U-C5300

SOSA™ Aligned - GPGPU 3U VPX AI Board

SOSA aligned U-C5300 multi-head GPGPU is the most powerful AI (Artificial Intelligence) enabled 3U VPX GPGPU board, providing remarkable performance in a compact and rugged form factor.

Available with powerful NVIDIA GPU options based on latest ADA architecture, the U-C5300 is ideally suited for AI Delivery, Video Analytics, Image Processing, and many other applications.

The RTX ADA 5000 includes 9,728 CUDA Cores for parallel processing, 340 Tensor Cores for AI inference and 76 RT Ray-Tracing Cores for real time rendering.

POWERED BY NVIDIA

RuggedAI™ *is* Aitech

PRELIMINARY

- Rugged SOSA aligned 3U VPX Form Factor
- NVIDIA® RTX™ ADA GPU Options
  - NVIDIA® RTX™ ADA 5000
    - ADA Architecture
    - 9,728 CUDA® Cores
    - 76 RT Cores
    - 304 Tensor Cores
    - 35.8 TFLOPS (FP32)
    - 16 GB GDDR6
    - 80 W Max Power
  - NVIDIA® RTX™ ADA 2000
    - ADA Architecture
    - 3,072 CUDA® Cores
    - 24 RT Cores
    - 96 Tensor Cores
    - 14.5 TFLOPS (FP32)
    - 8 GB GDDR6
    - 60 W Max Power
- Vulkan, CUDA®, OpenCL, OpenGL, DirectX 12
- Video Output
- PCIe x 4/8/16 Gen4 Host Interface
- OpenVPX Compliant
- Windows®, Linux® Support
- 2LM Option per VITA 48.2
- Conduction and Air Flow Through
- Vibration and Shock Resistant

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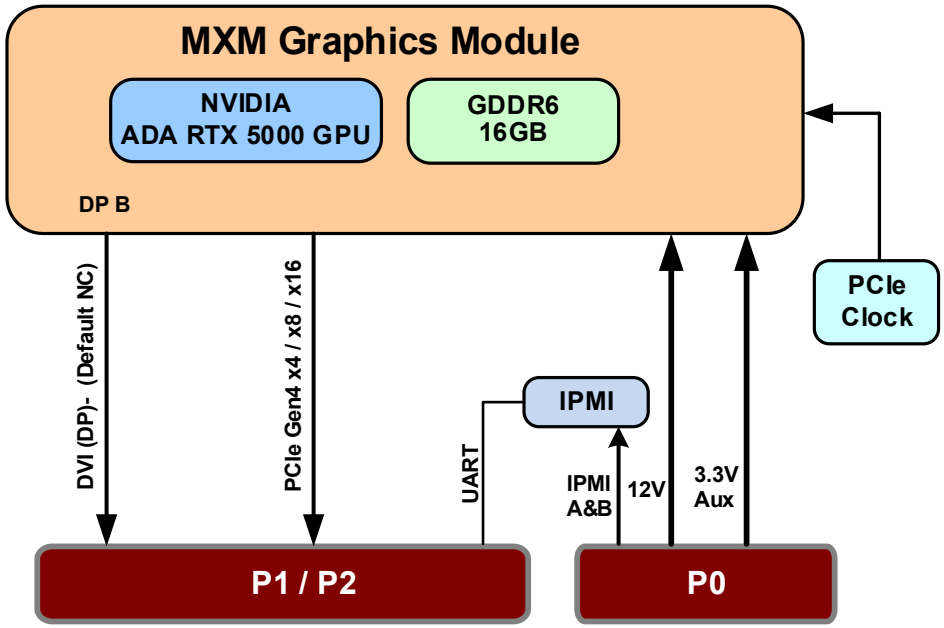
The parallel processing capabilities of today's multi-core GPUs make them ideal for both non-graphics and graphics applications with intensive computation requirements. Aitech's U-C5300 General Purpose AI GPU (GPGPU) board provides these capabilities, as well as high-performance graphics rendering capabilities and multiple video output channels, in a rugged 3U VPX SOSA aligned form factor.

In addition to the increased throughput offered by parallel processing, GPGPU computing also allows the CPU and OS to remain responsive even when the system is under a heavy load, by offloading the intensive operations to the GPU. GPGPU application development can be performed on a standard PC that is equipped with a GPU of the same architecture.

