

Themis CoolShell CS-5U System



New 5RU Blade Server System

CoolShell System Features and Benefits

Provides all of the benefits of Blade Servers	I/O and Storage Flexibility of Rackmount Servers	Ruggedness of Board Level Computers
- High Compute Density	- Supports PCI-Express	- 30G Shock, 1G Vibration
- Rapid Migration to new technologies	- Up to 30 Terabytes in a single system	- Meets MIL 901d, 810 and 167
- 10 GigE Switch Fabrics	- Accepts High Performance Graphics and Signal Processing Cards	- 50° C Operation
- Built-in System Management	- Built-in Cable Management and Simple Front Access Cable Connectivity	- Corrosion Proof Aluminum Construction
- Lower total Cost of Ownership	- Reduced System Depth - Fits in Standard 19" Rack	

Themis' new CoolShell™ servers are designed for applications that need a compact, lightweight computing solution that must operate in demanding environments. CoolShell systems use COTS components to bring blade server efficiency and total cost of ownership to environmentally challenging applications. To help the CoolShell CS-5U keep its "cool", every module has its own integrated cooling fans. There are no fans or active components other than those within the field replaceable modules.

CoolShell CS-5RU System

The CoolShell CS-5RU is a completely modular system that provides the industry's highest compute density. A 5RU high, 17.75" deep rackmountable CoolShell Subrack can support up to four CoolShell blades with either eight Nehalem or sixteen Nehalem-EX sockets for applications that need enterprise compute power in a very constrained space. All modules are replaceable from the front increasing uptime, significantly reducing maintenance costs, and supporting constrained mounting environments. Cable connections are on the front, no rear access is required. Each subrack includes a backplane, N+1 redundant power supplies (PSUs), and redundant 10Gbit Ethernet switches, within the Chassis Management and Communications (CMAC). The CoolShell CS-5RU fits in a standard 19" rack.

Innovative CoolShell Processor Modules

Themis' CoolShell is based on industry standard motherboards. The first generation CoolShell CS-5U Processor Module blades are 1RU and are based on motherboards that include two quad core Intel Xeon processors, in a symmetric multiprocessing configuration. CoolShell CS-5U systems can be quickly updated to the latest processor technology, since they are based on commercially available components. Consult factory for quad socket processor availability.

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 these 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 mix 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 can be configured to support one of the following options:

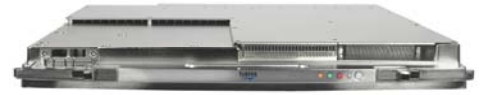
- PCI Express 2.0 x16 slot
- Dual PCI Express 2.0 x8 slots
- Storage
- PCI Express 2.0 x16 slot and storage

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 System

- CS-5U I/O Blade
- CS-5U Processor Blade
- CS-5U I/O Blade (Storage)
- CS-5U Processor Blade



CoolShell CS-5U Processor Blade



CoolShell CS-5U I/O Blade



CoolShell CS-5U I/O Drive Canister

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 15TB 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 can provide access to up 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 of the arrays, both in-band and out of band. Arrays can be partitioned into several LUNS or can be arranged as a single large disk. Other storage configurations are possible. Contact the factory 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, up to layer 3, or unmanaged operation. Two switch modules provide for 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.

Blade Environmentals

- Airflow direction: Front to Rear
- Operating Shock: up to 30G @ 20 ms (MIL-901D)
- Operating Vibration: 0.9G (rms) from 10 – 2000Hz
- Operating Temperature: 0° - 50°C sea level
- Humidity: up to 90% non-condensing
- Dimensions (HWD) - 1RU:
1.625" (41.275 mm) x 16.50" (419.1 mm) x 17.00" (431.8 mm)

Subrack Environmentals

- Airflow direction: Front to Rear
- Operating Shock: up to 30G @ 25 ms (MIL-901D)
- Operating Vibration: 1G (rms) from 10 – 2000Hz
- Operating Temperature: 0° - 50°C sea level
- Humidity: up to 90% non-condensing
- Dimensions (HWD) - 5RU:
8.75" (222.25 mm) x 17.5" (444.5 mm) x 17.75" (450.85 mm)

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