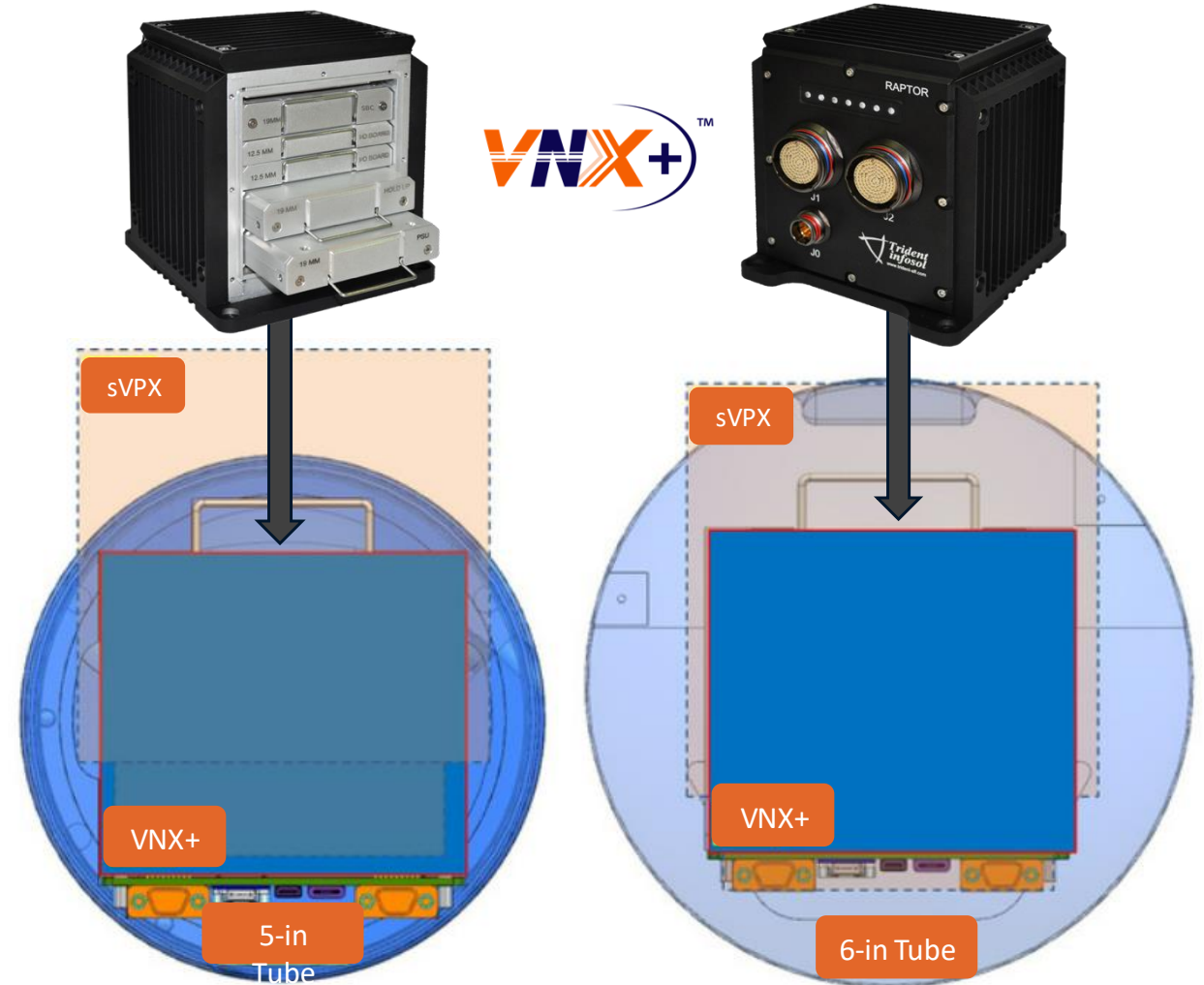
Courtesy of Collins Aerospace, "SOSA VNX for SFF use cases" Presentation

\*Based on a normalized length from the 12' (AIM-120) to the 9' (AIM-9x)



