

# A + Server Solutions

World's Most Versatile Portfolio of AMD-Based Systems



### **SUPERMICRO<sup>®</sup> H12 GENERATION A+ SERVERS**

The Most Comprehensive Portfolio of AMD-Based Systems, including Servers, Storage, GPU-Optimized, SuperBlade, and Multi-Node Twin, Solutions to Exactly Match System Requirements to Your Workload

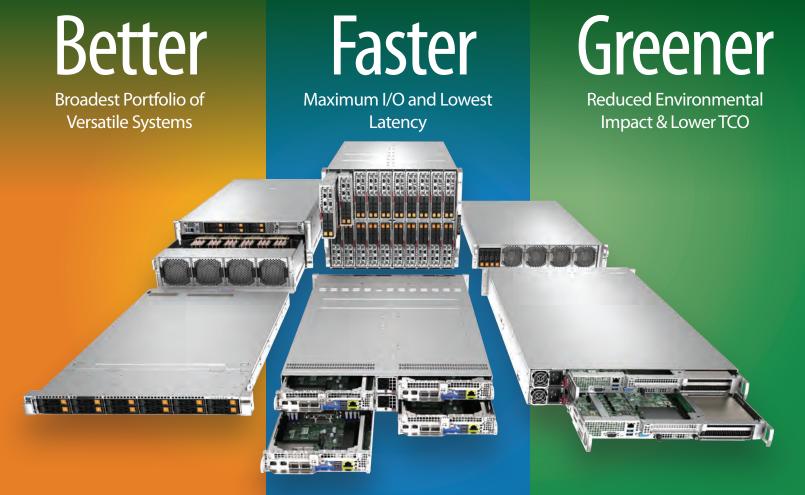


March 2021



# INTRODUCING H12 GENERATION A+ SERVERS





### OPTIMIZED SYSTEMS FOR YOUR WORKLOAD

• Max Performance, High Volume Cloud, High Efficiency Multi-Node, Mainstream

#### **OPEN ARCHITECTURES**

- OpenBMC, OCP v3.0 SFF Cards
- New Supermicro<sup>®</sup> AIOM Cards Provide I/O Flexibility with OCP Superset

#### SECURE

Root of Trust

#### **MANAGEABLE & SERVICEABLE**

- New Web IPMI Experience
- Tool-less Designs
- Global Service & Support

#### FIRST-TO-MARKET WITH MAXIMUM PERFORMANCE

- Thermal Capacity Supports Highest Clock
   Speeds
- Support for Full memory Configuration and Bandwidth

#### **CPU & MEMORY**

- Supports the latest AMD EPYC Processors with up to 64 Cores Per Socket
- Up to 8TB of DDR4-3200Mhz Memory

#### I/O

• PCI-E 4.0

#### SUPERBLADE:

 Advanced Networking with 200G InfiniBand Switch, and up to 4x 25GbE Switches

#### **BEST-IN-CLASS WORKLOAD PERFORMANCE**

 Market-Leading GPU Servers for AI/ML and HPC

#### MAXIMUM POWER EFFICIENCY

- Both Free Air and Water Cooled
- Titanium-Level (96%) Power Supplies

#### **MULTI-NODE SYSTEMS**

 Optimized Shared Resources for Reduction in Power and Cooling TCO

#### LEADING SYSTEM THERMAL DESIGNS

- Max Performance per Watt and per Dollar
- Highest Availability
- Reduced TCO and TCE (total cost to the environment)

# **SUPERMICRO<sup>®</sup> H12 GENERATION A+ SERVERS**

Choose from the most comprehensive line of servers, GPU and blade systems in the industry Up to 64 cores/128 threads per socket with AMD EPYC<sup>™</sup> 7003 or 7002 Series Processors\* Up to 32 DIMMs of DDR4-3200MHz memory for up to 8TB per system Increased I/O throughput with PCI-E 4.0 and up to 128 lanes per socket Hot-pluggable U.2 NVMe storage for better application responsiveness 3-Year Limited Warranty and 24-Hour Technical Support



#### H12 Twin Systems

#### Industry Leading Multi-Node Architectures

- Single/Dual Socket, up to 240W TDP
- 16 DIMMs DDR4-3200MHz, up to 4TB
- Flexible onboard SIOM networking up to 100G Ethernet
- Up to 4x 2.5" NVMe/SATA + 2x 2.5" SATA or 3x 3.5" SATA
- Redundant 2200W Titanium Level power supplies



#### H12 Ultra

#### Industry Leading IOPS, Energy Efficiency, and Flexibility

- Dual Socket, up to 280W TDP
- 32 DIMMs DDR4-3200MHz, up to 8TB
- Flexible onboard networking up to 4x 10G Ethernet
- 24/12x U.2 NVMe in 2U/1U or 12/4x
   3.5" SATA in 2U/1U
- Redundant 1200W/1600W Titanium Level power supplies



Cost and Energy Efficiency for Data Center Environments

- Single Socket, up to 280W TDP
- 16 DIMMs DDR4-3200MHz, up to 4TB
- Onboard 2x 10G Ethernet
- 2.5" or 3.5" NVMe/SATA drives
  Redundant 750W Platinum Level power supplies



#### H12 SuperBlade®

#### High Density, Performance, and Efficient Resource-Saving Architecture

- Up to 20x 1-socket SuperBlade servers in 8U
- Single Socket with 8 DIMMs, up to 2TB
- Onboard 2x 25G Ethernet and optional
   200G HDR
- Up to 2 hot-pluggable NVMe/SAS/SATA and 2 M.2 per node
- Up to 1 double-wide or 2 single-wide GPUs per node



#### H12 GPU System

#### The Broadest Portfolio for AI, Deep Learning, and HPC acceleration

- Dual Socket, up to 280W TDP
- 32 DIMMs DDR4-3200MHz, up to 8TB
- Supports the latest GPUs including NVIDIA A100 and AMD Instinct MI100
- Onboard GbE or flexible AIOM networking (Redstone no AIOM, Delta not default with onboard LAN)
- Redundant 3000W Titanium Level
   power supplies

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#### H12 Mainstream

Efficient and Cost-Effective Designs for Mainstream Applications

- H12 mainstream support up to 280W
   TDP
- 16 DIMMs DDR4-3200MHz, up to 4TB
- Up to onboard 2x 10G Ethernet
  Up to 8x 3.5" SATA drives in 2U with SAS option
- 1U, 2U, 4U rackmount/tower

## H12 GPU SYSTEMS Maximum Acceleration for AI / Deep Learning and HPC

Dense and scalable multi-GPU powerhouse supporting latest GPUs

Directly attached PCI-E 4.0 x16 CPU to GPU lanes with low latency, NVIDIA NVLink and NVSwitch

Flexible AIOM/OCP 3.0 networking for up to 200G, GPUDirect RDMA and Storage



AS-2114GT-DNR



AS -2114GT-DNR 2U 2 Node Single-Processor System with 3 GPUs per Node



AS -2124GQ-NART 2U Dual Processor GPU System with NVIDIA HGX A100 4-GPU, NVLink.



