

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)

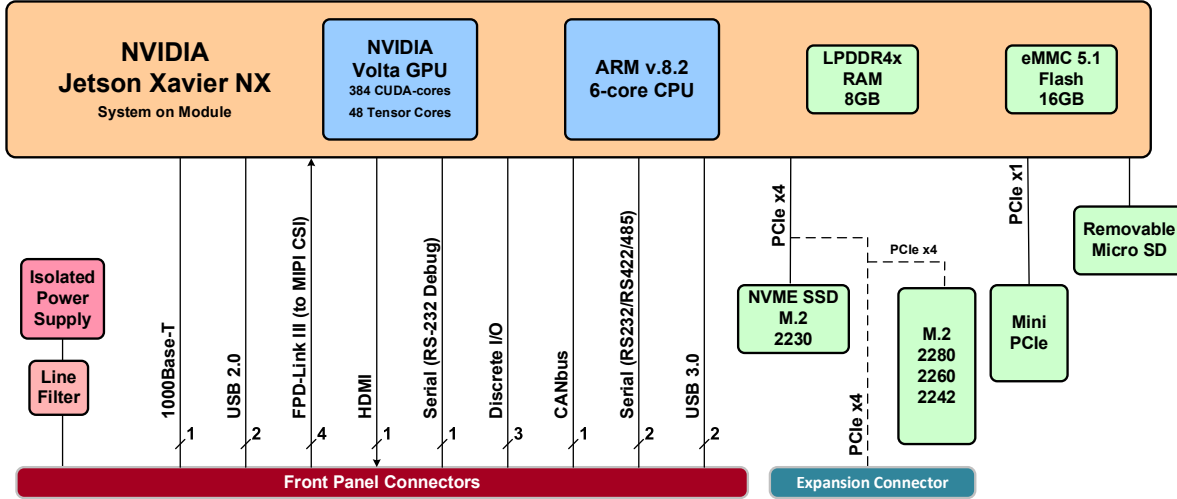
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www.aitechsystems.com

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System Architecture

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

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Memory Resources

RAM	8 GB LPDDR4x, operates at up to 51.2 GB/s (depends on power mode), 128-bit interface
eMMC	16 GB eMMC 5.1 (boot source)
NVMe SSD	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)
Removable Micro SD Card	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
Composite Input NTSC/PAL, supports simultaneous capture of all channels at full frame rates	–	8	–	–
SDI Input 480/60i, 576/50i, 720/60p, 1080/60i, 1080/30p,	–	–	1	–
USB 3.0		–		2
FPD-Link III (to MIPI SCI) camera inputs		–		4
Gigabit Ethernet (10/100/1000Base-T)			1	
DVI (single-link) / HDMI Output Supports resolutions up to 1920x1080 [60p]			1	
USB 2.0			2	
Serial Ports (RS-232 UART Debug)			1	
Serial Ports (RS-232/422/485 UART) Software configurable as RS-232/422/485			2	
Discrete I/O (Single-Ended)			3	
CANbus			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

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

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Power

Input Power	<ul style="list-style-type: none">• Wide input voltage range: 11 – 34 V_{DC} steady state operation• Input reverse polarity protection• EMI/RFI input filter• On-board supplies isolated from external supply• MIL-STD-704 and MIL-STD-1275 compliant (no hold-up)
Power Consumption	<ul style="list-style-type: none">• Two main different power preset modes for the NVIDIA Xavier™ NX:<ul style="list-style-type: none">▪ 10W▪ 15W (default)• Users can create custom presets, specifying clocks and online cores• Total power consumption depends on system configuration and expansion options

Environmental

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

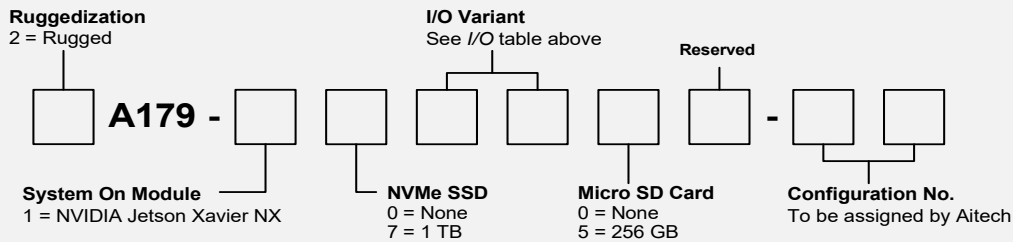
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Ordering Information



Example: 2A179-170000-00

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Optional Accessories

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