

# A230 Vortex

Rugged GPGPU Fanless AI Supercomputer



The A230 Vortex stands out as the most powerful Rugged GPGPU AI supercomputer, ideally suited for distributed systems, available with the powerful NVIDIA Jetson AGX Orin Industrial System-on-Module.

Its Ampere GPU features up to 2048 CUDA cores and 64 Tensor cores, delivering up to 248 TOPS and ensuring remarkable energy efficiency for AI-based local processing right alongside your sensors. In addition, the system includes two dedicated NVIDIA Deep-Learning Accelerator (NVDLA) engines, tailored for deep learning applications.

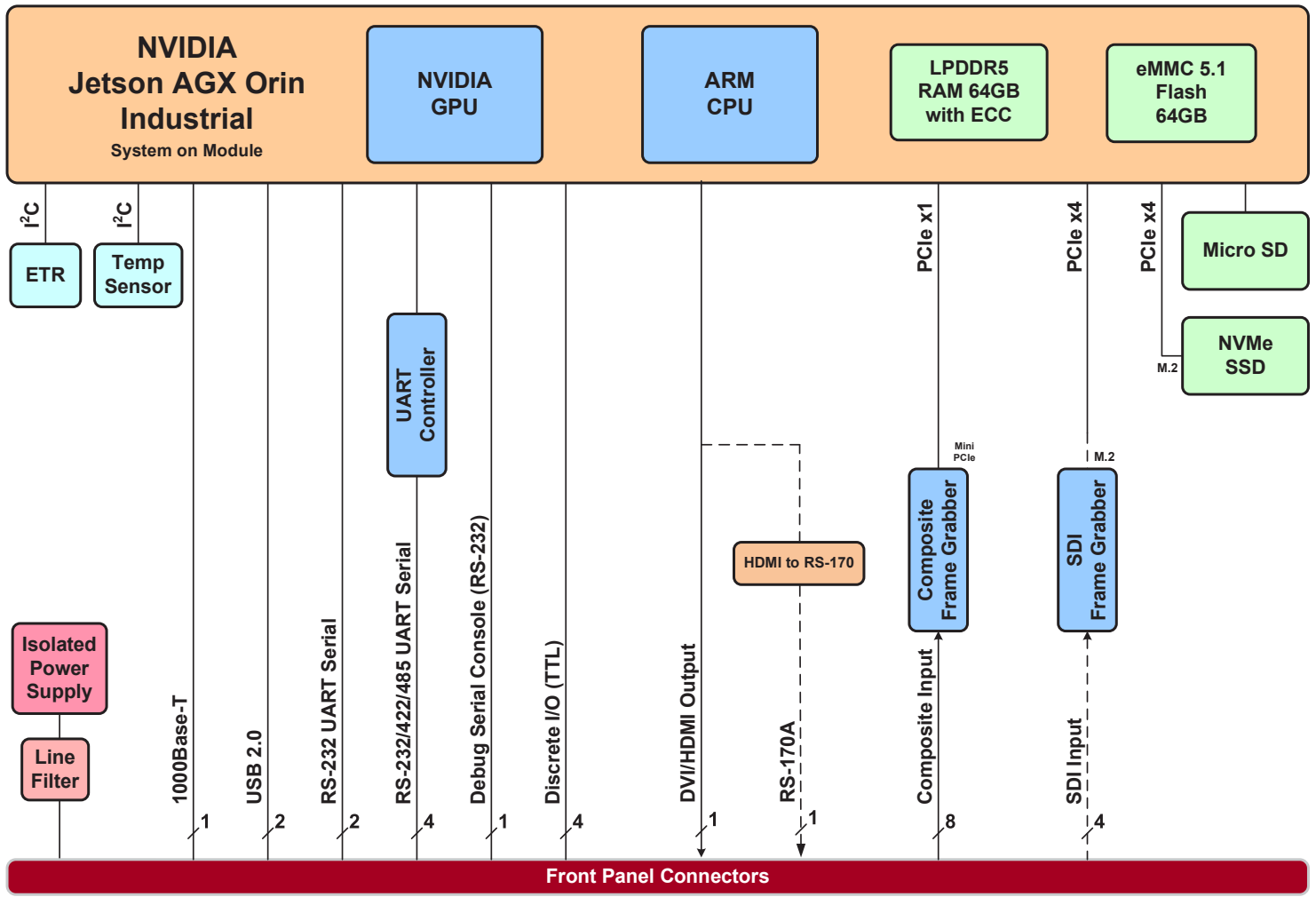
With its compact size, the A230 Vortex sets the standard as the most advanced solution for AI, deep learning, and video and signal processing in next generation of autonomous vehicles, surveillance and targeting systems, electronic warfare (EW) systems, and more.

POWERED BY



**RuggedAI™ is Aitech**

- **SWaP Optimized Rugged AI Supercomputer**
- **Small Form Factor**
- **NVIDIA® Jetson™ AGX Orin Industrial System-on-Module 64GB RAM with ECC**
  - ▶ Ampere™ Architecture GPU 2048 CUDA® Cores
  - ▶ 12-Core ARM v8.2 64-bit CPU
  - ▶ AI performance 248 TOPS
  - ▶ H.264/H.265 Hardware Encoder
- **Cold Plate cooling**
- **NVMe SSD**
- **Micro SD Card**
- **64 GB LPDDR5 with ECC**
- **Video Capture**
  - ▶ SDI (SD/HD)  
4 channels available simultaneously
  - ▶ Composite (RS-170A [NTSC]/PAL)  
8 channels available simultaneously
- **I/O**
  - ▶ Gigabit Ethernet
  - ▶ Discretes
  - ▶ USB
  - ▶ DVI/HDMI Out
  - ▶ UART Serial
  - ▶ RS-170A Out
- **CUDA®, OpenGL, OpenGL ES, Vulkan**
- **Low Power Consumption**
- **Environmentally Sealed (IP66)**



