CoolShell CS-5U System

5U 17.75 Inch Blade Server

OVERVIEW

Themis CoolShell™ servers are a compact, lightweight computing solution designed for applications that require availablity in the most demanding environments. The CS-5U combines commercial components with superior thermal and kinetic management in a standards-based, purpose-built enclosure to achieve blade server efficiency and bring total cost of ownership to environmentally challenging applications.

The CoolShell CS-5RU provides the industry's highest compute density in A 5RU high, 17.75 inch deep rackmountable CoolShell Subrack can support up to four CoolShell blades with eight Intel Xeon 5000 Series processor sockets for applications that require enterprise compute power in constrained spaces. System modules are front chassis replaceable to increase uptime, significantly reduce maintenance costs, and support constrained mounting environments. The CoolShell CS-5RU fits in a standard 19 inch rack. Cable connections are also front accessible. Each subrack includes a backplane, N+1 redundant power supplies (PSUs), and redundant 10Gbit Ethernet switches, within the Chassis Management and Communications (CMAC).

Themis CoolShell blade servers provide thermal footprint headroom to accommodate aggressive scaling of commercial microprocessor core density, speed, and power. The CS-5U accommodates shock and events up to 30G at 20 ms without external isolation.

PRODUCT FAMILY FEATURES

All the Benefits of Blade Servers

- High compute density
- Rapid migration to new technologies
- 10 GigE Switch Fabrics
- Built-in system management
- Lower total cost of ownership

I/O and Storage Flexibility of Rack Mounted Servers

- Supports PCI-Express
- Up to 30 Terabytes in a single system
- Accepts high performance graphics and signal processing cards
- Built-in cable management and simple front access cable connectivity
- Reduced system depth – fits in standard 19 inch rack

Ruggedness of Board Level Computers

- Withstands 30G @ 20 ms Shock events (MIL-901D)
- 50°C Operation
- Corrosion Proof Aluminum Construction
- Airflow direction: Front to Rear
- Three hot-swap 850 W Power Supplies 90, 264 VAC or 48 VDC; optional 1050 W AC Power Supplies
- MIL-STD-901d, MIL-STD-810, MIL-STD 167

CS-5U Processor Blade

CS-5U I/O Module

CS-5U SSD/Harddisk Carrier

Figure 1: CoolShell CS-5U System Components

MODULAR MAINTAINABILITY

The CS-5U has an open, modular design with removable, hot swappable components that enable spiral technology refresh and preserve computing infrastructure investments for complete lifecycle management.

COOLSHELL PROCESSOR MODULES

Themis CoolShell Blade Servers are based on industry standard motherboards. The first generation CoolShell CS-5U Processor Module blades are 1RU and are based on motherboards that include two, 4 or 6 core Intel Xeon processors, in a symmetric multiprocessing configuration.

CoolShell CS-5U Processor Module motherboards are enclosed in a light alloy clamshell, isolating the electronics from the environment. Integrated blowers provide a scalable cooling system with low acoustic emissions.

The light alloy clamshell provides the following benefits:

• Mechanical support to mitigate shock and vibration
• Forms a Faraday cage around the electronics to control emissions
• Protects the electronics from dust and dirt contamination
• Conduction cooling for the electronics

Themis CoolShell CS-5U servers are easily upgraded to the latest technology by replacing older processor blades with blades based on the latest technology.

COOLSHELL I/O BLADE MODULE

The CoolShell CS-5U IO Blade provides extreme flexibility to optimally meet customer requirements. It can be configured to be all IO, all storage, or a combination of the two. The whole IO Blade can be associated with a single Processor Blade or the bays can be allocated to support up to two Processor Blades.

A CoolShell CS-5U IO Blade provides three PCI bays. Each bay is configurable to support one of the following options:

• PCI Express 2.0 x16 slot
• Dual PCI Express 2.0 x8 slots
• Storage
• PCI Express 2.0 x16 slot and storage

PCI Express slots are connected to a Processor Blade through the subrack backplane. Each bay can accommodate a double wide high performance graphics card or up to two standard PCI Express cards. Access to the IO cards is from the front of the subrack. Support for standard PCI Express form factors provide for customer choice and rapid updates to the newest technology.

COOLSHELL CS-5U STORAGE CANISTERS

Each CoolShell CS-5U IO Blade bay supports up to two CoolShell CS-5U pluggable storage canisters with a maximum of five per IO Blade. This yields up to 15 TB of capacity using current technology. Each pluggable storage canister houses up to three 2.5-in solid state or rotating spindle drives. The storage canisters can be individually quiesced and are hot pluggable for replacement, upgrade, or general servicing.

A high performance, 24 port SAS/SATA RAID controller provides access to all 15 storage drives within an IO Blade. The RAID controller supports RAID levels 0, 1, 5, 6, 10, 50, 60, and includes built-in management of the arrays.

This includes both in-band and out of band. Arrays are partitioned into several LUNS or can be arranged as a single large disk. Other storage configurations are also possible. Contact Themis for more information.

COOLSHELL 10 GIGABIT ETHERNET FABRICS

CoolShell CS-5U processor Blades are interconnected by two physical 10Gb Ethernet fabrics. Each Processor Blade attaches to the fabrics via four 10Gb Ethernet ports, two to each fabric. Switching for a physical fabric is provided by a 10Gb Ethernet switch on the Chassis Management and Communication Module associated with that fabric.

The switches support managed operation or unmanaged operation, up to layer three. Two switch modules provide complete redundancy for common circuitry of each physical fabric or can be used to provide 40 Gigabit trunk virtualization.

Each Chassis Management and Communication Module provides four ports, 2 copper and 2 optical, each running at 100Mb to 10Gb for external access to it's 10Gb fabric.

COOLSHELL CS-5U POWER SUPPLY MODULES

The CoolShell CS-5U comes standard with three hot-swappable 850-Watt power supply modules, in an N+1 configuration. The power input can be either 90 – 264 VAC or 48VDC. Optionally, 1050-watt AC input power modules are available to support higher power blade configurations.

TECHNICAL SPECIFICATIONS

Environmentals

PARAMETER	BLADE ENVIRONMENTALS	SYSTEM SUBRACK ENVIRONMENTALS
Airflow Direction	Front to rear	Front to rear
Operating Shock	Up to 30G @ 20 ms (MIL-901D)	Up to 30G @ 25 ms (MIL-901D)
Operating Vibration	0.9G (rms) from 10 – 2000Hz	1G (rms) from 10 – 2000Hz
Operating Temperature	0° - 50°C sea level	0° - 50°C sea level
Humidity	Up to 90% non-condensing	Up to 90% non-condensing
Dimensions (H x W x D)	1RU: 1.625″ (41.275 mm) x 16.50″ (419.1 mm) x 17.00″	5RU: 8.75″ (222.25 mm) x 17.5″ (444.5 mm) x 17.75″ (450.85 mm)

THEMIS VALUE

Themis provides systems manufacturers and end-users with the most modern, best-of-breed computing resources available. Package and performance scale from small form factor embedded servers to bladed servers.

Themis listens, understands, and works closely with our customers to optimize computing solutions that are easy to integrate, yet inexpensive to own and operate. Our solutions achieve the right balance between standard commercial technology and requirements for rugged environments, optimizing space, weight, and performance. For more information on Themis products, visit www.themis.com

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