AS -4124GO-NART 4U Dual-Processor GPU System with NVIDIA HGX A100 8-GPU, NVLink, and NVSwitch



AS -4124GS-TNR 4U Dual-Processor, Dual-Root GPU System with 8 PCI-E GPUs

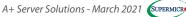
#### **MAXIMUM ACCELERATION A+ GPU SYSTEM**

With Supermicro's advanced architecture and thermal design, including liquid cooling and custom heatsinks, our 2U, 4U GPU systems drive NVIDIA's latest HGX A100 4-GPU or 8-GPU baseboards, as well as supporting up to 8 directly attached double-width or single-width PCI-E GPU cards, including the latest NVIDIA A100 or AMD Instinct MI100 GPUs in a hyper-dense system.

Supermicro's unique AIOM and a slew of PCI-E 4.0 slots of these systems enhance the multi-GPU communication and high-speed data flow between systems at a large scale.

The H12 GPU systems feature the latest technology stacks such as 200G networking, NVIDIA NVLink and NVSwitch, 1:1 GPUDirect RDMA, GPUDirect Storage, and NVMe-oF on InfiniBand.

- AI/ML
- Deep Learning Training and Inference
- High Performance Computing (HPC)
- Research Laboratory/National Laboratory
- Molecular Dynamics Simulation
- Astrophysics Simulation
- Chemistry Simulation



# H12 TWIN SYSTEMS Leading Multi-node Architectures

Highly configurable 2U 4-node systems

2-socket with 16 DIMMs or 1-socket with 8 DIMMs per node

Flexible storage and I/O options including NVMe/SATA3 and SIOM networking



A+ BigTwin® (2U4N)



AS -2124BT-HNTR 2U System with 4 hot-pluggable Dual-Processor Server Nodes with U.2 NVMe



AS -2124BT-HTR 2U System with 4 hot-pluggable Dual-Processor Server Nodes with U.2 SATA

TwinPro<sup>®</sup> - 2U 4 UP Nodes



AS -2014TP-HTR 2U System with 4 hot-pluggable Single-Processor Server Nodes

#### **NO-COMPROMISE 2U 4-NODE ARCHITECTURE**

BigTwin is the 5th generation in the Supermicro<sup>®</sup> Twin Family with a multitude of innovations and engineering breakthroughs.

TwinPro systems are designed for simplified deployment and maintenance, and assembled with the highest quality to ensure continuous operation even at maximum capacity.

Customers in high-end enterprise, data center, HPC and Cloud Computing environments receive the greatest competitive advantage from data center resources with the Supermicro<sup>®</sup> TwinPro.

- HCI
- HPC
- CDN
- 5G UPF
- Cloud Computing
- Big Data Analytics
- Back-up and Recovery
- Scale-Out Storage

# H12 ULTRA SYSTEMS Industry Leading IOPS, Energy Efficiency, and Flexibility

Optimized for highest processor TDPs

Up to 24x Hybrid NVMe/SAS/SATA drive bays

Up to 3 double width GPUs



AS-1124US-TNRP

1U Ultra, 12 NVMe



AS-1124US-TNRP 1U Dual-Processor Server with 32 DIMMs and 12x hot-swap 2.5" U.2 NVMe drives

1U Ultra, 8TB DDR4



AS-1024US-TRT 1U Dual-Processor Server with 32 DIMMs and 4x hot-swap 3.5" SATA/NVMe drives

#### 2U Ultra, 8TB DDR4



AS-2124US-TNRP 2U Dual-Processor Server with 32 DIMMs and 24x hot-swap 2.5" U.2 NVMe drives

#### 2U Ultra, 8TB DDR4



AS -2024US-TRT 2U Dual-Processor Server with 32 DIMMs and 12x hot-swap 3.5" SATA/NVMe drives

#### **HIGHEST PERFORMANCE A+ ULTRA SERVERS**

Supermicro® A+ Ultra system are designed to deliver the highest performance, flexibility, scalability and serviceability to demanding IT environments, and to power mission-critical Enterprise workloads, including support for dual AMD EPYC<sup>™</sup> 7003 or 7002 Series Processors\* and 32 DIMMs of DDR4-3200MHz memory for up to 8TB of capacity.

- Uncompromised performance design with 2 CPU sockets and 32 DIMMs optimized for supporting the highest processor TDPs
- Best-in-class server features including all NVMe, hybrid storage and low latency • optimizations
- Vast networking and expansion possibilities with Ultra Riser cards

\* AMD EPYC<sup>™</sup> 7003 series processor support requires BIOS version 2.0 or newer

- Enterprise Server
- Hyperconverged Storage
- Virtualization
- AI Training/Inferencing
- Big Data Analytics
- Cloud Computing
- CDN
- In-Memory Database

## H12 CLOUDDC Ultimate Scalability and Flexibility on I/O and Storage for Cloud Data Centers

Tool-less design with single-socket I/O configurability, and 16 DIMMs, DDR4-3200MHz up to 4TB of memory

Dual AIOM slots for flexible (OCP 3.0 compliant) networking plus 10 SATA drive bays with optional support of up to 10 NVMe/SAS in 1U

Go beyond the limit with 4 PCI-E 4.0 x16 slots (in 2U), or 2 PCI-E 4.0 x16 slots in 1U for add on features like NIC, storage controller and optional PCI-E 4.0 x16 FHFL GPU support





# Tool-less Mechanical Design for Rapid Cloud Deployment and Easy Maintenance

Ultimate flexibility on I/O and storage with 2 or 4 PCI-E 4.0 x16 slots and dual AIOM slots for maximum data throuput, A+ Cloud DC is designed to have great serviceability with tool-less brackets and trays, redundant power supplies and hot-swappable drives that help make maintenance of today's demanding data center easier and quicker.

Redundant high-efficiency Platinum Level power supplies for resiliency and serviceability.

Rich Security Features: TPM 1.2/2.0, signed firmware, Silicon Root of Trust, Secure Boot, System Erase, Runtime FW protection, FIPS Compliance, Trusted Execution Environment.