## Rugged, High Reliability, Small Form Factor

- VITA 90 VNX+ adheres to a modular open-system design approach providing system architects a high-performance embedded computing platform
- For space-constrained, harsh environments
- UAVs, UUVs, missiles, satellites, cube sats
- Industrial, military & aerospace
- Provides flexibility to quickly upgrade or modernize hardware for keeping up with evolving needs
- The commonality of VITA 90 VNX+ designs encourages interoperability and replaceability, along with design reuse
- SOSA selected VITA 90 VNX+ as their preferred SFF PIM
- SOSA will incorporate this into their Technical Standard, Edition 2.0" which will be publicly released in 2026



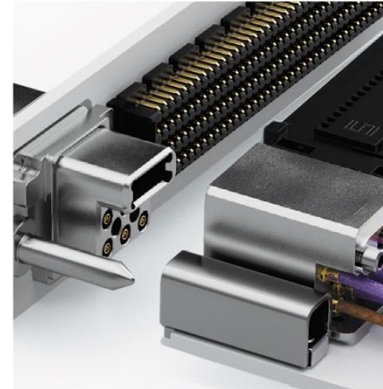
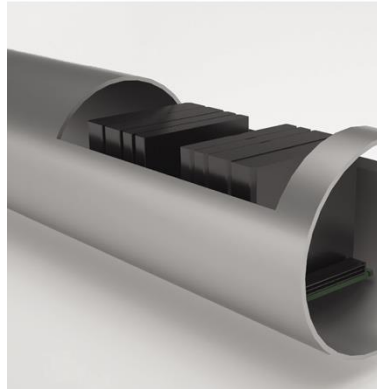
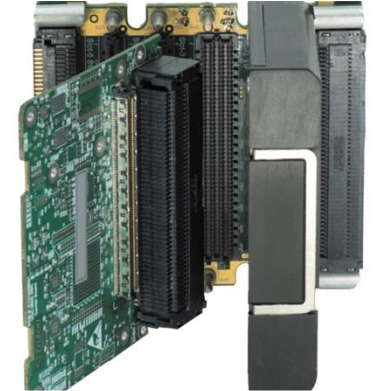
Size comparison of VNX+ versus sVPX in small diameter, space-constrained applications



# SENSOR OPEN SYSTEMS ARCHITECTURE (SOSA™)

## The Open Group SOSA Consortium

- Government & Industry Collaboration
- Sensor Systems & C5ISR (Command, Control, Communications, Computers, Cyber Intelligence, Surveillance and Reconnaissance) Payloads
- SOSA has adopted some VITA standards, including VNX+ ([vita.com](http://vita.com))
- Contact [SOSA@Samtec.com](mailto:SOSA@Samtec.com) or visit [samtec.com/SOSA](http://samtec.com/SOSA) for information about Samtec SOSA-aligned solutions



| RF TOOLS                                                                          |                   |            |              |
|-----------------------------------------------------------------------------------|-------------------|------------|--------------|
| Extraction Tools                                                                  | Samtec Part No.   | Type       | For Use With |
|  | CAT-EX-GPCC-16-01 | Extraction | GPCC-16      |
|  | CAT-EX-GPCC-20-01 | Extraction | GPCC-20      |



| OPTICAL TOOLS                                                                         |                 |                                      |                                                                  |
|---------------------------------------------------------------------------------------|-----------------|--------------------------------------|------------------------------------------------------------------|
| MT Ferrule Inspection & Cleaning                                                      | Samtec Part No. | Type                                 | For Use With                                                     |
|    | OC-022430-01*   | Plug-In Adaptor,<br>1 MTP Horizontal | RSP-239120-01                                                    |
|    | OC-022430-02*   | Plug-In Adaptor,<br>2 MTPs Vertical  | ASP-223034-01                                                    |
|   | OC-022430-03*   | Plug-In Adaptor,<br>1 MTP Horizontal | RSP-224882-01<br>RSP-233410-01                                   |
|  | OC-022439*      | Cleaning Tool                        | RSP-239120-01<br>RSP-224882-01<br>RSP-233410-01<br>ASP-223034-01 |

\*Samtec adaptors work with the following Sumix microscopes: [Manta W+](#) & [Manta HM](#)



