

VP891

3U VPX FPGA Processing Card Virtex UltraScale+, Zynq UltraScale+, FMC+

The VP891 is a 3U VPX high-performance FPGA processing board featuring Xilinx® Virtex UltraScale+™ and Zynq® UltraScale+™ technology. A technology upgrade from the existing VP889 product aligned with the Sensor Open Systems Architecture™ (SOSA) technical standard, it is designed for the most demanding, mission critical military/defense and commercial applications such as communications, sensor processing, radar, electronic warfare, autonomous vehicles, renewable energy stations and semiconductor processing equipment, just to name a few.

Secure

The Zynq UltraScale+ multiprocessor system-on-chip (MPSoC) brings advanced security to the forefront. The VP891 is capable of advanced encrypted bit streams and secure boot capability, enabled by Xilinx tools. This makes it an ideal tool for applications where IP security is a top concern.

Heterogeneous Processing Capability

Many RF and signal processing systems require both a streaming DSP with an FPGA and a general-purpose processor for decisions and control. Traditionally, these processing requirements were handled by separate processing cards. With the VP891, both functions in a single module are available by leveraging application and real-time processing ARM cores of the Zynq UltraScale+ MPSoC. Including the Zynq UltraScale+ MPSoC reduces the need for a

single board computer in some applications, providing customers an efficient way to maximize system performance while reducing complexity.

Flexibility You Need for the System You Want

The VITA 57.4-compliant FMC+ site allows users to take advantage of Abaco's industry leading FMC I/O portfolio. Modular I/O built on an FMC+ standard interface enables engineers to easily upgrade to future technology without a complete system redesign. Availability of both low-latency LVDS data bus and JESD204B/C high-speed serial interface makes the VP891 a versatile solution for many RF data acquisition applications.

Offload Data More Efficiently

The VP891 has VPX backplane interfaces aligned with the SOSA RF payload slot profile, supporting 40/100 Gigabit Ethernet data plane, PCIe Gen3 x4 expansion plane and Ethernet control plane connections to a host computer or other payloads. Dual-channel 100 Gigabit Ethernet optical interfaces are optionally available to support up to 25GB/s data transfers to and from the VP891. High-speed RF signals can also be transferred directly between the FMC+ and the backplane through the P2 connector.

The VP891 is available with two cooling options, air or conduction, making it an ideal COTS product for early designs and capable of being deployed into operational assets. When paired with Abaco's extensive portfolio of multi-architecture processing boards including SBCs, GPGPUs, and fabric switches the state-of-the-art VP891 enables systems to be built from leading edge, interoperable components.

FEATURES:

- Dual FPGA architecture
 - Virtex UltraScale+ VU9P
 - Zynq UltraScale+ MPSoC ZU5EG
- Application Processing Unit
 - Quad-core ARM Cortex-A53
- Real-time Processing Unit
 - Dual-core ARM Cortex-R5F
- Up to 34 GBytes DDR4
- FireFly™ Gen2 Optical Transceivers option
- I/O
 - 10/40/100G Ethernet
 - PCIe Gen3 x4
 - Dual 100G Ethernet optical
 - 8 LVDS GPIO
 - 20 RF-to-backplane (NanoRF) with an accompanying FMC
- VITA 57.4 HSPC FMC+ site interfacing with the Virtex UltraScale+
- Aligned to SOSA standard
- Air-Cooled / Conduction Cooled configurations available
- MIL-I-46058C compliant conformal coating (optional)
- Optional MORA, VITA 49.2, REDHAWK and GNU Radio support

VP891 3U VPX FPGA Processing Card Virtex UltraScale+, Zynq UltraScale+, FMC+

Specifications

Physical Specifications

- 3U VPX 1.0" pitch
- Air-cooled or conduction cooled

SOSA RF Payload Slot Profile

- SLT3-PAY-1F1U1S1U1U2F1H-14.6.11-n

Virtex UltraScale+ FPGA

- XC7VU9P

Zynq UltraScale+ MPSoC

- XCZU5EG

Application Processing Unit (Zynq)

- Quad-core ARM Cortex-A53 MPCore
- Up to 1.5GHz
- Real-time Processing Unit (Zynq)
- Dual-core ARM Cortex-R5F MPCore
- Up to 600MHz

Memory

- Up to two 64-bit 16GBBytes DDR4 (32GB total) memory blocks; up to 2400Mb/s to FPGA
- 32-bit 2GBBytes DDR4 memory to Zynq