- Cloud Computing
- Web Server
- Hyper-converged Storage
- Virtualization, File Servers
- Head-node Computing
- Telcom Security Server

# H12 SUPERBLADE<sup>®</sup> Performance and Density Optimized Resource Saving Architecture

Up to 20 hot-pluggable nodes in 8U

Highest density GPU platform for AI and Deep Learning

Integrated HPC network fabrics for up to 200G HDR InfiniBand with 100% non-blocking switch



SBE-820C/H/L/J (Front View)

Up to 20 Single Processor Nodes in 8U with 8 DIMMs and mezzanine card for advanced networking



SATA/NVMe Model (AIOM module)



SBA-4114S-C2N SAS/SATA/NVMe Model (AIOM module)



SBA-4119SG GPU Model with 2 GPUs, M.2 NVMe

#### **RESOURCE SAVING ARCHITECTURE**

A shared cooling, power and networking infrastructure is key to the high density and server efficiency offered by blade solutions. Supermicro's high performance, density optimized, and energy-efficient SuperBlade<sup>®</sup> can significantly reduce initial capital and operational expenses for many organizations.

In particular, Supermicro's new generation blade product portfolio has been designed to optimize the TCO of key components for today's datacenters, such as free-air cooling, power efficiency, node density and networking management.

**Key Applications** 

- HPC
- AI/ML/DL
- Hybrid Cloud
- EDA
- Virtualization
- Health
- Financial Services



# H12 WIO SERVERS Industry's Widest Variety of I/O Optimized Servers

Cost saving single-socket I/O configurability with up to 64 cores, 8 or 16 DIMMs

Up to 10x (1U) or 24x (2U) U.2 NVMe and dual onboard 10G

Redundant high-efficiency 750W Platinum Level or 1200W Titanium power supplies



AS -1114S-WN10RT



AS -1014S-WTRT 1U Single-Processor Server with 8 DIMMs, 4x 3.5" SATA drives, 2x M.2, optional 4x U.2 NVMe and 2x NVIDIA T4 GPUs



AS -1114S-WTRT 1U Single-Processor Server with 8 DIMMs, 10x 2.5" SATA, 2x M.2, optional 2x U.2 NVMe drives and 2 NVIDIA T4 GPUs



AS -1114S-WN10RT 1U Single-Processor Server with 16 DIMMs and 10x 2.5" U.2 NVMe drives

2U WIO



AS -2114S-WN24RT 2U Single-Processor Server with 16 DIMMs and 24x U.2 NVMe drives

#### COST AND ENERGY EFFICIENCY FOR DATA CENTER ENVIRONMENTS

Supermicro<sup>®</sup> A+ WIO systems offer a wide range of I/O options to deliver truly optimized systems for specific requirements. Users can optimize the storage and networking alternatives to accelerate performance, increase efficiency and find the perfect fit for their applications.

In addition to enabling customizable configurations and optimization for multiple application requirements, A+ WIO servers also provide attractive cost advantages and investment protection.

- Enterprise Mission-critical Applications
- Data Center Cloud Computing
- Virtualization
- Big Data
- · Financial Analysis



# H12 FATTWIN<sup>®</sup> Advanced 4U Twin Architecture with 8 and 4 Nodes

Highly modular multi-node (4U 8-Node or 4U 4-Node) systems with tool-less design and independent backplanes built-in per node to eliminate a single point of failure

Front or Rear I/O accessible service design depending on data center environments

All-hybrid drive bays - NVMe, SAS, or SATA



AS -F1114S-FT

FatTwin<sup>®</sup> - Front I/O 8 UP Nodes



AS -F1114S-FT 4U Front I/O System with 8 Hot-pluggable Single-Processor Server Nodes with 2-4x 2.5" SATA3/NVMe drives per node

#### FatTwin<sup>®</sup> - Rear I/O 4 UP Nodes



AS -F2014S-RNTR 4U Rear I/O System with 4 Hot-pluggable Single-Processor Server Nodes with 8x 3.5" drives and 4x M.2 per node

#### FatTwin® - Rear I/O 8 UP Nodes



AS -F1114S-RNTR 4U Rear I/O System with 8 Hot-pluggable Single-Processor Nodes with 6x 2.5" drives and 4x M.2 per node

# FRONT OR REAR I/O TWIN ARCHITECTURE TO MAXIMIZE SERVICEABILITY AND RELIABILITY

The innovative FatTwin architecture provides flexibility and system accessibility for unique datacenter requirements with front or rear I/O, as well as electrically isolated, modularized left/right nodes with redundant power supplies for maximum reliability.

- Single AMD EPYC<sup>™</sup> 7003 or 7002 Series Processor\* (TDP up to 280W) per node
- Flexible AIOM networking
- Electrically isolated Redundant Titanium Level power supplies per side (2 left, 2 right)

- Hyperscale / Hyperconverged
- HPC and Big Data
- Data Center Enterprise Applications
- Scale Out Storage
- Telco Data Center & Virtualization Server



# H12/H11 MAINSTREAM

Versatile Entry Level and Volume Servers for Enterprise Server Applications

Highly versatile servers to enable a wide variety of enterprise server applications

Choices of multiple form factors including rackmount, short-depth rackmount and tower

A rich selection of storage options, AOCs, CPU TDP and memory speed support



**SuperWorkstation** 5U Rackmountable/Tower AS-5014A-TT



AS-1013S-MTR Short-depth 1U Single-Processor Server with 8 DIMMs



AS-2013S-COR 2U Single-Processor Server with 8 DIMMs



AS -3014TS-i Mid-Tower Single-Processor Server with 16 DIMMs, up to 3 GPUs



AS-4023S-TRT 4U Tower Dual-Processor Server with 16 DIMMs and dual 10GbE





AS-5014A-TT AMD Ryzen<sup>™</sup> Threadripper<sup>™</sup> PRO 3000WX Series Processor, with 8 DIMMs, 6 PCI-E x16 and dual 10GbE

#### MAINSTREAM APPLICATION OPTIMIZED

The A+ H12 Mainstream Application Optimized product family from Supermicro® is a series of servers designed for entry level or volume selections. Enterprise IT managers can choose the exact model for their applications, with a precise set of integrated features needed for their applications.

These powerful yet cost-effective systems provide excellent flexibility and value at entry-level price points.

- SMB
- Virtualization
- Web Server
- AI Inferencing
- Cloud Computing
- Head-node Computing



### H12 AIOM/SIOM NETWORKING New Supermicro® Advanced I/O Module (AIOM) Cards Provide I/O flexibility with OCP Superset

#### **AIOM NETWORKING**

Supermicro® Advanced I/O Module (AIOM) extends the OCP 3.0 specification with unique features that tackle some of the biggest challenges such as thermal control, ability to support a wide range of networking options in a small size form factor, remote management, and quick and simple deployment. With AIOM, datacenters may enjoy longer refresh cycles and receive better ROI. For large scale cloud datacenters, AIOM provides improved mechanical and thermal designs (improved airflow) and increased serviceability, allowing the AIOM modules to be serviced and/or replaced without opening the chassis. Many more AIOM options will be available, including 2x 1G RJ45, 4x 1G RJ45, 2x 10G RJ45, 2x 10G SFP+, 4x 10G SFP+, 2x 25G SFP28 & 2x 100G QSFP28 and more.



