

# A179 – Lightning

## Rugged Fan-less Xavier™ NX AI Supercomputer



The A179 Lightning is the smallest and most powerful Rugged fan-less AI supercomputer based on NVIDIA Xavier™ NX, brings AI performance to the edge, available with the powerful NVIDIA Jetson Xavier™ NX System-on-Module.

Its Volta GPU with 384 CUDA cores and 48 Tensor cores reaches 21 TOPS INT8 at a remarkable level of energy efficiency, providing all the power needed for AI-based local processing right where you need it, next to your sensors. Two dedicated NVDLA (NVIDIA Deep-Learning Accelerator) engines provide an interface for deep learning applications.

With its compact SFF size, the A179 Lightning is the most advanced solution for AI, deep learning, and video and signal processing for the next generation of autonomous vehicles, surveillance and targeting systems, EW systems, drones, wearable and many other applications.

POWERED BY



**RuggedAI™ is Aitech**

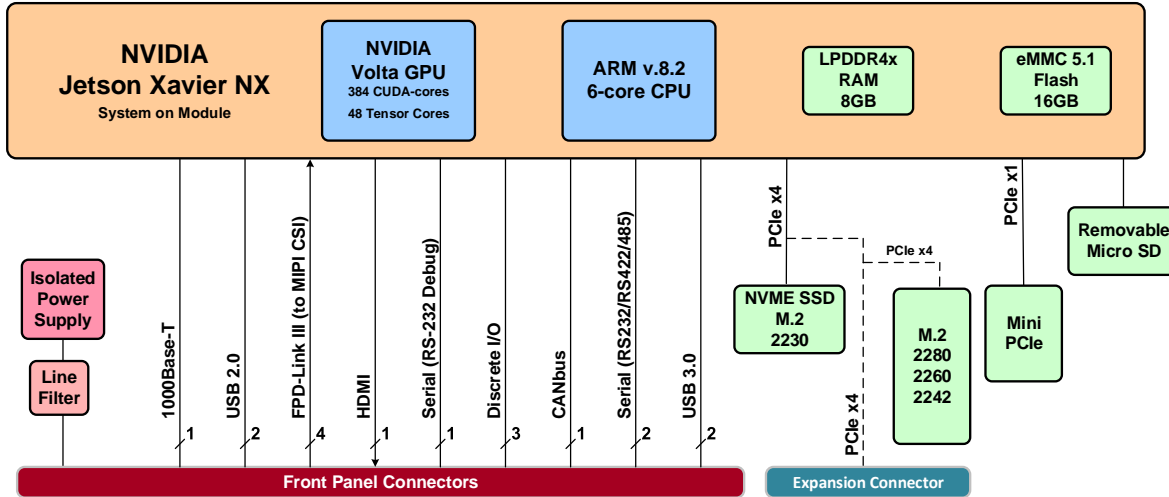
- SWaP Optimized Rugged AI Supercomputer
- Ultra-Small Form Factor
- NVIDIA® Jetson Xavier™ NX System-on-Module
  - ▶ Volta™ Architecture GPU w/384 CUDA® Cores
  - ▶ 48 Tensor cores
  - ▶ 6-Core ARM v8.2 64-bit CPU
  - ▶ 21 TOPS (Tera Operations Per Second, INT8)
  - ▶ H.264/H.265 Hardware Encoder/Decoder
  - ▶ Best Available Performance per Watt – 1050 GOPS/W INT8
- NVME SSD
- Removable Micro SD Card
- 8 GB LPDDR4x
- Video Capture
  - ▶ SDI (SD/HD)
  - ▶ Composite (NTSC/PAL)  
8 channels available simultaneously
  - ▶ 4 FPD-Link™ III (to MIPI CSI) camera inputs
- I/O
  - ▶ Gigabit Ethernet
  - ▶ USB 3.0 & 2.0
  - ▶ Discretes
  - ▶ DVI/HDMI Out
  - ▶ CANbus
  - ▶ UART Serial
- Vulkan, CUDA®, OpenGL, OpenGL ES
- Low Power Consumption
- Environmentally Sealed (IP67)

PRELIMINARY



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## Rugged Fan-less Xavier™ NX AI Supercomputer

### System Architecture

<b>System on Module</b>	NVIDIA Jetson Xavier™ NX
<b>GPU</b>	<ul style="list-style-type: none"><li>• NVIDIA Volta GPU Architecture</li><li>• 384 CUDA cores</li><li>• 48 Tensor cores</li><li>• 21 TOPS INT8 (Tera Operations Per Second for Integer 8-bit)</li><li>• Vulkan</li><li>• OpenGL</li><li>• OpenGL ES</li><li>• CUDA</li></ul>
<b>CPU</b>	<p>ARMv8.2 (64-bit) heterogeneous multi-processing (HMP) CPU</p> <ul style="list-style-type: none"><li>• 6-core NVIDIA Carmel ARM@v8.2 64-bit CPU</li><li>• 6 MB L2 + 4 MB L3</li><li>• Operates at up to 1.9GHz (depends on power mode)</li></ul>
<b>Expansion Options</b>	<p>Main board accommodates up to two optional expansion modules (via factory configuration), such as:</p> <ul style="list-style-type: none"><li>• Optional I/O expansion modules (for example: SDI Frame Grabber – standard I/O expansion module options are determined by system I/O Variant)</li><li>• Optional NVMe SSD</li></ul> <p>Additional I/O expansion module options and NVMe SSD options may be available per customer request, contact an Aitech representative for more info</p>
<b>System Resources</b>	<ul style="list-style-type: none"><li>• Multi-standard Video/JPEG Decoder/Encoder, HW Encoding for H.264/H.265</li><li>• Dynamic voltage and frequency scaling</li><li>• Temperature Sensors</li><li>• Status Indicator LED</li></ul>

