ALPHA DATA

ADM-PA100
Datasheet Revision: 1.0
14th December 2021

AD01429

Applications

- High performance data capture and processing
- CPU offload acceleration
- Low latency networking and analytics
- AI Inference for Data Center or Edge applications
- High Performance Computing
- Industrial vision and control
- Lab-based system prototyping
- Rack level deployments

Board Features

- FMC+ Interface
- GigE Interface
- 1x Firefly™ (x4) Interface
- System Monitor
- Heatsink with optional fan

Summary

The ADM-PA100 is an adaptable PCIe form factor Versal™ ACAP Data Processing Unit suitable for early development and rapid deployment of solutions based on Xilinx™ Versal ACAP VC1902 AI Core device.

The PCIe form factor is suitable for desktop, lab, rack mount and data center deployments in commercial temperature ranges. Additionally, the board can optionally be deployed stand-alone without any reliance on a host CPU. The FMC+ interface on the board allows off-chip support of the many standard and custom interfaces that can be supported by the Versal ACAP through the very wide range of Alpha Data and 3rd Party FMC IO adapters available. Flexible reference designs, allowing customers to access the full IO flexibility of the chip are provided for both the Vivado and Vitis tool chains.

The powerful VC1902 ACAP AI Core device provides a flexible device featuring 400 AI Engine VLIW processor cores capable of 133 INT8 TOPs for Machine Learning or DSP applications, with support for scalar processing on on-chip 2 ARM® Cortex™ A72 Application class CPU cores and 2 ARM Cortex R5 real-time CPU core. These processors are complemented by a large area of 7nm Programmable Logic containing 900k LUTs, almost 2000 DSP tiles and 164Mb of very high bandwidth SRAM suitable for attaching extremely high performance and high efficiency offload acceleration to the ARM and AIE array processors. The device provides, and the board allows, access to a large number of configurable IO pins and Gigabit Transceiver ports which can connect to built-in hard-IP cores for 100G Multi-rate Ethernet, PCIe and DDR4, or can be controlled by custom IO logic in the programmable fabric supporting an incredibly wide range of communication standards and applications.
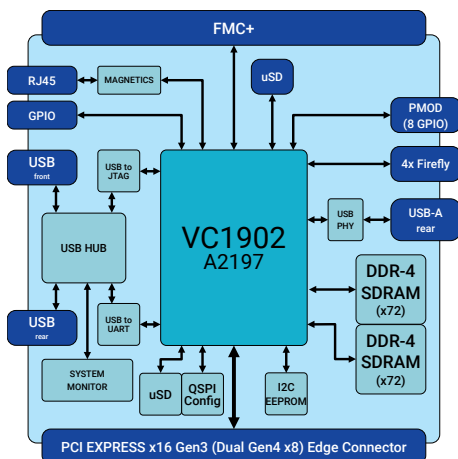
Target Device

Xilinx Versal ACAP
VC1902-2MS (A2197)

LUTs = 899.8k DSPs = 1968
BRAM = 34Mb URAM = 130Mb
AI Engines = 400

400x AI Engines
2x ARM Cortex-A72 MPCore™
2x ARM Cortex-R5 MPCore

Application Data Memory

2x 1G x 72 (8GiB) DDR4-3200

Configuration Memory

x8 QSPI 2Gb storage Flash Memory

Configuration Modes

From onboard Flash or uSD Card
Through USB board management (built-in JTAG)
MCAP Interface for Staged Configuration and Dynamic Function eXchange

Deliverables

ADM-PA100 Board
One Year Warranty
One Year Technical Support

Host Interface

PCI Express Gen3 x16 (or Dual Gen4 x8)

Communications Interfaces

1x Firefly 4x28Gbps - 10/25/40/100G Ethernet, PCIe, Fiber Channel, Infiniband, Aurora

Input/Output Interfaces

FMC+ Interface
24 High-Speed differential Serial Links (up to 28Gbps) and 80 diff pairs (or 160 single ended) GPIO

Other Interfaces

Gigabit Ethernet Interface (RJ45)

USB-A for Application use

Dual USB Configuration Sockets (front and back)

GPIO Interface (8 GPIO)

PMOD Interface (8 GPIO)

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www.alpha-data.com

UK Office
Address: Suite L4A, 160 Dundee Street, Edinburgh, EH11 1DQ, UK
Telephone: +44 131 558 2600
Fax: +44 131 558 2700
email: sales@alpha-data.com

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Support

ARM PS Targeted Reference Design, for host free development.
PCIe based hardware reference designs for Vivado™ with compatible
Windows and Linux driver and host API
Vitis® Board Platform and reference design for ARM PS and AIE
development.

Board Format

PCIe 3/4 Length, full height, Dual Slot, includes front panel
WxHxD = 267.2mm x 126.3mm x 39.9mm
Weight = PCB assembly - 210g: with fans heatsink and covers - 1150g

Environmental Specification

Cooling Option	Fan Fitted	Operating Temperatures		Storage Temperatures	
		Min	Max	Min	Max
Active	YES	0°C	+55°C	-40°C	+85°C
Passive	NO	0°C	+55°C	-40°C	+85°C

Operating Humidity : Up to 95% (non-condensing)

EMC Standards

FCC 47CFR Part 2
EN55022:2010 Equipment ClassB
EN55024:2010
EN60950-1:2006 (+A12:2011)

Ordering Information
Order Code: ADM-PA100(s)(f)

Option	Code	Description of Options
FPGA Configuration	s	/2MS = VC1902-2MS
Fan Fitted	f	BLANK = active (cooling fans) /NF = passive (no fans)
Note		Other options available. Please contact factory for details.