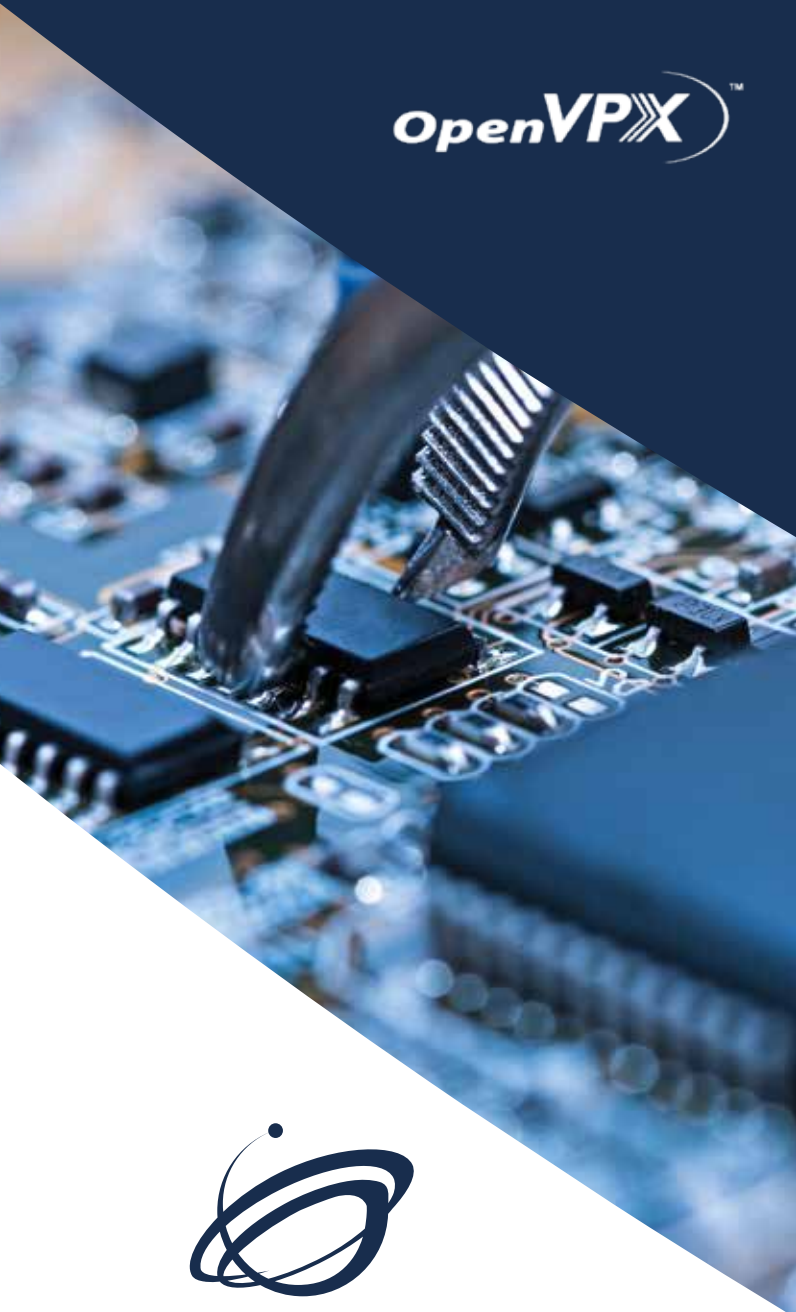# Providing Unprecedented Performance Density

OpenVPX

OpenVPX™

vadatech

THE POWER OF VISION

Why VPX?

MOSA

Modular Open Standard Architectures (MOSA) allow system integrators to use commercial off the shelf hardware from multiple vendors expecting a good level of interoperability, so avoiding the need for custom designed hardware and avoiding lock in. Published open standards allow legacy or special-purpose interfaces to be support by in-house design or by working with dedicated suppliers. The benefits in time to market, business focus and lifecycle costs are widely recognised, with MOSA solutions often mandated by government procurement organisations.

PICMG & VITA

These are two major standards organisations driving modular computing architectures. While the market focus differs, there is notable similarity between the approaches taken, particularly when it comes to AdvancedTCA/MicroTCA and OpenVPX. Both use switched fabrics for high speed interconnects, both support different data pipe widths for various applications, and both recognise the benefits of platform health management. While the TCA standards are prevalent in commercial applications, they also offer cost and size benefits in defence and are used across land, sea and air applications. Even so, OpenVPX is considered the architecture of choice by many defence primes.