The U-C5300 hosts an MXM GPU module (standardized GPU form factor), and new configurations of the U-C5300 are released as higher-performance MXMs become available. The U-C5300 currently supports the NVIDIA® ADA RTX 5000 and NVIDIA® ADA RTX 2000 GPUs.

The U-C5300 operates as a peripheral board with a compatible x86 VPX host SBC, such as Aitech's U-C8500/1 (11th Gen. Intel® Core i7), C875 (9th Gen. Intel® Xeon®), and U-C8600/1 (Intel® 14th Gen. Core Ultra 7) 3U VPX SBCs. The U-C5300 and the host SBC interconnect over the VPX backplane, via a high speed PCIe Gen4 link of up to 16 lanes.



Note* - See additional details in the “SOSA Profile” section

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Board Architecture

MXM Site	Supports a single MXM 3.1 Type B (RTX ADA 5000) and Type A (RTX ADA 2000) module
MXM GPU	• NVIDIA® RTX ADA 5000 Option ▪ ADA Architecture ▪ 304 Tensor Cores ▪ 16 GB GDDR6 ▪ 35.8 TFLOPS (FP32) ▪ 9,728 CUDA Cores ▪ 576 GB/s memory bandwidth ▪ 76 Ray-Tracing RT cores ▪ 256-bit Memory Interface Width • NVIDIA® RTX ADA 2000 Option ▪ ADA Architecture ▪ 96 Tensor Cores ▪ 8 GB GDDR6 ▪ 14.5 TFLOPS (FP32) ▪ 3,072 CUDA Cores ▪ 256 GB/s memory bandwidth ▪ 24 Ray-Tracing RT cores ▪ 128-bit Memory Interface Width • CUDA, CUDA Compute, OpenCL, OpenGL, DirectX, Vulkan • Dynamic clock frequency - RTX ADA 5000 - Base Clock 930 MHz, Boost Clock 1680 MHz
PCIe Interface	• Compatible with PCIe x16, x8 and x4 Gen3/Gen4 interfaces for connection to host SBC over the VPX backplane • 100 MHz PCIe reference clock generated on-board
SOSA Profile	The PCIe interface supports the following SOSA slot profiles: **SLT3-PAY-1F1U1S1S1U1U2F1H-14.6.11** **3U Payload (Full-P)** • **F2C - Conduction cooled**, 1” pitch (PCIe to P1 expansion plan, P2 depopulated) ○ P3F - PCIe-Gen 4 (x8) ○ MODA3””- 16.6.11-1-0-F2C-(NN)(P3F-N)(N)(NN)[N]<N> • **F8H - Air-Flow Through cooled**, 1.5” pitch (PCIe to P1 expansion plan, P2 depopulated) ○ P3F - PCIe-Gen 4 (x8) ○ MODA3””- 16.6.11-1-0-F8H-(NN)(P3F-N)(N)(NN)[N]<N> **SLT3-PAY-1F1U1S1S1U1U2F1H-14.6.13** **3U Payload (Half-P)** • **F2C - Conduction cooled**, 1” pitch (PCIe to P1 expansion plan, P2B depopulated) ○ P3D - PCIe-Gen 4 (x16) ○ MODA3””- 16.6.13-1-0-F2C-(NN)(P3D-N)(N)(N)[N]<N> • **F8H – Air-Flow Through cooled**, 1.5” pitch (PCIe to P1 expansion plan, P2B depopulated) ○ P3D - PCIe-Gen 4 (x16) ○ MODA3””- 16.6.13-1-0-F8H-(NN)(P3D-N)(N)(N)[N]<N>

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Variants

	Variants				
	A0	**A1**	**A2**	**A3**	**A4**
SOSA Profile	14.6.11		14.6.13		Custom
SOSA Profile Description	3U Payload (Full-P)		3U Payload (Half-P)		3U Payload Custom
AMPS Depth, Cooling, Pitch dash option	F2C	F8H	F2C	F8H	NA
Cooling	Conduction	Air-Flow Through(2)	Conduction	Air-Flow Through(2)	Conduction
Pitch [inch]	1	1.5	1	1.5	1
PCIe [lanes]	4		8		16
Video Outputs	NA		NA		DVI(1)

Notes:
(1) DVI/HDMI - up to 1600x1200 @ 60 Hz
(2) Contact an Aitech representative for more information

Software

Operating System Support	Windows and Linux
Drivers	Supported by NVIDIA driver packages
GPGPU Development Tools	NVIDIA's CUDA toolkit supports GPGPU application development

Mechanical

	Form Factor & Dimensions (1)	**Weight**
Conduction-Cooled 2LM	3U VPX REDI 2LM (Two Level Maintenance) per ANSI/VITA 48.2	<1,000 g (2.2 lbs.)
Air Flow Through Cooled(2)	3U VPX REDI per ANSI/VITA 48.8	<1,300 g (2.86 lbs.)

