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PACIFIC DEFENSE

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DSP3100VP

Versal DSP Plug-in Card



Integrated Multi-Mission Comms/EW/C5ISR Solutions

The DSP3100VP is a high-performance processing module aligned with U.S. Army CMOSS and The Open Group Sensor Open Systems Architecture™, or SOSA™, technical standards, delivering advanced capability for next-generation embedded systems. Built on the AMD Versal™ AI Edge Series Gen 2 device, the DSP3100VP integrates heterogeneous processing, adaptive hardware acceleration, and scalable architecture with deterministic real-time control. This powerful combination enables developers to efficiently deploy complex signal processing, AI, and data-intensive workloads in demanding environments while maintaining the modular interoperability required by modern open standards.

Designed for data-rich, real-time applications, the DSP3100VP features high memory density to support both rapid data processing and local storage, along with ultra-high-speed interfaces including 100G Ethernet and PCIe Gen5 for fast external data movement. The platform is delivered with a comprehensive software and FPGA firmware development kit that simplifies integration and accelerates customer adoption. With the flexibility and performance required for both commercial and defense markets, the DSP3100VP is ideally suited for applications spanning networking, medical imaging, electronic warfare, signal intelligence, cyber security, high-performance parallel computing, and advanced AI/ML workloads.

The DSP3100VP is compliant to the ANSI VITA 48.2 conduction cooling mechanical standard and VITA 47 ECC3 environmental class.

KEY FEATURES

- Built to CMOSS, SOSA™, and OpenVPX™ standards
- 3U VPX form factor
- AMD Versal™ AI Edge Series Gen 2 Adaptive SoC provides next-generation AI engines for efficient AI inference
- Combines heterogeneous processing, acceleration and scalability with real-time control
- 8-core Arm® Cortex®-A78AE application processor
- High memory density of 40 GB LPDDR5
- Fast data transfers to internal memory and external processing blocks
- Backplane support of 100GBASE-KR4, 10GBASE-KR, 1000BASE-BX, and PCIe Gen5 x4 or Gen4 x8
- Targets architecture based on a single security enclave only
- MORA transport layer
- Slot profiles
  - SLT3-PAY-1F1U1S1S1U1U2F1H-14.6.11-14
  - Supports other aperture options
- Conduction cooled

General Characteristics

- AMD Versal AI Edge Series Gen 2 XC2VE3858 device
  - 8-core Arm Cortex-A78AE application processor
  - 10-core Arm Cortex-R52 real-time processor
  - 4-core Arm Mali™-G78AE GPU
  - 144 AI Engine-ML v2 tiles / 2,064 DSP engines
  - 1,188,040 system logic cells / 543,104 LUTs
- Supports other devices from Versal AI Edge and Prime Series Gen 2 – contact Sales for details
- 40GB LPDDR5-6400 of combined PL/PS DRAM w/ provision for 80GB in the future
- 512 MB dual-stacked OSPI flash (Boot and factory restore image)
- 32 GB eMMC (Boot, OS image, and data storage)
- 128 GB UFS 3.1 (data storage)
- Backplane interfaces include
  - Primary Data Plane, 100GBASE-KR4
  - Secondary Data Plane, 1000BASE-BX
  - Control Plane, 10GBASE-KR
  - Expansion Plane, PCIe Gen4 x8 or Gen5 x4
  - Optical interface, dual 100G Ethernet to P2B
  - Dual Maintenance Port, UART
- 100 GbE ML2B real-time bus
- Intelligent Platform Management Interface (IPMI) Tier 2 support
- Trusted Platform Module (TPM 2.0)
- Power 55 W (typical estimate), 90 W (max estimate)
- Weight under 2.0 lbs (approx.)
- Default configuration VITA 48.2 conduction cooled with (1) Style D insert in P2B position and active optical interfaces on MTB1 port
- VITA 47 ECC3 environmental class

Applications

- Avionics, UAS, UAM
- High-performance Mission Computing
- Radar, Signal Intelligence, Electronic Warfare
- Cyber Security Solutions
- Detection and Tracking
- Networking
- Medical Imaging
- AI/ML Applications
- Other SWaP embedded signal processing solutions

INNOVATIVE

DEFENSE & COMMERCIAL SOLUTIONS

Bundled CPU Software (ARM Processors)

- CMOSS MORA software to verify operation in any CMOSS or SOSA chassis
- AMD/Xilinx Versal AI Edge Gen2 Yocto operating system
- CMOSS/SOSA MORA messages software library
- MORA Client example implementation

Software Development Kit

- MORA Software Development Kit
- High level functions for rapid application development
- High level API for MORA device acquisition, control, context, and data
- Project files and development environment
- Example applications with source code

Bundled Firmware (FPGA Image)

- Base Versal AI Edge Series Gen 2 FPGA infrastructure image providing access to all external interfaces
- Example design included

Embedded Development Kit

- Provides the ability to modify all FPGA source code
- Vivado project and build scripts included
- User guide and reference material

CMOSS SOSA Sensor Open Systems Architecture MEMBER OpenVPX

Pacific Defense is designed to support the DoD's disciplined movement to modular open standards and to mirror the way military services address EMS warfare – holistic mission planning and execution. The company's approach inherently enables what it refers to as a rapid prototyping paradigm – embedding a commercial mentality into the defense industry. Products are designed from the outset for modern, AI-driven autonomy and CMOSS and SOSA-aligned hardware and software solutions. This includes state-of-the-art processing that can readily follow the evolution of commercial technology with complete data sharing across networks and platforms.

Headquartered in El Segundo, California, Pacific Defense takes an organic, commercial-minded approach to military-use electromagnetic spectrum technologies, and solutions. Focus areas include autonomous systems, command and control, communications, cyber operations, intelligence collection, and electronic warfare. Spectranetix, Perceptronics, and Spear Research are part of the Pacific Defense family, specializing in highly-advanced RF spectrum technologies, and engineering with innovative AI-backed algorithms.

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