

C876

Intel® Xeon® D – 3U VPX SBC



Embedded Computing
without Compromise



- Rugged 3U VPX Single-slot SBC
- Intel® Xeon® D-1500-series SoC CPU
 - ▶ 4, 8 or 12 SKU cores
- 16 GB DDR4-2133 SDRAM with ECC
- Up to 64 GB On-board SATA III Flash Disk
- On-board Graphics – VGA via SMI750 on PCIe
- Dual 10GBase-KR & Dual 1000BaseT Ethernet
- Versatile Board I/O
 - ▶ 10Gb-KR & GbE
 - ▶ Serial Ports
 - ▶ VGA Graphics
 - ▶ SATA III 6Gb/s
 - ▶ GPIO Lines
 - ▶ PCIe (x8, x16)
 - ▶ USB 3.0 & 2.0
 - ▶ IPM Controller
 - ▶ XMC site
- Trusted Security Platform
 - ▶ Intel Trusted Execution Technology
 - ▶ TPM - Atmel TPM, V1.2
 - ▶ IPMC (in SmartFusion A2F200 FPGA)
 - ▶ Dual Redundant BIOS with auto-failover
- 8 Lane PCIe Gen 3 XMC Slot
- WWDT, RTC, Temp. Sensors
- Linux®, Windows®, VxWorks® Support
- Conduction and Air-Cooled Versions
- Vibration and Shock Resistant



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The C876 is the latest in the series of Aitech's high-performance 3U VPX SBCs for embedded and harsh environment systems applications, featuring an Intel Xeon D 1500 family multicore processor. The heart of the C876 is Intel's Xeon D (formerly Broadwell DE) Silicon on Chip (SoC) platform with up to 12 cores. Along with the latest generation of Intel Xeon D processor, the C876 features a wide variety of on-board I/O, including 10Gb Ethernet, graphics, RS 232/422 serial and USB 3.0 and 2.0 ports and other on-board feature enhancements to round off this leading-edge SBC and Xeon-powered, integrated subsystems.

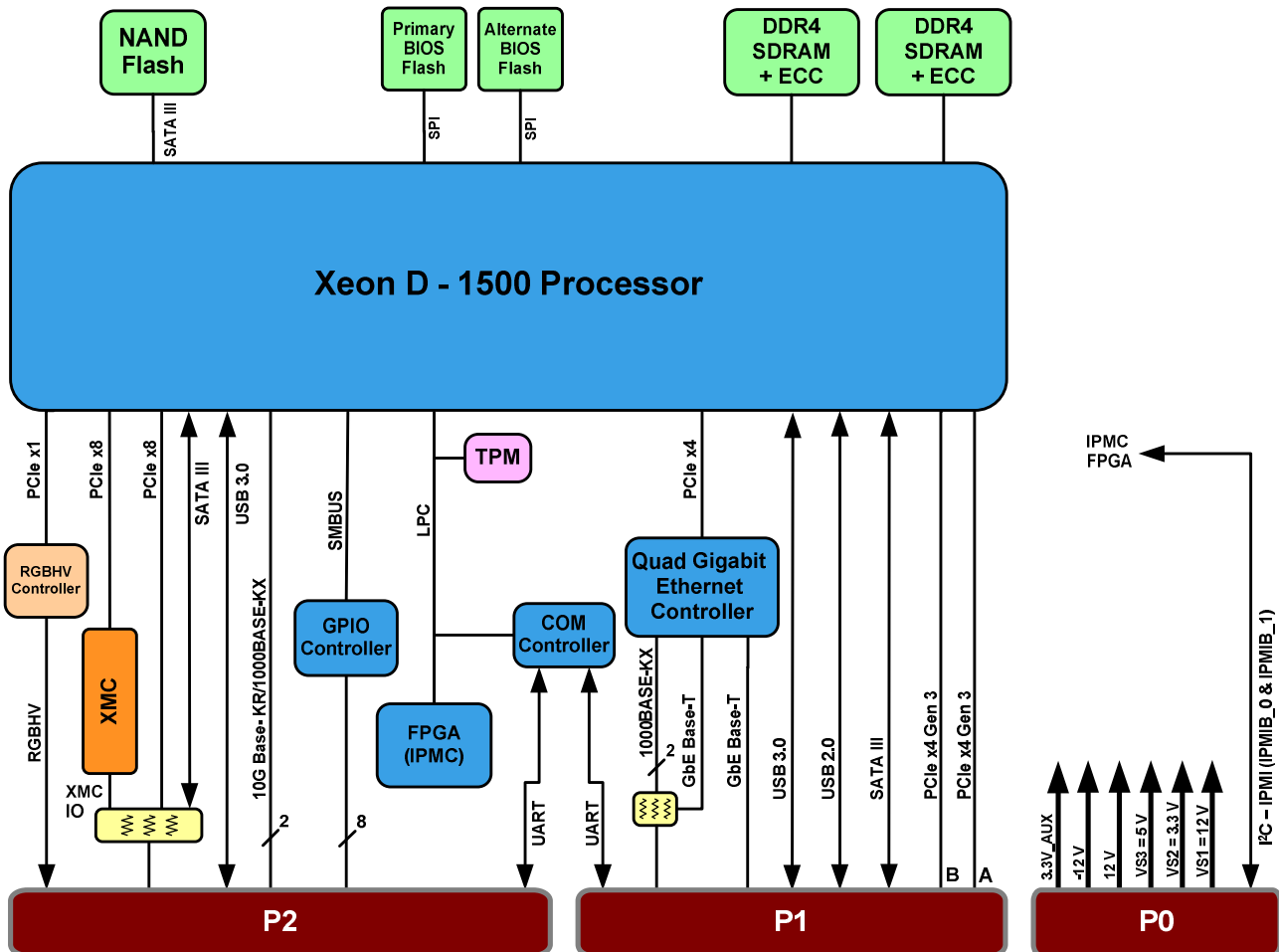
The on-board SMI750 graphics controller supports VGA graphics and general console video processing. Coupled with other Aitech VPX or XMC-based Video Capture and Graphics products, NVIDIA® Jetson™ TX1/TX2 3U VPX GPGPU boards, NVIDIA® Maxwell and Pascal architecture GPUs and powered systems enclosures, incredibly powerful, leading-edge, enhanced video image processing and graphics subsystems can be created.