Model	AOC-A25G-b2SM	AOC-AG-i4SM
Description	2x 25GbE SFP28	4x GbE SFP

#### SIOM NETWORKING

Supermicro<sup>®</sup> Super I/O Module (SIOM) delivers up to 50% of I/O cost savings and freedom to select networking options from 1Gb/s to 100Gb/s through a Supermicro<sup>®</sup> optimized form factor that is easy to scale, service and manage across a broad range of Supermicro<sup>®</sup> server and storage systems. The SIOM also enables a higher degree of system integration and increased capacity by saving PCI-E slots that are traditionally reserved for add on cards.

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Model	AOC-MGP-i2M	AOC-MGP-i4M	AOC-MTGN-i2SM	AOC-MTG-i4SM	AOC-MTG-i2TM	AOC-MTG-i4TM
Description	2x GbE RJ45	4x GbE RJ45	2x 10GbE SFP+	4x 10GbE SFP+	2x 10GbE RJ45	4x 10GbE RJ45





#### H12 GPU (For Complete System Only)

#### 4U 8-GPU with HGX





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MODEL	AS -4124GS-TNR**	AS -2114GT-DNR	AS -4124GO-NART	AS -2124GQ-NART
Processor Support	Dual AMD EPYC™ 7003 or 7002 Series Processors*	Single AMD EPYC™ 7003 or 7002 Series Processor*	Dual AMD EPYC™ 7003 or 7002 Series Processors*	Dual AMD EPYC™ 7003 or 7002 Series Processors*
Key Applications	<ul> <li>HPC</li> <li>AI/ML</li> <li>Cloud Gaming</li> <li>Research &amp; Academia</li> </ul>	<ul> <li>Cloud Gaming</li> <li>Media/Video Streaming Gaming</li> <li>Al Inference and Machine Learning</li> </ul>	<ul> <li>AI Compute / Model Training / Deep Learning</li> <li>HPC</li> <li>System for All AI Workload</li> </ul>	<ul> <li>Al Compute / Model Training / Deep Learning</li> <li>HPC</li> </ul>
Outstanding Features	<ul> <li>160 PCI-E lanes</li> <li>8 direct attached GPUs</li> <li>PCI-E 4.0</li> <li>Flexible architecture</li> <li>AIOM support</li> </ul>	<ul> <li>4 NVMe for GPUDirect Storage</li> <li>Up to 8 DIMMs per node</li> <li>M.2 Support</li> <li>Supports 6 PCI-E and 1 Mezzanine card</li> </ul>	<ul> <li>Highest 8 GPU communication using NVIDIA NVLink and NVSwitch</li> <li>Up to 8 NICS for GPUDirect RDMA (1:1 GPU Ratio)</li> <li>Up to 8 NVMe for GPUDirect Storage with optional backplane</li> </ul>	<ul> <li>High-density 2U with 4 GPU peer- to-peer communication</li> <li>Directly attached GPUs for low latency</li> <li>4 NICs for GPUDirect RDMA (1:1 GPU Ratio)</li> </ul>
Serverboard	SUPER <sup>®</sup> H12DSG-O-CPU	SUPER <sup>®</sup> H12SSG-AN6	SUPER <sup>®</sup> H12DGO-6	SUPER <sup>®</sup> H12DSG-Q-CPU6
System Memory (Max.)	Up to 8TB Registered ECC DDR4- 3200Mhz SDRAM in 32 DIMMs	Up to 2TB DDR4-3200MHz ECC 3DS LRDIMM in 8 DIMMs	Up to 8TB 3DS ECC DDR4-3200MHz SDRAM in 32 DIMMs	Up to 8TB 3DS ECC DDR4-3200MHz SDRAM in 32 DIMMs
Expansion Slots	9 PCI-E 4.0 x16 (Option: 10 PCI-E 4.0 x16 slots without NVMe devices)	6 PCI-E 4.0 x16 (4 Internal and 2 external); 1 AIOM card support; 2 M.2 PCI-E 4.0 x4 slots 2280/2210; M-key	8 PCI-E 4.0 x16 (LP) slots from PCI-E Switch; 1 PCI-E 4.0 x16 (LP) and 1 PCI-E 4.0 x8 slot from CPUs	4 PCI-E 4.0 x16 (LP) slots; 1 PCI-E 4.0 x8 (LP) slot
Onboard Storage Controller	2x 2.5" SATA in RAID 1 via onboard Marvell 9230	AMD SP3	SATA3, PCI-E 4.0 U.2 NVMe and PCI-E 4.0 M.2 NVMe	SATA/NVMe Hybrid or SAS with optional HBA
Connectivity	2 GbE LAN ports (rear)	AIOM Network Card For Flexible Networking Options (not included)	OCP 3.0 / AIOM NIC	Dual RJ45 10GbE-aggregate host LAN, RJ45 1GbE IPMI
VGA/Audio	Aspeed AST2500 BMC	Aspeed AST2600 BMC	Aspeed AST2600 BMC	Aspeed AST2600 BMC
Management	IPMI 2.0 with virtual media over LAN and KVM-over-LAN support	IPMI2.0; KVM with dedicated LAN; SPM; SSM; SUM; SuperDoctor <sup>®</sup> 5; Watchdog	IPMI 2.0 with Virtual Media over LAN and KVM-over-LAN support. Dedicated IPMI LAN port	IPMI 2.0 with Virtual Media over LAN and KVM-over-LAN support. Dedicated IPMI LAN port
Drive Bays	Up to 24x 2.5" SAS/SATA drive bays	2 Front Hot-swap U.2 NVMe Gen4 drive bays per node	6x hot-swap 2.5" drive bays (SATA/ NVMe Hybrid or SAS with optional HBA) Up to 10x hot-swap 2.5" drive bays with optional backplane, 2 NVMe M.2 (Internal)	4x hot-swap 2.5" drive bays (SATA/ NVMe Hybrid or SAS with optional HBA)
Peripheral Bays	N/A	N/A	N/A	N/A
Power Supply	2000W (2+2) Redundant Titanium Level (96%+) power supplies	Redundant 1 + 1 2600W Titanium Level (96%) (Full redundancy based on configuration and application load)	Four 2200W high-efficiency Platinum Level power supplies	Two 2200W high-efficiency Platinum Level power supplies
Cooling System	8x hot-swap 11.5K RPM cooling fans	4x 80mm heavy duty PWM fans	4x hot-swap heavy duty PWM fans	4x hot-swap heavy duty PWM fans
Form Factor	4U Rackmount 178 x 437 x 737mm (7.0" x 17.2" x 29")	2U (2-node) Rackmount 447 x 88 x 760mm (17.6" x 3.47" x 29.9")	4U Rackmount 446 x 174 x 900mm (17.6" x 6.9" x 35.4")	2U Rackmount 437 x 89 x 823mm (17.2" x 3.5" x 32.4")

