A193

GPGPU Based Rugged RediBuilt™ HPEC

Aitech
Embedded Computing *without* Compromise

A193 GPGPU subsystem is a true rugged COTS High Performance Embedded Computer (HPEC). Assembled, tested, and qualified, the A193's integrated Intel® Xeon® SBC and NVIDIA GPGPU provides an out-of-the-box solution to meet many of today's military and airborne computing requirements. Designed using proven Aitech technology, this GPGPU subsystem is a fully integrated product, requiring no NRE or any additional development. Just set the Ethernet address, load your application and go...!

Rugged GPGPU is Aitech

- **GPGPU Based Rugged High Performance Embedded Computer (HPEC)**
- **8th Gen E-2176M Intel® Xeon® CPU, 6 Cores/12Threads @ 2.7 GHz**
- **NVIDIA® GeForce® GTX 1050 GPU**
  - **Pascal Architecture**
  - **1.73 TFLOPS**
  - **640 CUDA Cores @ 1354 MHz**
  - **4 GB GDDR5**
  - **CUDA, PhysX, OpenCL, OpenGL, DirectX 12**
- **I/O**
  - **Gigabit Ethernet**
  - **UART Serial**
  - **USB 2.0**
  - **DVI/RGB Outputs**
- **Up to 32 GB DDR4 w/ECC**
- **Up to 1 TB On-board SSD**
- **Windows®, Linux® Support**
- **Fully Integrated and Ready to Use**
- **D38999 I/O and Power Connectors**
- **Compact and Lightweight**
- **Internally Conduction-Cooled 3U VPX**
- **Fully Sealed Faraday Cage**
- **EMI/RFI Filtering**
- **Environmentally Sealed (IP65)**
- **Fanless/no moving parts**

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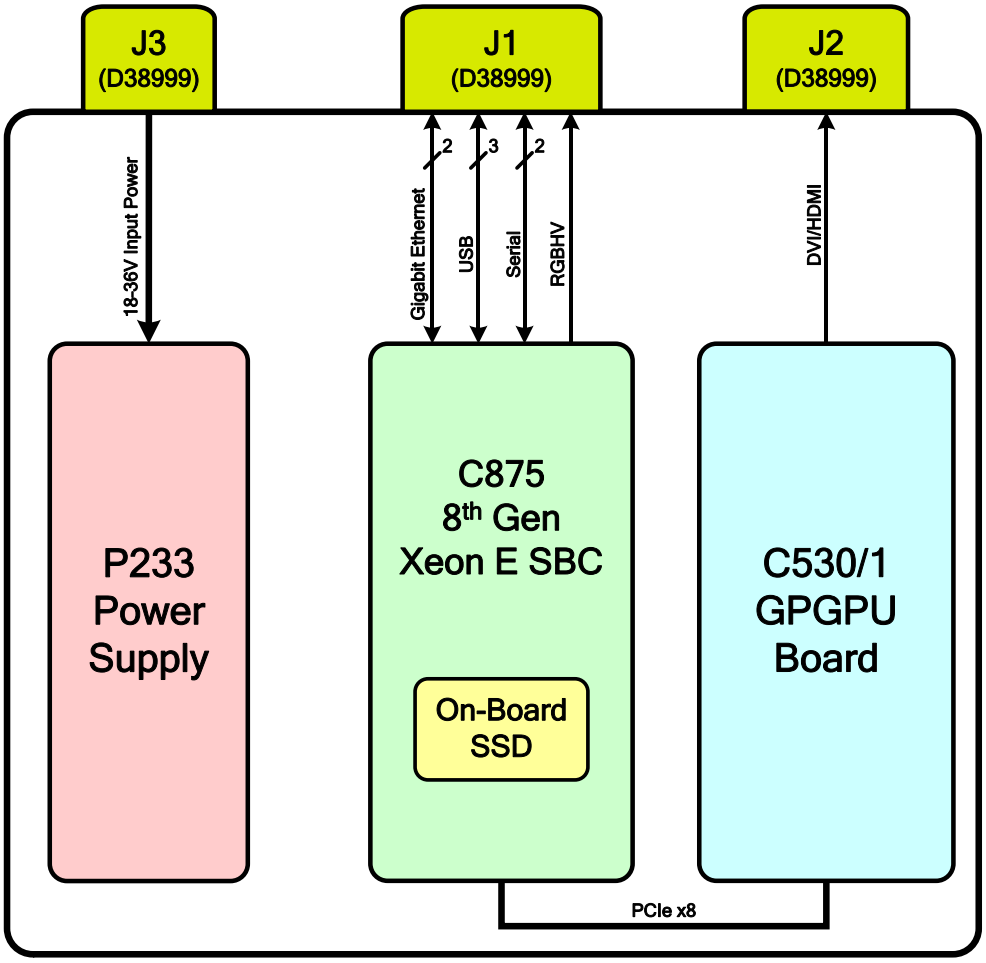
Modern, high-performance GPUs have tremendous processing potential. Utilizing this processing capability for non-graphical applications is known as GPGPU (General Purpose GPU) processing.

Aitech's A193 RediBuilt™ provides GPGPU processing in a fully integrated, ready-to-use system.

The A193 is based on the Aitech's C875 SBC and C530/1 GPGPU Board.

These boards are packaged in an Aitech enclosure along with a high-efficiency power supply, providing a complete High Performance Embedded Computer (HPEC) system in an extremely rugged and compact form factor.