FMC

FPGA Mezzanine Cards (per VITA 57) provide an extremely flexible mechanism for including interface and signal conversion capability into both TCA and VPX systems. FMCs typically have limited or no on-board intelligence, but can include high-performance ADC/DACs and RF sub-systems such as transceivers, modulators, or local oscillators. As high sample rate signal conversion products increasingly use high-speed serial interfaces like JESD204B, so FMC+ (VITA 57.4) supports greater bandwidth to the FPGA and improves performance density.

Why VadaTech?

Scope

VadaTech brings an extensive portfolio of field-proven designs to the OpenVPX form factor, with particular emphasis on signal conversion and FPGA products. The product range covers all functionality from front end through to network or user interface, and all platform elements including power, chassis, switch, payload modules and software – including platform health and network switch management. This ability to cover all aspects of platform design allows us to optimize system design for cost, size and weight.

Speed

VadaTech design cores are initially developed for highly competitive commercial markets where performance and time-to-market are key to success. Development costs are amortized over high-volume commercial programs, and the resulting products are field-proven far quicker than would be possible in defence markets. Those cores are then transitioned to OpenVPX form factor, providing robust solutions at a competitive price point. The performance focus of our commercial customers, and our rapid prototyping capability, give speed benefits in both product performance and project timeline.

Flexibility

VadaTech's business model is focused on close collaboration with our customers, extending their engineering design team to produce boards and platforms that meet program-specific requirements. Design re-use from established products, modified or developed to add new features or enhance performance, allows us to deliver custom solutions with accelerated project timelines. These modified COTS (commercial off the shelf) products avoid the compromise of being straight-jacketed to existing designs, while the flexible business model allows customisation at relatively low production volumes.
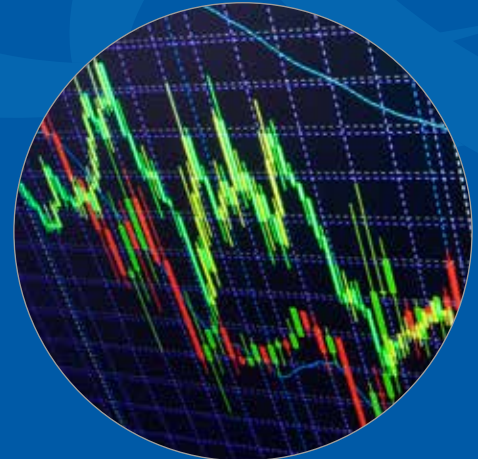
Chassis

Initial VPX chassis offerings are primarily air-cooled units for development and benign deployment, while the broader product portfolio includes rugged platforms up to conduction cooled ATR-style solutions. Chassis designs leverage VadaTech experience in supplying systems deployed in environments from commercial telecoms through to airborne, land-mobile and naval (surface and submarine). The modified COTS business model supports provision of backplanes to different profiles, meeting project-specific I/O requirements. Chassis typically include optional JTAG switch module for ease of FPGA code development.

Software

Our platform health management software, developed and maintained in-house, is widely deployed over hundreds of product types in commercial and defence systems across the world. For defence markets, specific enhancements such as Battle Short and Battle Ready are added. Layer 3 switch management software is also in-house code, providing a comprehensive enterprise-grade routing and switching feature set. All FPGA-based products are delivered with example VHDL under royalty-free licence to accelerate customer design activities, while DAQ Series™ data acquisition software includes a flexible high-performance DMA engine.

Platform

VadaTech supply ranges from boards, to chassis, to complete integrated and qualified platforms. Support services include thermal analysis and airflow characterisation, finite element analysis and shock/vibration testing, and extended stress screening. Working with our customers we agree the appropriate platform-level analysis and test regime required to meet project requirements, and can support full product qualification to telecoms and defence standards. The resulting platforms are used in applications such as radar, sonar, video and COMINT/SIGINT, as well as situation awareness and other process-intensive applications.

Switch/Host

VadaTech switches have health management capabilities built in, based on the in-house field-proven IPMI stack. High speed fabrics such as PCIe, XAUI and SRIO are augmented by crossbar and FPGA switch modules for low-latency transfers or applications needing arbitrary scatter-gather transfers. Sophisticated clocking features include GPS/IEEE1588/SyncE/NTP Grand Master Clock, while Virtual JTAG capability can be included for remote programming and debugging of FPGA code.