\* AMD EPYC  $^{\rm m}$  7003 series processor support requires BIOS version 2.0 or newer \*\* Can be sold as barebone system



#### 8 Nodes, Rear IO







4 Nodes, Rear IO



MODEL	AS -F1114S-FT	AS -F1114S-RNTR	AS -F2014S-RNTR
Processor Support	Single AMD EPYC™ 7003 or 7002 Series Processor*	Single AMD EPYC™ 7003 or 7002 Series Processor*	Single AMD EPYC™ 7003 or 7002 Series Processor*
Key Applications	<ul> <li>Hyperscale and Hyperconverged Solutions</li> <li>Cloud Computing</li> <li>Cluster Node</li> <li>Data Center</li> <li>HPC cluster computer nodes</li> </ul>	<ul> <li>Hyperscale / Hyperconverged</li> <li>HPC and Big Data</li> <li>Data Center Enterprise Applications</li> <li>Scale Out Storage</li> <li>Telco Data Center</li> <li>Virtualization Server</li> </ul>	<ul> <li>Hyperscale / Hyperconverged</li> <li>HPC and Big Data</li> <li>Data Center Enterprise Applications</li> <li>Scale Out Storage</li> <li>Telco Data Center</li> <li>Virtualization Server</li> </ul>
Outstanding Features	<ul> <li>8 nodes in a 4U system</li> <li>280W CPU support</li> <li>Supports up to 64 cores</li> <li>2x LP PCI-E x16 slots; 1x AIOM PCI-E x16 slot per node</li> <li>Supports 2-4x 2.5" SATA drives per node</li> <li>Quad 2200W Titanium Level high- efficiency power supplies</li> </ul>	<ul> <li>Up to 6 hot-swap optional SATA/NVMe drives per node</li> <li>4 onboard M.2 SATA/NVMe support per node</li> <li>Flexible AIOM module per node</li> <li>1 PCI-E add-on card per node</li> <li>Up to 8 DIMMs per node</li> </ul>	<ul> <li>Can support up to 8 SATA/NVMe drives per node</li> <li>Can support up to 10 2.5" SATA drives</li> <li>4 onboard SATA/NVMe M.2 Support per node</li> <li>Flexible AIOM module per node</li> <li>1 PCI-E add-on cards per node</li> <li>Up to 8 DIMMs per node</li> </ul>
Serverboard	SUPER <sup>•</sup> H12SSFF-AN6	SUPER® H12SSFR-AN6	SUPER® H12SSFR-AN6
System Memory (Max.)	Up to 4TB ECC 3DS LRDIMM, up to DDR4- 3200MHz in 16 DIMMs	Up to 2TB DDR4-3200MHz ECC 3DS LRDIMM in 8 DIMMs	Up to 2TB DDR4-3200MHz ECC 3DS LRDIMM in 8 DIMMs
Expansion Slots	1 PCI-E 4.0 x16 (AIOM); 2 PCI-E 4.0 x16 (LP) per node	FatTwin Rear IO: PCI-E 4.0 x16 LP Riser and PCI-E 4.0 x8 Internal RAID AOC	FatTwin Rear IO: PCI-E 4.0 x16 LP Riser and PCI-E 4.0 x8 Internal RAID AOC
Onboard Storage Controller	N/A	N/A	N/A
Connectivity	AIOM Network Card For Flexible Networking Options (not included, must 1 per Node)	AIOM Network Card For Flexible Networking Options (not included, must add 1 per node)	AIOM Network Card For Flexible Networking Options (not included, must add 1 per node)
VGA/Audio	1 VGA; Aspeed AST2600 BMC per node	Octal set of 1 VGA, Aspeed AST2600 BMC	Octal set of 1 VGA, Aspeed AST2600 BMC
Management	N/A	IPMI 2.0 KVM with dedicated LAN SSM, SUM SuperDoctor® 5 Watch Dog	IPMI 2.0 KVM with dedicated LAN SSM, SUM SuperDoctor® 5 Watch Dog
Drive Bays	2-4x 2.5" SATA3/NVMe drive bays per node	4 hot-swap 2.5" SATA with 2 hot-swap 2.5" SATA/NVMe drive bays per node	8 Hot-swap 3.5" SATA drive bays per node
Peripheral Bays	N/A	N/A	N/A
Power Supply	2000W or above Redundant Power Supplies with PMBus	Redundant 2200W Titanium Level (96%) power supplies (Full redundancy based on configuration and application load)	Redundant 2200W Titanium Level (96%) (Full redundancy based on configuration and application load)
Cooling System	8x 8cm 13.5k RPM rear fans per enclosure	3x 3cm 20K RPM middle fans	2x 80mm heavy duty PWM fans
Form Factor	4U (8-node) Rackmount 448 x 177 x 737mm (17.63" x 6.96" x 29")	4U (8-node) Rackmount 447 x 88 x 730mm (17.6" x 3.47" x 28.75")	4U (4-node) Rackmount 447 x 88 x 730mm (17.6" x 3.47" x 28.75")



