

A176 – Cyclone

GPGPU Fanless Small FF RediBuilt™ Supercomputer



Embedded Computing
without Compromise



The A176 Cyclone is the smallest and most powerful Rugged-GPGPU, ideally suited for distributed systems.

Its 256 CUDA cores reach 1 TFLOPS at a remarkable level of energy efficiency, providing all the power you need for local processing right where you need it, next to your sensors.

With its compact size, the A176 Cyclone is the most advanced solution for video and signal processing for the next generation of autonomous vehicles, surveillance and targeting systems, EW systems, and many other applications.

Rugged **GPGPU** is Aitech

- SWaP Optimized Rugged HPEC
- Ultra Small Form Factor – 129 mm [5.1"] square, < 1 kg [2.2 lbs.]
- NVIDIA® Jetson™ TX1 System on Module
 - ▶ NVIDIA Maxwell™ Architecture GPU, with 256 CUDA cores
 - ▶ ARM® Cortex® A57 Quad-Core CPU
 - ▶ 1 TFLOPS
 - ▶ H.264/H.265 HW Encoder
 - ▶ Best Available Performance per Watt – 60 GFLOPS/W
- SATA SSD with Quick Erase & Secure Erase
- 4 GB LPDDR4
- Video Capture
 - ▶ SDI (SD/HD) w/dedicated H.264 encoder
 - ▶ Composite (RS-170A [NTSC]/PAL), 8 channels available simultaneously
- I/O
 - ▶ Gigabit Ethernet
 - ▶ UART Serial
 - ▶ USB 2.0
 - ▶ Discretes
 - ▶ DVI/HDMI Output
 - ▶ Composite Input
 - ▶ SDI Input
- CUDA, OpenGL, OpenGL ES, EGL
- Low Power Consumption
- Development Platforms Available



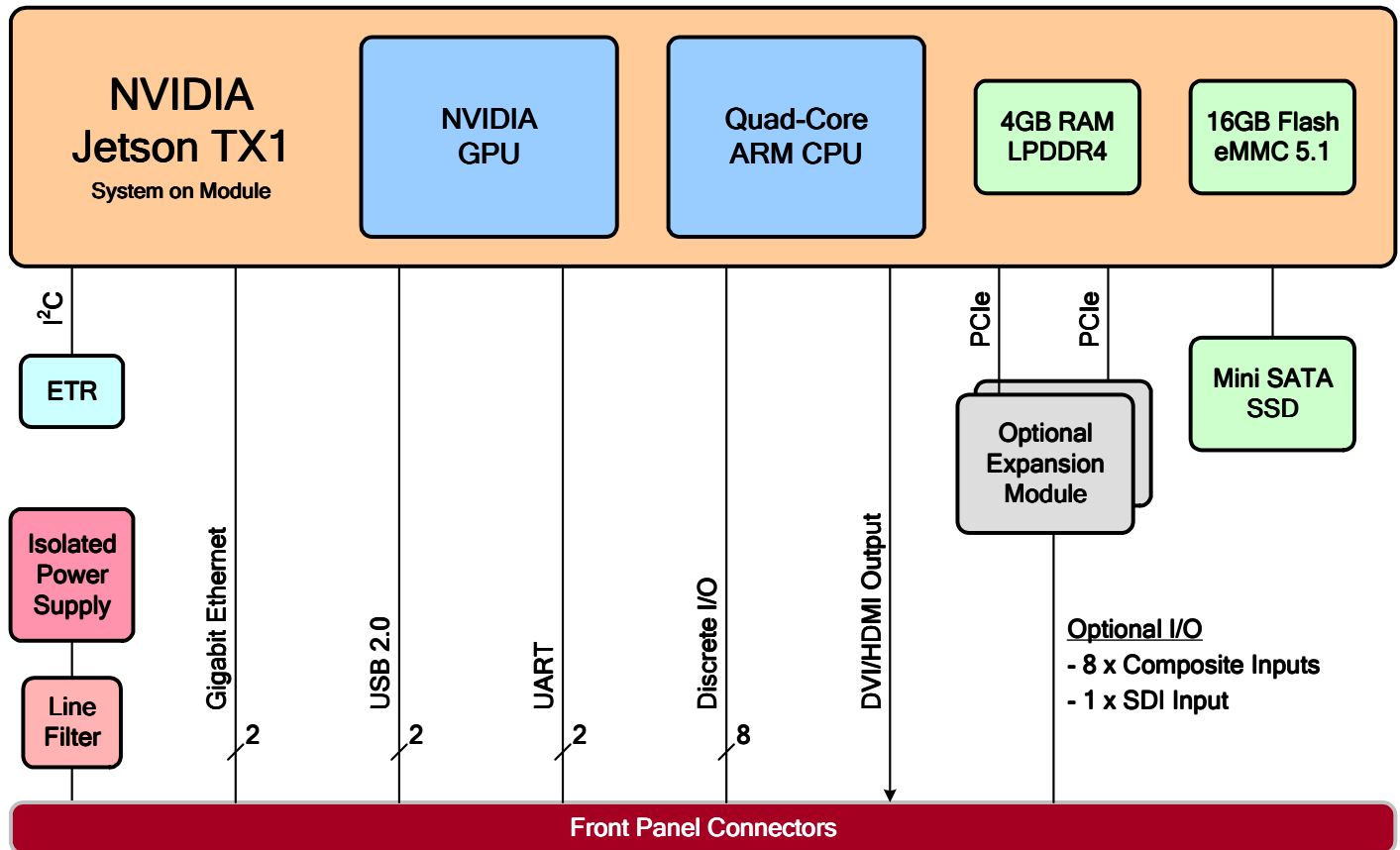
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System Architecture