FPGA

3U OpenVPX modules provide a full range of Xilinx Series-7 (Zynq, Kintex, Virtex) UltraScale and UltraScale+ FPGAs supporting different price/performance points. Most are FMC carriers for functional flexibility, with high-performance signal conversion products using an integrated design for higher performance. 6U OpenVPX modules include dual Kintex and Kintex-Intel boards. Special function boards can be rapidly developed based on field-proven design cores, and design services are available for IP development where appropriate to support project needs.

ADC/DAC

Signal conversion products, in both VPX and FMC form factor, include ADC up to 6GSPS and DAC up to 12GSPS or higher. FMCs provide the greatest flexibility, with VPX modules providing higher channel count and higher sample rates. RF modules can provide enhanced functionality such as MIMO wideband transceivers, quadrature modulators and frequency-agile LO (local oscillator) generation. This is all supported by low-jitter platform-wide clock distribution for synchronous systems.

Chassis

VTX660	**7U VPX Chassis, Five 3U Payload Slots with RTM Support** 7U by 10", dual 650W AC power, push-pull air-cooled, switch/management slot, optional JSM
VTX661	**7U VPX Chassis, Ten 3U Payload Slots with RTM Support** 7U by 19" rack mount, triple 650W AC power, push-pull air-cooled, dual switch/management slot, optional JSM
VTX870	**OpenVPX Benchtop Chassis, Five 3U Payload Slots** RTM support, removable side panels for ease of access, platform health readout, 650W AC power, push-pull air-cooled, switch/management slot, optional JSM
VTX880	**2U VPX Chassis, Five 3U Payload Slots with RTM Support** 2U by 19" rack mount, 650W AC power, push-pull air-cooled, switch/management slot, optional JSM
VTX881	**2U VPX Chassis, Two 6U Payload Slots with RTM Support** 2U by 19" rack mount, 650W AC power, push-pull air-cooled, optional JSM
VTX950	**1U OpenVPX Rackmount Chassis with Intel Xeon E5 Processor, Two 3U Payload** 1U by 19" rack mount, RTM support, integrated Intel® Xeon E5-2648L v4 host, 500W AC power, push-pull air-cooled, integrated platform health management
VTX951	**1U OpenVPX Rackmount Chassis with Intel Xeon E3 Processor, Two 3U Payload** 1U by 19" rack mount, RTM support, integrated Intel® Xeon E3-1505M v6 host, 500W AC power, push-pull air-cooled, integrated platform health management
VTX955	**1U OpenVPX Rackmount Chassis, Two 3U Payload Slots** 1U by 19" rack mount, RTM support, 500W AC power, push-pull air-cooled, integrated platform health management

Switch

VPX004	3U OpenVPX Switch, PCIe Gen 3
	• Integrated switch and platform management controller with RTM support
	• PCIe Gen3 with optional multi-host DMA support (PEX9765)
	• Layer 3 managed GbE with 10GbE copper to front panel
	• Integrated GPS option with IEEE1588 PTP/NTP Grand Master Clock capability and flexible clock generation and distribution subsystem.
	• Optional JTAG via Ethernet Virtual Probe eases FPGA development.
	• Robust US-sourced platform health management software.
VPX005	3U OpenVPX Switch, 40/10GbE
	• Integrated switch and platform management controller with RTM support
	• 10/40GbE, layer 2 or 3 managed, SyncE and IEEE1588
	• Integrated GPS option with IEEE1588 PTP/NTP Grand Master Clock capability and flexible clock generation and distribution subsystem.
	• Optional JTAG via Ethernet Virtual Probe eases FPGA development.
	• Robust US-sourced platform health management software.
VPX006	3U OpenVPX Switch, CBS
	• Integrated switch and platform management controller with RTM support
	• Crossbar Switch (CBS), protocol agnostic w/ dynamic routing
	• Integrated GPS option with IEEE1588 PTP/NTP Grand Master Clock capability and flexible clock generation and distribution subsystem.
	• Optional JTAG via Ethernet Virtual Probe eases FPGA development.
	• Robust US-sourced platform health management software.