# H12TWIN SYSTEMS

BigTwin<sup>®</sup> - 2U 4 DP Nodes

BigTwin<sup>®</sup> - 2U 4 DP Nodes

MODEL	AS -2014TP-HTR	AS -2124BT-HNTR**	AS -2124BT-HTR**
Processor Support	Single AMD EPYC™ 7003 or 7002 Series Processor*	Dual AMD EPYC™ 7003 or 7002 Series Processors*	Dual AMD EPYC™ 7003 or 7002 Series Processors*
Key Applications	<ul> <li>Hyperscale and Hyperconverged Solutions</li> <li>Compute Intensive Application</li> <li>Enterprise Server</li> <li>Data Center</li> <li>HPC</li> </ul>	<ul> <li>Hyperscale and Hyperconverged Solutions</li> <li>Compute Intensive Application</li> <li>Enterprise Server</li> <li>Data Center</li> <li>HPC</li> </ul>	<ul> <li>Hyperscale and Hyperconverged Solutions</li> <li>Compute Intensive Application</li> <li>Enterprise Server</li> <li>Data Center</li> <li>HPC</li> </ul>
Outstanding Features	<ul> <li>Up to 3 3.5" SATA drives per node</li> <li>Up to 8 DIMMs per node</li> <li>Flexible SIOM options</li> <li>M.2 support</li> <li>2 PCI-E add-on cards per node</li> </ul>	<ul> <li>Up to 6 2.5" drives per node (4 NVMe + 2 SATA) or (6 SATA)</li> <li>Up to 16 DIMMs per node</li> <li>Flexible SIOM options</li> <li>M.2 support</li> <li>2 PCI-E add-on cards per node</li> </ul>	<ul> <li>Up to 6 2.5" SATA drives per node</li> <li>Up to 16 DIMMs per node</li> <li>Flexible SIOM options</li> <li>M.2 Support</li> <li>2 PCI-E add-on cards per node</li> </ul>
Serverboard	SUPER® H12SST-PS	SUPER®' H12DST-B	SUPER®' H12DST-B
System Memory (Max.)	Up to 2TB Registered ECC DDR4-3200MHz SDRAM in 8 DIMMs	Up to 4TB DDR4-3200MHz ECC 3DS LRDIMM in 16 DIMMs	Up to 4TB DDR4-3200MHz ECC 3DS LRDIMM in 16 DIMMs
Expansion Slots	2 PCI-E 4.0 X16 (LP), 1 SIOM card support, 4 M.2 SATA/PCI-E slots, 22110/2280/2260/2242, M-key	2 PCI-E 4.0 X16 (LP), 1 SIOM card support , 1 M.2 SATA/PCI-E slot 2280/2210, M-key	2 PCI-E 4.0 x16 (LP), 1 SIOM card support, 1 M.2 SATA/PCI-E slot 2280/2210, M-key
Onboard Storage Controller	SATA3	NVMe and SATA3	SATA3
Connectivity	SIOM Network Card For Flexible Networking Options (not included, must add 1 per node)	SIOM Network Card For Flexible Networking Options (not included, must add 1 per node)	SIOM Network Card For Flexible Networking Options (not included, must add 1 per node)
VGA/Audio	Aspeed AST2500 BMC	Aspeed AST2500 BMC	Aspeed AST2500 BMC
Management	IPMI2.0; KVM with dedicated LAN; SPM; SSM; SUM; SuperDoctor® 5; Watchdog	IPMI2.0; KVM with dedicated LAN; SPM; SSM; SUM; SuperDoctor® 5; Watchdog	IPMI2.0; KVM with dedicated LAN; SPM; SSM; SUM; SuperDoctor® 5; Watchdog
Drive Bays	3 Hot-swap 3.5" SATA drive bays per node	6 hot-swap 2.5" drive bays per node (4 NVMe + 2 SATA) or (6 SATA)	6 hot-swap 2.5" SATA drive bays per node
Peripheral Bays	N/A	N/A	N/A
Power Supply	Redundant 2000W Titanium Level (96%) (Full redundancy based on configuration and application load)	Redundant 2200W Titanium Level (96%) (Full redundancy based on configuration and application load)	Redundant 2200W Titanium Level (96%) (Full redundancy based on configuration and application load)
Cooling System	4x 80mm heavy duty PWM fans	4x 80mm heavy-duty PWM fans	4x 80mm heavy-duty PWM fans
Form Factor	2U (4-Node) Rackmount 438 x 88 x 724mm (17.25" x 3.47" x 28.5")	2U (4-Node) Rackmount 447 x 88 x 730mm (17.6" x 3.47" x 28.75")	2U (4-Node) Rackmount 447 x 88 x 730mm (17.6" x 3.47" x 28.75")

\* AMD EPYC<sup>™</sup> 7003 series processor support requires BIOS version 2.0 or newer \*\* For complete system only

TwinPro<sup>®</sup> - 2U 4 UP Nodes





MODEL	AS -1024US-TRT	AS -1124US-TNRP
Processor Support	Dual AMD EPYC <sup>™</sup> 7003 or 7002 Series Processors*	Dual AMD EPYC <sup>™</sup> 7003 or 7002 Series Processors*
Key Applications	<ul><li>Virtualization</li><li>Cloud Computing</li><li>High End Enterprise Server</li></ul>	<ul><li>Virtualization</li><li>Cloud Computing</li><li>High End Enterprise Server</li></ul>
Outstanding Features	<ul> <li>Optional 4 NVMe ready</li> <li>32 DIMMs</li> <li>3+1 PCI-E add-on cards</li> <li>4x 3.5" SATA/SAS/NVMe drive bays</li> <li>280W CPU support</li> <li>Redundant Titanium Level (96%) power supplies</li> <li>Maximum IO output in 1U platform</li> </ul>	<ul> <li>Maximum IO output in 1U platform</li> <li>32 DIMMs</li> <li>3+1 PCI-E add-on cards</li> <li>12-Port NVMe Gen 4.0/3.0 support</li> <li>280W CPU support</li> <li>Redundant Titanium Level (96%) power supplies</li> <li>Maximum IO output in 1U platform</li> </ul>
Serverboard	SUPER® H12DSU-iN	SUPER® H12DSU-iN
System Memory (Max.)	32x DIMM slots, Up to 8TB ECC 3DS LRDIMM, Up to 3200 MHz	32x DIMM slots, Up to 8TB ECC 3DS LRDIMM, Up to 3200 MHz
Expansion Slots	2 PCI-E x16 (FH /9.5"L) slots; 1 PCI-E x16 slot (LP); 1 PCI-E x16 slot (internal LP)	2 PCI-E x16 (FH /9.5"L) slots; 1 PCI-E x16 slot (LP); 1 PCI-E x16 slot (internal LP)
Onboard Storage Controller	4 SATA3 (6 Gbps) ports; Optional 4 SAS3 drives support VS additional option parts or Optional 4 NVMe drives support vs addition NVMe trays required.	12 hot-Swappable U.2 drives support; Optional 12 SAS3 /12SATA support with additional SAS/SATA Kit
Connectivity	Dual 10GBase-T RJ45 LAN ports via Intel Carlsville X710-AT2; 3 USB 3.0 ports (2 rear, 1 Type A)	Dual port 10G RJ45 & dual port 10G SFP+, Intel Carlsville X710-TM4; 4 USB 3.0 ports (1 front, 2 rear, 1 Type A)
VGA/Audio	1 VGA; 1 ASPEED AST2500 BMC	1 VGA; 1 ASPEED AST2500 BMC
Management	Built-in Server management tool (IPMI 2.0, KVM/media over LAN) with dedicated LAN port	Built-in Server management tool (IPMI 2.0, KVM/media over LAN) with dedicated LAN port
Drive Bays	4x hot-swap 3.5" drive bays support	12x hot-swap 2.5" drives support
Peripheral Bays	N/A	N/A
Power Supply	1000W Redundant Titanium Level (96%+) power supplies (Full redundancy based on configuration and application load)	1200W Redundant Titanium Level (96%) power supplies (Full redundancy based on configuration and application load)
Cooling System	8 heavy-duty fans w/ Optimal Fan Speed Control	8 heavy-duty fans w/ optimal Fan Speed Control
Form Factor	437 x 43 x 754mm (17.2" x 1.7" x 29.7")	1U Rackmount 437 x 43 x 724mm (17.2" x 1.7" x 28.5")