System on Module	NVIDIA Jetson TX1
GPU	<ul style="list-style-type: none">• NVIDIA Maxwell GPU Architecture• 256 Shaders/CUDA cores• OpenGL ES Shader Performance up to 1024 GFLOPS (fp16)• CUDA 7.0• OpenGL 4.5• OpenGL ES 3.1• Two independent display controllers
CPU	<ul style="list-style-type: none">• ARM® Cortex® A57 Quad-Core CPU @ 1.73 GHz• L1 Cache: 48 KB instruction, 32 KB data per core; L2 Cache: 2 MB Unified
Expansion Options	<p>Main board accommodates up to two optional I/O expansion modules. Available options include:</p> <ul style="list-style-type: none">• Composite Frame Grabber• SDI Frame Grabber <p>Included expansion modules are determined by system I/O Variant, see the I/O section below for details (additional 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• Elapsed Time Recorder• Status Indicator LED

Memory Resources

RAM	4 GB LPDDR4 in dual channels operates at 3200 MT/s
eMMC	16 GB eMMC 5.1 (boot source)
SATA SSD	32 GB Mini SATA SSD – SLC Flash with Quick Erase and Secure Erase support (additional options may be available per customer request, contact an Aitech representative for more information)

Security

- HW acceleration for AES 128/192/256 encryption and decryption
- HW acceleration for AES CMAC, SHA-1, and SHA-256 algorithms
- 2048-bit RSA HW
- HW Random Number Generator (RNG) SP800-90
- Quick Erase and Secure Erase SSD support

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I/O		I/O Variant			
		00	01	02	03
Expansion Card Options	Composite Frame Grabber	–	✓	–	✓
	SDI Frame Grabber	–	–	✓	✓
Composite Input RS-170A (NTSC)/PAL, supports simultaneous capture of all channels at full frame rates		–	8	–	8
SDI Input 480/60i, 576/50i, 720/60p, 1080/60i, 1080/30p, dedicated H.264 encoder		–	–	1	1
DVI (single-link) / HDMI Output		1			
USB 2.0		2			
Gigabit Ethernet (10/100/1000Base-T)		2			
Serial Ports (RS-232 UART)		2			
Discrete I/O (Single-Ended)		8			

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	127 x 129 x 49 mm [5.0 x 5.1 x 1.93"]
Weight	< 1 kg [2.2 lbs.]

Power

Input Power	<ul style="list-style-type: none">• Wide input voltage range: 11 – 36 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">• ≤5W idle• 8 – 10W under typical CUDA load• 17W when System on Module is fully utilized Total power consumption depends on system configuration and expansion options

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Environmental

Operating Temp.	-40 to +55 °C
Non-Operating Temp.	-55 to +105 °C
Vibration	V3 per VITA 47
Operating Shock	OS2 per VITA 47
Altitude	-1,500 to +60,000 ft. ⁽¹⁾
Relative Humidity	0 – 100%
Ingress Protection	IP65
Rain	MIL-STD-810F, Method 506.4, Procedure III
Dust	MIL-STD-810F, Method 510.4, Procedure I & II
Salt Fog	MIL-STD-810F, Method 509.4
Bench Handling	MIL-STD-810F, Method 516.5, Procedure VI
Fungus	Fungus Resistant
EMI/RFI	MIL-STD-461

Notes: (1) Depending on temperature and system power dissipation

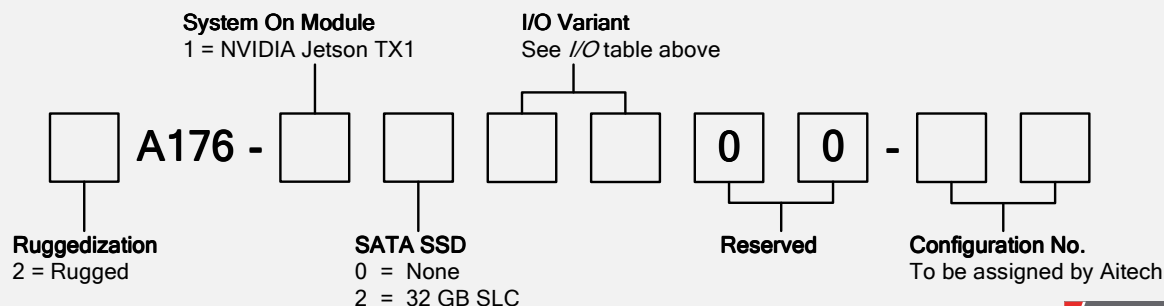
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Ordering Information



Example: 2A176-120300-00

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Optional Accessories

MCS176-1-00 Set of Front Panel Mating Connectors

Starter Kit

- External Power Supply
- J1 Power Cable
- J2 I/O Cable



Development Platform

Development platforms are available as an option, which include:

- EV176 – A176 Evaluation System
- I/O Cables and Power Supply
- Software installed/configured by Aitech – latest available OS release, development tools, CUDA examples

Contact your Aitech representative for additional information



Contact Aitech

Contact your Aitech sales representative for additional product information, and for inquiries regarding customized configurations of the A176 and additional software support.

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