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### Memory Resources

<b>RAM</b>	8 GB LPDDR4x, operates at up to 51.2 GB/s (depends on power mode), 128-bit interface
<b>eMMC</b>	16 GB eMMC 5.1 (boot source)
<b>NVMe SSD</b>	Optional NVMe SSD (standard options are listed in <i>Ordering Information</i> below, additional options may be available per customer request, contact an Aitech representative for more info)
<b>Removable Micro SD Card</b>	Optional removable Micro SD card (standard options are listed in <i>Ordering Information</i> below, additional options may be available per customer request, contact an Aitech representative for more info)

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I/O	I/O Variant			
	00	01	02	03
<b>Composite Input</b> NTSC/PAL, supports simultaneous capture of all channels at full frame rates	–	8	–	–
<b>SDI Input</b> 480/60i, 576/50i, 720/60p, 1080/60i, 1080/30p,	–	–	1	–
<b>USB 3.0</b>		–		2
<b>FPD-Link III (to MIPI CSI) camera inputs</b>		–		4
<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 Debug)</b>			1	
<b>Serial Ports (RS-232/422/485 UART)</b> Software configurable as RS-232/422/485			2	
<b>Discrete I/O (Single-Ended)</b>			3	
<b>CANbus</b>			1	

### Software

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

### Mechanical

<b>Dimensions (L x W x H)</b>	100 mm x 55 mm x 100 mm [3.9" x 2.2" x 3.9"]
<b>Weight</b>	< 650 gr [1.4 lbs.]

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### Power

<b>Input Power</b>	<ul style="list-style-type: none"><li>• Wide input voltage range: 11 – 34 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-704 and MIL-STD-1275 compliant (no hold-up)</li></ul>
<b>Power Consumption</b>	<ul style="list-style-type: none"><li>• Two main different power preset modes for the NVIDIA Xavier™ NX:<ul style="list-style-type: none"><li>▪ 10 W</li><li>▪ 15 W (default)</li></ul></li><li>• Users can create custom presets, specifying clocks and online cores</li><li>• Total power consumption depends on system configuration and expansion options</li></ul>

### Environmental

<b>Operating Temp.</b>	<b>Min.</b>	-25 °C
	<b>Max.</b>	+55 °C
<b>Non-Operating Temp.</b>		-40 to +80 °C
<b>Vibration</b>		V2 per VITA 47
<b>Operating Shock</b>		OS2 per VITA 47
<b>Altitude</b>		-1,500 to +60,000 ft. <sup>(1)</sup>
<b>Relative Humidity</b>		0 – 100%
<b>Ingress Protection</b>		IP67 <sup>(2)</sup>
<b>Rain</b>		MIL-STD-810H, Method 506.6, Procedure III
<b>Dust</b>		MIL-STD-810H, Method 510.7, Procedure I & II
<b>Salt Fog</b>		MIL-STD-810H, Method 509.7
<b>Bench Handling</b>		MIL-STD-810H, Method 516.8, Procedure VI
<b>Fungus</b>		MIL-STD-810H, Method 508.8
<b>EMI/RFI</b>		Designed for MIL-STD-461

Notes: (1) Depending on temperature and system power dissipation  
(2) With appropriate connections to system I/O and power connectors

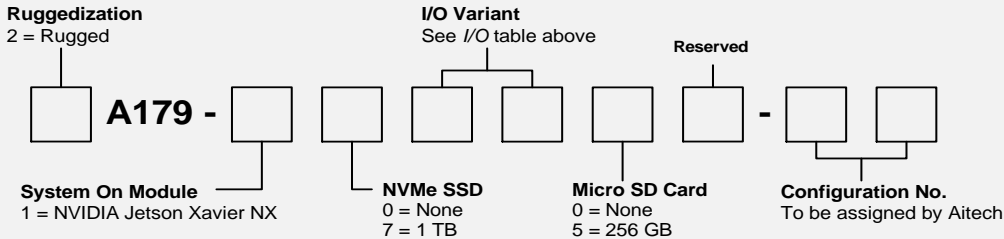
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## Rugged Fan-less Xavier™ NX AI Supercomputer

### Ordering Information



Example: 2A179-170000-00

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### Optional Accessories

<b>TCA179-00-SK</b>	Starter Kit for I/O Variants 00, 01, and 02: External Power Supply, Power Cable, I/O Cables with Standard I/O Connectors
<b>TCA179-00-SK-HS</b>	Starter Kit for I/O Variant 03: External Power Supply, Power Cable, I/O Cables with Standard I/O Connectors
<b>MCS179-1-00</b>	Mating Connectors for I/O Variants 00, 01, and 02: Power and I/O
<b>MCS179-3-00</b>	Mating Connectors for I/O Variant 03: Power and I/O



### Contact Aitech

Contact your Aitech sales representative for additional product information, and for inquiries regarding customized configurations of the A179 and additional software support.

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