FPGA Mezzanine Card (FMC) Support

- 1x HSPC FMC+ site
- Configurable with Abaco's FMC portfolio

Flexible RF/Optical Backplane Options

- Dual NanoRF 10 port connector option for ADC/DAC/ CLK/ TRIG (when used with an FMC)
- Dual 4-lane bidirectional optical interface via FireFly Gen2 (optional) - 100G Ethernet or Aurora independent channels up to 25 GB/s

Operating Temperature

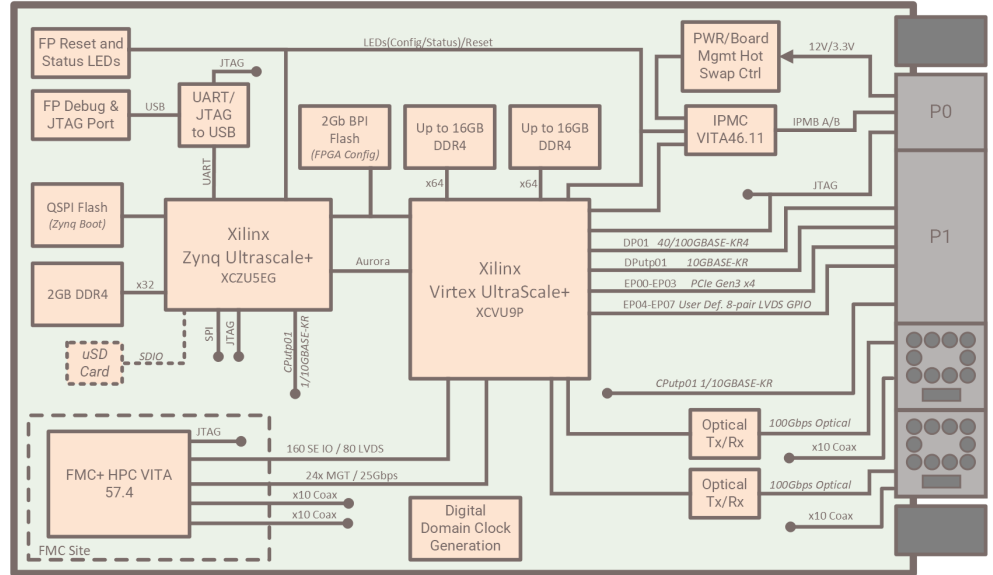
- 0°C to +55°C (Level 1 air-cooled environment with 400 LFM mean airflow)
- -40°C to +70°C (Level D conduction cooled environment at the card thermal interface)

Board Support Package (BSP)

- 40/100G Ethernet with optional RoCEv2 (RDMA over Converged Ethernet) available
- Xilinx PCIe DMA engine included
- 100G Ethernet over optical interface available (optional 100Gbps Aurora)
- Optional MORA, VITA 49.2 Radio Transport (VRT), REDHAWK and GNU Radio support available
- Open source Windows and Linux API
- For VxWorks, please contact Abaco Systems

Block diagram*

* Intended as a reference for basic features and connections and not an actual product layout or design



Ordering information

For available product part numbers, contact your local product expert.

Applications

- Electronic Warfare (EW)
- Signal Intelligence (SIGINT)
- Radar/Sonar
- Software Defined Radio (SDR)
- Multi-Function Communication Systems
- Telecommunications/Broadband Wireless
- Networking and Base Stations Equipment
- Ultra-Wide-Band Satellite Digital Receiver
- Optical and Photonics Instrumentation
- RF and EMI Test Instrumentation
- Biomedical Imaging – Medical Equipment

Xilinx and Zynq are registered trademarks, and UltraScale+ is a trademark of Xilinx, Inc. FireFly is a trademark of Samtec, Inc. PCIe is a trademark of PCI-SIG. ARM is a registered trademark of ARM Limited.



WE INNOVATE. WE DELIVER. YOU SUCCEED.

Americas: 866-OK-ABACO or +1-866-652-2226 | Europe, Africa, Middle East, & Asia Pacific: +44 (0) 1327-359444

abaco.com

Abaco Systems is a global leader in commercial open architecture computing and rugged embedded electronics. With more than 30 years of experience in aerospace & defense, industrial, energy, medical, communications and other critical sectors, Abaco's innovative solutions align with open standards to accelerate customer success.

Abaco Systems is a business unit of AMETEK, Inc., a leading global manufacturer of electronic instruments and electromechanical devices with 2021 sales of more than \$5.5 billion.