Notes:
(1) Pitch varies according to the ordered variant
(2) Contact an Aitech representative for more information

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Power

U-C5300 MXM	Power Consumption
NVIDIA ADA RTX 2000	60 W
NVIDIA ADA RTX 5000	80 W

Environmental

Specs per VITA 47	Air Flow Through Cooled		Conduction-Cooled	
	Rugged	Military	Rugged	Military
Operating Temp.	AC3 (-40 to +70 ºC) (2)	AC4 (-40 to +85 ºC) (1,2)	CC3 (-40 to +70 ºC) (3)	CC4 (-40 to +85 ºC) (1,3)
Non-Operating Temp.	C3 (-50 to +100 ºC)	C4 (-55 to +125 ºC)	C3 (-50 to +100 ºC)	C4 (-55 to +125 ºC)
Vibration	V2	V2	V3	V3
Operating Shock	OS1	OS1	OS2	OS2
Altitude	35,000 ft.	70,000 ft.	35,000 ft.	70,000 ft.
Relative Humidity (4)	0 - 95% with Acrylic (Standard),			
Conformal Coating	0 - 100% with Urethane (Optional)			

Notes:
(1) -55 ºC available, contact an Aitech representative for more information
(2) Operating ambient air temperature (with sufficient airflow)
(3) Operating card edge temperature
(4) Non-condensing

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Ordering Information

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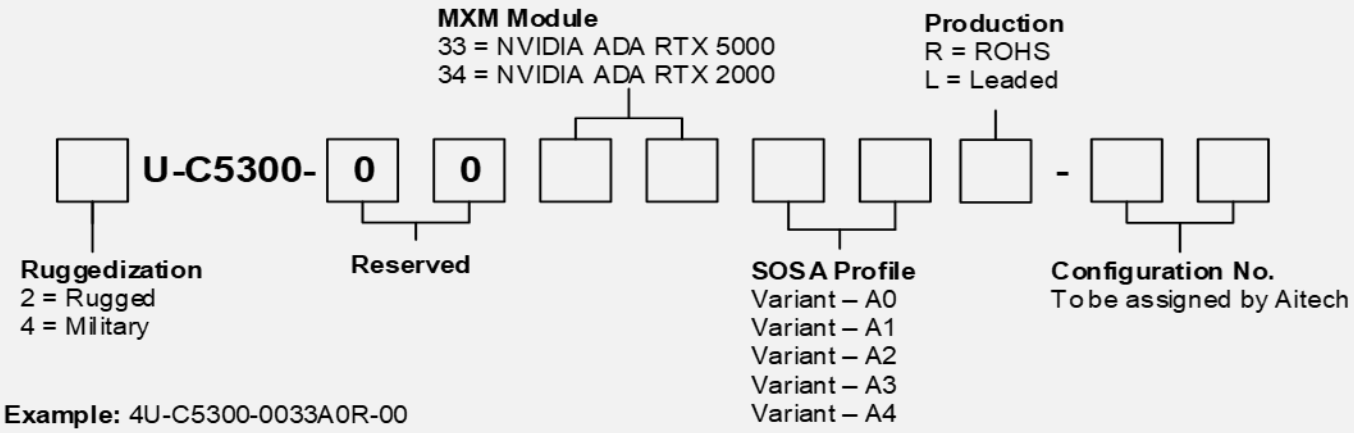

Example: 4U-C5300-0033A0R-00

Optional Accessories

TMU-C5300	Rear Transition Module (RTM) providing convenient access to U-C5300 I/O interfaces via standard connectors. Supports both air and conduction-cooled U-C5300 when installed in a compatible system. See the TMU-5300 datasheet for more information.

Contact Aitech

Contact your Aitech sales representative for additional product information, and for inquiries regarding customized configura tions of the U-C5300 and additional software support.

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