#### 2U Ultra, 8TB DDR4



2U Ultra, 24 NVMe



MODEL	AS -2024US-TRT	AS -2124US-TNRP
Processor Support	Dual AMD EPYC™ 7003 or 7002 Series Processors*	Dual AMD EPYC™ 7003 or 7002 Series Processors*
Key Applications	<ul> <li>Virtualization</li> <li>Cloud Computing</li> <li>High End Enterprise Server</li> <li>Hyperconverge Storage</li> </ul>	<ul> <li>Virtualization</li> <li>Cloud Computing</li> <li>High End Enterprise Server</li> <li>Hyperconverge Storage</li> </ul>
Outstanding Features	<ul> <li>32 DIMMs</li> <li>5+1 PCI-E add-on cards</li> <li>12x 3.5" SATA/SAS (SAS via AOC)/support up to 4 NVMe</li> <li>280W CPU support</li> <li>1600W redundant Titanium Level (96%) power supplies</li> <li>Maximum IO output in 2U platform</li> </ul>	<ul> <li>32 DIMMs</li> <li>1 PCI-E add-on cards</li> <li>24x 2.5" hot-swap NVMe drive bays</li> <li>280W CPU support</li> <li>1600W redundant Titanium Level (96%) power supplies</li> <li>Maximum IO output in 2U platform</li> </ul>
Serverboard	SUPER <sup>®</sup> H12DSU-iN	SUPER <sup>®</sup> H12DSU-iN
System Memory (Max.)	32 DIMM slots, Up to 8TB ECC 3DS LRDIMM, Up to 3200 MHz	32 DIMM slots, Up to 8TB ECC 3DS LRDIMM, Up to 3200 MHz
Expansion Slots	2 PCI-E 4.0 x16 slots (FH, 10.5" L); 1 PCI-E 4.0 x16 slot (FH, 9.5" L); 1 PCI-E 4.0 x16 slot (LP); 1 PCI-E 4.0 x8 slot (FH, 9.5" L, in x16 slot); 1 PCI-E 4.0 x8 slot (internal LP, in x16 slot)	I PCI-E 4.0 x16 slot (FH, 9.5" L)
Onboard Storage Controller	8 SATA3 (6 Gbps) ports + 4 hybrid SATA/NVMe function ready for HDD slots 0~3 with additional NVMe HDD trays for NMVe drives; Optional 12 SAS3 drive support VS SAS card with cables	24x Hot-Swappable U.2 drive bays support with optional up to 24x SAS3 drive bays support VS SAS card and cables
Connectivity	Dual port 10G RJ45, Intel Carlsville X710-AT2; 4 USB 3.0 ports (1 front, 2 rear, 1 Type A)	Dual 10G RJ45 & Dual 10G SFP+ ports, Intel Carlsville X710-TM4 3 USB 3.0 ports (2 rear, 1 Type A)
VGA/Audio	1 VGA; 1 ASPEED AST2500 BMC	1 VGA; 1 ASPEED AST2500 BMC
Management	Built-in Server management tool (IPMI 2.0, KVM/media over LAN) with dedicated LAN port	Built-in Server management tool (IPMI 2.0, KVM/media over LAN) with dedicated LAN port
Drive Bays	12x hot-swap 3.5" drive bays support	24x hot-swap 2.5" drive bays support
Peripheral Bays	2x 2.5" peripheral drive bays with additional rear drive bay kits + cable	N/A
Power Supply	1600W redundant Titanium Level (96%+) power supplies (Full redundancy based on configuration and application load)	1600W redundant Titanium Level (96%) power supplies (Full redundancy based on configuration and application load)
Cooling System	4x heavy-duty fans w/ optimal Fan Speed Control	4x heavy-duty fans w/ optimal Fan Speed Control
Form Factor	437 x 89 x 723mm (17.2" x 3.5" x 28.46")	2U Rackmount 437 x 89 x 723mm (17.2" x 3.5" x 28.46")





	Cost Effective 1U	Cost Effective 2U
MODEL	AS -1114CS-TNR	AS -2014CS-TR
Processor Support	Single AMD EPYC™ 7003 or 7002 Series Processor*	Single AMD EPYC™ 7003 or 7002 Series Processor*
Key Applications	<ul> <li>Financial Services</li> <li>Cloud Computing</li> <li>Network Appliance</li> <li>Private Cloud</li> <li>Content Delivery Network (CDN)</li> <li>Deep Learning Inferencing</li> </ul>	<ul> <li>Financial Services</li> <li>Cloud Computing</li> <li>Network Appliance</li> <li>Private Cloud</li> <li>Content Delivery Network (CDN)</li> <li>Deep Learning Inferencing</li> </ul>
Outstanding Features	<ul> <li>Dual AIOM slots for flexible networking</li> <li>2x PCI-E 4.0 x16 FH/HL slots</li> <li>860W redundant Platinum Level power supplies</li> <li>Tool-less drive trays and tool-less brackets</li> <li>280W CPU support</li> <li>16 DIMMs</li> </ul>	<ul> <li>Dual AIOM slots for flexible networking</li> <li>4x PCI-E 4.0 x16 (2 FH, 10.5"L) or 2x PCI-E 4.0 x16 FH/HL + 4x PCI-E 4.0 x8 FH/HL slots</li> <li>920W redundant Platinum Level high-efficiency power supplies</li> <li>Tool-less drive trays and tool-less brackets</li> <li>280W CPU support</li> <li>16 DIMMs</li> </ul>
Serverboard	SUPER® H12SSW-AN6	SUPER® H12SSW-AN6
System Memory (Max.)	16 DIMM slots, Up to 4TB ECC 3DS LRDIMM, Up to 3200 MHz	16 DIMM slots, Up to 4TB ECC 3DS LRDIMM, Up to 3200 MHz
Expansion Slots	2 PCI-E 4.0 x16 (FH/HL)	4 PCI-E 4.0 x16 (2 FH, 10.5"L) or 2 PCI-E 4.0 x16 (FH/HL) + 4 PCI-E 4.0 x8(2 FH/HL, 2 FH/HL)
Onboard Storage Controller	10x hot-swappable SATA drives bays support; Optional 10x SAS3/ NVMe support with additional SAS/NVMe kit	12x 3.5" SATA /SAS (SAS via AOC)/NVMe drive bays with optional kit + 2x 2.5" (with optional kit)
Connectivity	Dual AIOM slots, 2 USB 3.0 ports (2 rear)	Dual AIOM slots, 2 USB 3.0 ports (2 rear)
VGA/Audio	1 VGA; 1 ASPEED AST2600 BMC	1 VGA; 1 ASPEED AST2600 BMC
Management	Built-in Server management tool (IPMI 2.0, KVM/media over LAN) with dedicated LAN port	Built-in Server management tool (IPMI 2.0, KVM/media over LAN) with dedicated LAN port
Drive Bays	10x hot-swap 2.5" drive bays support	12x hot-swap 3.5" drive bays support
Peripheral Bays	N/A	2x 2.5" Peripheral drive bays with additional rear drive bay kits + cable
Power Supply	860W redundant Platinum Level high-efficiency power supplies	920W redundant Platinum Level high-efficiency power supplies
Cooling System	6x 40x40x56mm counter-rotation PWM fans	3x 80x80x38mm middle cooling fans
Form Factor	1U Rackmount 437 x 43 x 597mm (17.2" x 1.7" x 23.5")	2U Rackmount 437 x 89 x 648mm (17.2" x 3.5" x 25.5")
* AMD FPYC™ 7003 sei	ries processor support requires BIOS version 2.0 or newer	