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System Architecture

CPU (C875 SBC)	Xeon E-2176M – 6 core/12 threads (Hyper-Threading) @ 2.7 GHz, 4.4 GHz Turbo Boost, 12 MB Cache
GPU (C530/1 GPGPU)	NVIDIA® GeForce® GTX 1050 • Pascal Architecture • GP107 Graphics Processor • 1.73 TFLOPS • 640 CUDA Cores • 1354 MHz GPU Clock • 4 GB GDDR5 • 128-bit Memory Interface Width • OpenGL 4.5 • OpenCL 1.1 • DirectX 12, Shader 5.0 • CUDA, PhysX • < 5 W Idle, 50 W Max Power • Optimus Technology • Dynamic clock frequency scaling support
System Resources	• Windowed Watchdog Timer • Temperature Sensors • Elapsed Time Recorder • Real Time Clock • Dynamic clock frequency scaling support
VPX Fabric	PCIe x8 backplane link between SBC and GPGPU board

Memory Resources

RAM	16/32 GB of DDR4 SDRAM in dual channels with ECC, operating at 2133 MT/s
Flash Mass Storage	Up to 1 TB Flash SSD on the SBC
BIOS Flash	Dual BIOS Flash devices (Primary device for normal operation, Alternate device for system maintenance)

I/O Interfaces

SBC / CPU		C875 (8th Gen E-2176M Intel® Xeon® CPU)
GPGPU Board / GPU		C530/1 (NVIDIA GeForce GTX 1050)
Video Outputs	**DVI**	1
	RGB	1
Gigabit Ethernet Ports 10/100/1000Base-T		2
UART Serial Ports Software/BIOS configurable as RS-232/422/485		2
USB 2.0 Ports		3

Software

- Supported operating systems
  - Windows 10
  - Linux
- Available with or without supported operating systems pre-installed

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Passive Convection Cooling	Heat passively dissipated to surrounding air via convection & radiation cooling of the sidewall fins.
Cold Plate-Cooling	Sidewalls conduct heat to enclosure base for cooling via the cold plate. Cold plate cooling is supplemented with convective cooling via sidewall fins.
I/O Routing and Connectors	All variants of the A193 are equipped with front panel D38999 I/O and power connectors.

Mechanical

Enclosure Type	**Dimensions (max. including handle)**			**Weight**
	Depth	**Width**	**Height**	
Convection-Cooled	261 mm (10.28")	181 mm (7.13")	140 mm (5.5")	<6.8 kg (15 lbs)
Cold Plate-Cooled	261 mm (10.28")	156 mm (6.15")		

Input Power	• 85% Typical Efficiency Internal Power Supply • 18 – 36 V_{DC} Input Range • EMI/RFI Input Filter	• Input Transient Protection • Input Reverse Polarity Protection • MIL-STD-704D/E Compliance
Power Consumption	110 W Max. Power consumption is dependent on system configuration	

Operating Temp.	**Min**	-40 °C
	Max	Convection-cooled: +55 ºC ambient air Cold plate-cooled: +55 ºC cold plate
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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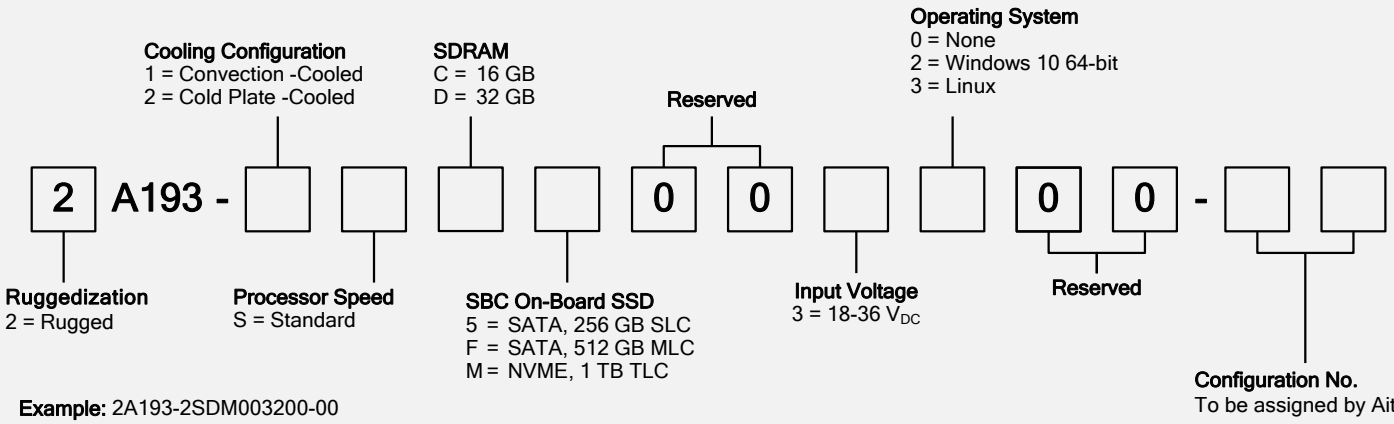
Ordering Information



Example: 2A193-2SDM003200-00

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Optional Accessories

MCS193-1-00	Set of Front Panel Mating Connectors
TC193-J1-00	J1 I/O Breakout Cable
TC193-J2-00	J2 I/O Breakout Cable
TC193-J3-00	J3 Power Cable
PS233-00	28 V_{DC}/150 W External Power Supply (100 - 240 V_{AC} input)

Contact Aitech

Contact your Aitech sales representative for additional product information, and for inquiries regarding customized configurations of the A193 and additional software support.

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