A230 Block Diagram

### System Architecture

<b>System on Module</b>	<ul style="list-style-type: none"> <li>NVIDIA Jetson AGX Orin Industrial - 64GB RAM with ECC</li> </ul>
<b>GPU</b>	<ul style="list-style-type: none"> <li>NVIDIA Ampere GPU Architecture</li> <li>2048 CUDA cores</li> <li>AI performance 248 TOPS</li> <li>CUDA</li> <li>OpenGL</li> <li>OpenGL ES</li> <li>Vulkan</li> </ul>
<b>CPU</b>	<ul style="list-style-type: none"> <li>ARMv8.2 (64-bit) heterogeneous multi-processing (HMP) CPU</li> <li>12-core NVIDIA ARM® Cortex A78AE v8.2 64-bit CPU 3MB L2 + 6MB L3</li> <li>Operates at up to 1.2 GHz (depends on power mode)</li> </ul>
<b>System Resources</b>	<ul style="list-style-type: none"> <li>Multi-standard video/JPEG decoder/encoder, hardware encoding for H.264/H.265</li> <li>Dynamic voltage and frequency scaling</li> <li>Temperature sensors</li> <li>Elapsed time recorder</li> <li>Status indicator LED</li> </ul>

## Memory Resources

<b>RAM</b>	64 GB LPDDR5 with ECC, operates at up to 204.8GB/s (depending on power mode), 256-bit interface
<b>eMMC</b>	64 GB eMMC 5.1 (boot source)
<b>NVMe SSD</b>	Optional NVMe SSD (for standard options, see the <i>Ordering Information</i> section. Additional options may be available per customer request. Contact an Aitech representative for more info)
<b>Micro SD Card</b>	Optional micro SD card (for standard options, see the <i>Ordering Information</i> section. Additional options may be available per customer request. Contact an Aitech representative for more info)

## I/O

I/O Variant	00	01	02	03
<b>Composite Input</b> RS-170A (NTSC)/PAL, supports simultaneous capture of all channels at full frame rates	–	8	8	8
<b>SDI Input</b> 480/60i, 576/50i, 720/60p, 1080/60i, 1080/30p, supports simultaneous capture of all channels at full frame rates	–	–	4	–
<b>RS-170A Output</b>	–	–	–	1
<b>Gigabit Ethernet (10/100/1000Base-T)</b>			1	
<b>DVI (single-link) / HDMI Output</b> Supports resolutions up to 1920x1080 [60p]			1	–
<b>USB 2.0</b>			2	
<b>Serial Ports (RS-232 UART)</b>			2	

## I/O

<b>Serial Ports (RS-232/422/485 UART)</b> Software configurable as RS-232/422/485	4
<b>Debug Serial Console (RS-232 UART)</b>	1
<b>Discrete I/O (Single-Ended, TTL)</b>	4

## Software

<b>Operating System</b>	Linux OS pre-installed – L4T (Linux for Tegra), a lightly modified Ubuntu-based distribution
<b>Drivers</b>	Video capture drivers and sample applications pre-installed, in variants equipped with optional frame grabber(s)

## Mechanical

<b>Cooling</b>	Cold Plate
<b>Dimensions (L x W x H)</b>	250 mm x 95 mm x 200 mm
<b>Weight</b>	< 4 kg

## Power

<b>Input Power</b>	<ul style="list-style-type: none"> <li>Wide input voltage range: 22 – 33 V<sub>DC</sub> steady state operation</li> <li>Input reverse polarity protection</li> <li>EMI/RFI input filter</li> <li>On-board supplies isolated from external supply</li> <li>MIL-STD-704A and MIL-STD-1275D compliant (no hold-up)</li> </ul>
<b>Power Consumption</b>	<ul style="list-style-type: none"> <li>For AGX Orin Industrial SoM</li> <li>15W - 60W</li> <li>Users can create custom presets, specifying clocks and online cores</li> <li>The total power consumption depends on system configuration and expansion options</li> </ul>

## Environmental

<b>Operating Temp.</b>	-40 to +55 °C @ cold plate
<b>Non-Operating Temp.</b>	-40 to +80 °C
<b>Transportation Vibration</b>	MIL-STD-810H, Method 514.8, Procedure 1, Category 7 – General Exposure
<b>Operating Vibration</b>	VITA 47 Class V2
<b>Operating Shock</b>	MIL-STD-810H, Method 516.8, Procedure I, 20 g/11 ms
<b>Acceleration</b>	MIL-STD-810H, Method 513.8, Procedure II, 7 g all axes
<b>Altitude</b>	MIL-STD-810H, Method 500.6, Procedure II, -1,500 to +60,000 ft. (1) (@+25°C Max.)
<b>Relative Humidity</b>	MIL-STD-810H, Method 507.6, Procedure II
<b>Ingress Protection</b>	IPX6(2)
<b>Blowing Dust</b>	MIL-STD-810H, Method 510.7, Procedure I
<b>Salt Fog</b>	MIL-STD-810H, Method 509.7
<b>EMI/RFI</b>	Designed for MIL-STD-461G

Notes: (1) Depending on temperature and system power dissipation  
 (2) With appropriate connections to system I/O and power connectors. Mating connectors and cables should be sealed as well

## Optional Accessories

<b>TCA230-00-SK</b>	Starter Kit for I/O Variants 00, 01, and 02: External Power Supply, J1 Power Cable, J2 I/O Cable with Standard I/O Connectors
<b>MCS230-1-00</b>	Mating Connectors Set
<b>MCS230-1-00_BR</b>	Bronze Mating Connectors Set



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