The C876 integrates the fastest, large on-board SDRAM (DDR4-2133) and mass storage (SATA III Flash disk) resources, and provides a variety of popular I/O interfaces to meet a wide range of system requirements. Expandability and further flexibility are provided by an industry standard XMC slot.

The C876 mechanical and electrical designs guarantee operation over the full range of rugged application environments and is available in industry standard conduction-cooled (with conformal coating) and air-cooled 3U VPX form factors.

The air-cooled, Series 100 version is 100% software compatible with the conduction-cooled versions making it ideal for lower cost lab use software development assembly. A Rear I/O Transition Module (RTM) is also available for Series 100 cards along with air-cooled lab chassis with popular RTOS BSPs and drivers to speed your application software development tasks.

C876 Block Diagram



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Board Architecture

Processor	Intel® Xeon D-1500 series – 4, 8, and 12 Core with Integrated Graphics, 18 MB Cache, 1.5 GHz		
Chipset	Intel Xeon D-1559, -1539 or -1519		
VPX bus	ANSI/VITA 46.x, VITA 65, VITA 47, VITA 48		
Board Resources	<ul style="list-style-type: none">• Watchdog Timers• Trusted Platform Module (TPM)	<ul style="list-style-type: none">• Temperature Sensors• Real Time Clock	<ul style="list-style-type: none">• Dual redundant BIOS
OpenVPX Slot Profiles	Module Profile: MOD3-PAY-2F2T-16.2.5-3 Slot Profile: SLT3-PAY-2F2T-14.2.5		

Memory Resources

RAM	16 GB of DDR4-2133 SDRAM in dual banks with ECC operating at 2133 MT/s
Flash Disk	Up to 64 GB SATA III Flash Disk, using SLC (Single Level Cell) Flash memory
Boot Flash	Dual BIOS Flash devices (Primary device for normal board operation, Alternate device for back-up and maintenance)

I/O

	I/O Variant ⁽¹⁾	
	Variant #1 On-board I/O	Variant #2 XMC I/O
Gigabit Ethernet – 10GBase-KR	2	2
Gigabit Ethernet – 1000Base-BX	2	-
Gigabit Ethernet – 1000Base-T	1	2
PCIe (x8) (For Variant #1 two x8 links can be combined into x16 PCIe Gen 3)	2	1
USB 3.0	2	2
USB 2.0	1	1
SATA 3.0 (6Gb/s)	2	1
Serial Port (RS-232)	-	1
Serial Port (Configurable as RS-232 or RS-422)	1	1
Discrete I/O Lines (via GPIO Exp. Module, 5V tolerant)	8	-
VGA Graphics Output (PCIe x1)	1	1
XMC I/O: Diff Pairs + SE (routed per VITA 46.9)	N/A	X8d+X12d

Note: (1) C876 I/O variants offer different combinations/quantities of on-board and PMC/XMC I/O via factory configuration; additional I/O routing options may be available per customer request, contact an Aitech representative for more information

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XMC Slot

XMC	PCIe x8 port supporting Gen3, 2 and Gen1 speeds and port widths of x8/x4/x2/x1
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Software

Operating Systems	Windows®, VxWorks® and RedHat Linux® are supported
Drivers	Operating system specific device drivers for board resources are available
BIT	POST / Built-In Test

Mechanical

	Form Factor & Dimensions	Weight
Air-Cooled ⁽¹⁾	3U VPX REDI per ANSI/VITA 48.1, 1" pitch	<400 g (0.88 lbs)
Conduction-Cooled	3U VPX REDI per ANSI/VITA 48.2, 0.8" or 1.0" pitch	<860 g (1.90 lbs)
Conduction-Cooled 2LM	3U VPX REDI 2LM per ANSI/VITA 48.2, 0.85" pitch	<930 g (2.05 lbs)

Notes: (1) For Series 100, air-cooled, all board-level I/O is available from the VPX backplane with an I/O Rear Transition Module.