Payload – Processors

VPX754	Intel® Xeon™ SoC, 3U VPX, PCIe Gen3
	Intel Xeon D-1577, D-1548 or D-1520 SoC, PCIe Gen3 x8, dual SATA, dual GbE, front panel video out, USB and 10GbE
VPX756	Intel® Xeon™ E3, 3U VPX, PCIe Gen3
	Processor AMC Intel® Xeon® Processor E3-1505M v6, PCIe Gen3 x8, dual SATA, dual GbE, front panel video out, dual USB 3.0 and RJ45
VPX757	Intel® Xeon™ E3, 3U VPX, 10/40GbE
	Processor AMC Intel® Xeon® Processor E3-1505M v6, dual 40GBASE-KR or dual XAUI, dual SATA, dual GbE, front panel video out, dual USB 3.0 and RJ45

Payload – 3U FMC Carrier

VPX516	**FPGA FMC Carrier, 3U VPX, Virtex-7**
	Virtex-7 690T, 2.5GB DDR3, clock/jitter cleaner, stratum-3 clock option
VPX517	**FPGA FMC Carrier, 3U VPX, Kintex-7**
	Kintex-7 410T, 2.5GB DDR3, clock/jitter cleaner, stratum-3 clock option
VPX518	**FPGA FMC Carrier, 3U VPX, Zynq-7000**
	Zynq-7000 XC7Z100 or XC7C045, 2GB DDR3, clock/jitter cleaner, stratum-3 clock option
VPX519	**FPGA FMC Carrier, 3U VPX, Artix-7**
	Artix-7 XC7A200T, 512MB DDR3, clock/jitter cleaner, stratum-3 clock option
VPX581	**FPGA FMC Carrier, 3U VPX, Zynq UltraScale+**
	UltraScale+ XCZU15EG MPSoC with block RAM and UltraRAM, 8GB DDR4, 64GB user Flash
VPX582	**FPGA FMC Carrier, 3U VPX, Zynq UltraScale+**
	UltraScale+ XCZU7EV MPSoC with block RAM and UltraRAM, 8GB DDR4, 64GB user Flash
VPX592	**FPGA FMC Carrier, 3U VPX, Kintex UltraScale**
	Kintex UltraScale™ XCKU115, 20GB DDR4, clock/jitter cleaner, stratum-3 clock option

Payload – 3U Signal Conversion

VPX597	**300 MHz to 6 GHz Octal Versatile Wideband Transceiver (MIMO), Kintex UltraScale™, 3U VPX** Quad transceiver AD9371, supports TDD and FDD, 250MHz tx BW, 100MHz rx BW, KU115 FPGA, 16GB DDR4
VPX598	**Quad DAC @ 12 GSPS with Quad ADC @ 3 GSPS, Kintex UltraScale AMC** Quad ADC @ 3 GSPS 14-bits (AD9208), quad DAC @ 12 GSPS 16-bits (AD9162/49164), KU115 FPGA, 16GB DDR4
VPX599	**Dual DAC 12 GSPS, Dual ADC 6.4 GSPS, Kintex UltraScale™, 3U VPX** Dual ADC @ 6.4 GSPS 12-bits (ADC12DJ3200), dual DAC @ 12 GSPS 16-bits (AD9162/49164), KU115 FPGA, 16GB DDR4

About us

VadaTech provides innovative embedded computing solutions that offer superior performance density for high-reliability requirements. With a unique combination of electrical, mechanical, software, and system-level expertise, VadaTech provides commercial or rugged computing solutions that work the first time, every time.

AS9100 certified, our quality system provides a consistent and reliable product from initial concept to delivery.

Designed and manufactured in the USA, we utilize open-standard platforms for modularity and scalability, lowering program cost and risk. We leverage our architectures of choice, OpenVPX and MicroTCA, as well as other open platform architectures, to minimize SWaP-C (Size, Weight, Power, Cost) in your application.

Our Expertise Includes Solutions For:

- Signal Processing
- Storage
- FPGA/Processing
- Communications/Networking
- Specialty Solutions
- Design capability

Manufacturing

An AS9100 certified company, VadaTech has a 70,000 square foot manufacturing facility located in Las Vegas, Nevada. It is equipped with the latest state-of-the-art equipment ensuring the highest quality and consistency. This equipment includes several full SMT lines and automated optical inspection. The company also has in-house conformal coating, x-ray inspection, thermal/humidity chamber, shaker table, BGA removal, RTV/epoxy dispenser, stencil cleaner, and selective solder machine.

Every product lot on the SMT line goes through first article inspection. VadaTech is able to trace every serial number to a specific lot and operator at the time of production. With the most advanced equipment and stringent quality processes, we are able to produce highly complex boards and systems with high precision, traceability, and reliability.

Partners

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We are technology leaders

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- Continuous innovation
- Open systems expertise

We commit to our customers

- Partnerships power innovation
- Collaborative approach
- Mutual success

We deliver complexity

- End-to-end Processing
- System management
- Configurable solutions

We manufacture in-house

- Agile production
- Accelerated deployment
- AS9100 accredited

AS9100 CERTIFIED   **ISO**

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