Power

D-1559	+3.3V	+5.0V	+12V	±12V_AUX ⁽³⁾	Total
Typical ^(1,4)	1.1 A	0.81 A	1 A		19.68 W
Maximum ^(2,4)	1.3 A	0.83 A	3.7 A		52.84 W

- Notes:
- (1) Typical power measured during Windows 7 idle condition
 - (2) Maximum power measured during PassMark® BurnInTest (CPU, memory, graphics)
 - (3) ±12V_AUX required for PMC/XMC only
 - (4) Actual power consumption depends on configuration and assembly options
D-1539 power consumption is ~10W less than D-1559; D-1519 power consumption is ~20W less than D-1559

Environmental

Specs per VITA 47	Air-Cooled			Conduction-Cooled	
	Commercial	Rugged	Military	Rugged	Military
Operating Temp.	AC1 (0 to +55 °C) ⁽²⁾	AC3 (-40 to +70 °C) ⁽²⁾	AC4 (-40 to +75 °C) ^(1,2)	CC3 (-40 to +70 °C) ⁽³⁾	CC4 (-40 to +85 °C) ^(1,3)
Non-Operating Temp.	C1 (-40 to +85 °C)	C3 (-50 to +100 °C)	C4 (-55 to +125 °C)	C3 (-50 to +100 °C)	C4 (-55 to +125 °C)
Vibration	V1	V2	V2	V3	V3
Operating Shock	OS1	OS1	OS1	OS2	OS2
Altitude	15,000 ft.	35,000 ft.	70,000 ft.	35,000 ft.	70,000 ft.
Relative Humidity ⁽⁴⁾	0 - 90%			0 - 100%	
Conformal Coating	N/A			Acrylic (Silicone or Urethane are Optional)	

- Notes:
- (1) Contact an Aitech representative for more information
 - (2) Operating ambient air temperature (with sufficient airflow)
 - (3) Operating card edge temperature
 - (4) Non-condensing

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Ordering Information

Ruggedization

1 = Commercial
2 = Rugged
4 = Military

Processor – Xeon-D

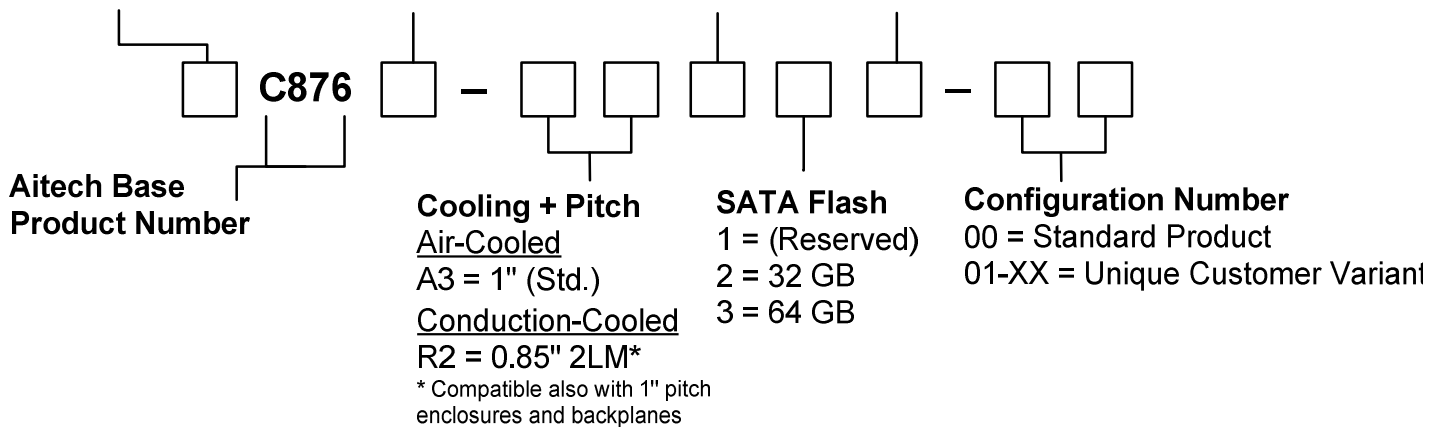
U = 4 core D-1519
V = 8 core D-1539
S = 12 core D-1559

SDRAM Size

A = 16 GB

I/O Variant

1 = Variant #1 (No XMC)
2 = Variant #2



Accessories

TM876 Rear Transition Modules (RTMs) providing convenient access to C876 I/O interfaces via standard connectors. Supports both air and conduction-cooled C876 mounted in commercial air-cooled chassis.

Contact Aitech

Contact your Aitech sales representative for additional product information, and for inquiries regarding customized configurations of the C876 and additional software support.

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