# H12 SUPERBLADE®







MODEL	SBA-4114S-C2N	SBA-4114S-T2N	SBA -4119SG
Processor Support	Single AMD EPYC™ 7003 or 7002 Series Processor*; TDP up to 280W	Single AMD EPYC™ 7003 or 7002 Series Processor*; TDP up to 280W	Single AMD EPYC™ 7003 or 7002 Series Processor*; TDP up to 280W
Key Applications	<ul> <li>Resource saving and high density</li> <li>Data center</li> <li>HPC</li> <li>EDA</li> </ul>	<ul> <li>Resource saving and high density</li> <li>Data center</li> <li>HPC</li> <li>EDA</li> </ul>	<ul> <li>Resource saving and high density</li> <li>Data center</li> <li>HPC</li> <li>Cloud Gaming, Inference</li> </ul>
Outstanding Features	<ul> <li>2x hot-plug 2.5" NVMe/SAS3/SATA3 drive bays</li> <li>2 NVMe/SATA M.2</li> <li>2x 25G on board</li> <li>Flexible AIOM module per node</li> </ul>	<ul> <li>2x hot-plug 2.5" NVMe/SATA3 drive bays</li> <li>2 NVMe/SATA M.2</li> <li>2x 25G on board</li> <li>Flexible AIOM module per node</li> </ul>	<ul> <li>1 NVMe/SATA M.2</li> <li>2 PCI-E 4.0 x16 slots</li> <li>2x 25G on board</li> </ul>
Serverboard	MBD-BH12SSI-M25	MBD-BH12SSI-M25	MBD-BH12SSI-M25
System Memory (Max.)	Up to 2TB DDR4-3200MHz RDIMM	Up to 2TB DDR4-3200MHz RDIMM	Up to 2TB DDR4-3200MHz RDIMM
Expansion Slots	N/A	N/A	2 PCI-E 4.0 x16
Onboard Storage Controller	Broadcom 3108	AMD SP3	AMD SP3
Connectivity	25G Ethernet/100G EDR/200G HDR; Optional AIOM Network Card	25G Ethernet/100G EDR/200G HDR; Optional AIOM Network Card	25G Ethernet/100G EDR/200G HDR
VGA/Audio	N/A	N/A	N/A
Management	IPMI 2.0, KVM over IP, Virtual Media over LAN	IPMI 2.0, KVM over IP, Virtual Media over LAN	IPMI 2.0, KVM over IP, Virtual Media over LAN
Drive Bays	2x hot-plug 2.5″ NVMe/SAS3/SATA3 drive bays; 2x M.2 NVMe/SATA3	2x hot-plug 2.5″ NVMe/SATA3 drive bays; 2x M.2 NVMe/SATA3	1x M.2 NVMe/SATA3
Peripheral Bays	N/A	N/A	N/A
Power Supply	N/A	N/A	N/A
Cooling System	Passive HS for CPU	Passive HS for CPU	Passive HS for CPU
Super Blade Enclosures	820C 820H 820J 820L	820C 820H 820J 820L	820C 820H 820J 820L

# H12 SUPERBLADE®

#### Up to 20 hot-plug server blades

#### Up to 20 hot-plug server blades



Rear View

Rear View

MODEL	SBE-820C	SBE-820J
Server Blade	Up to 20 hot-plug server blades	Up to 20 hot-plug server blades
Module Support	Supports: • SBA-4114S-C2N • SBA-4114S-T2N • SBA-4119SG	Supports: • SBA-4114S-C2N • SBA-4114S-T2N • SBA-4119SG
LED	<ul><li>Fault LED</li><li>Power LED</li></ul>	<ul><li>Fault LED</li><li>Power LED</li></ul>
InfiniBand Switch	1x 100G EDR IB or OPA switch	N/A
Gigabit Ethernet Switch	Up to 2 hot-plug 25G Ethernet Switches	Up to 4 hot plug 25G Ethernet switch
Management Module	1 hot-plug management module providing remote KVM and IPMI 2.0 functionalities	2 hot-plug management modules providing remote KVM and IPMI 2.0 functionalities
Power Supply	4/6/8 hot-swap 2200W power supplies, up to N+N redundancy, 4 pcs of 1200W BBP, 3 optional cooling fan modules(PWS-DF005-2F)	4/6/8 hot-swap 2200W power supplies, up to N+N redundancy, 4 pcs of 1200W BBP, 3 optional cooling fan modules(PWS-DF005-2F)
Cooling Design	Front to back	Front to back
Dimensions (HxWxD)	356 x 447 x 812.8mm (14" x 17.6" x 32")	356 x 447 x 812.8mm (14″ x 17.6″ x 32″)

# H12 SUPERBLADE®

#### Up to 20 hot-plug server blades

#### Up to 20 hot-plug server blades



**Rear View** 

Rear View

MODEL	SBE-820L	SBE-820H
Server Blade	Up to 20 hot-plug server blades	Up to 20 hot-plug server blades
Module Support	Supports: • SBA-4114S-C2N • SBA-4114S-T2N • SBA-4119SG	Supports: • SBA-4114S-C2N • SBA-4114S-T2N • SBA-4119SG
LED	<ul><li>Fault LED</li><li>Power LED</li></ul>	<ul><li>Fault LED</li><li>Power LED</li></ul>
InfiniBand Switch	N/A	1x 200G HDR IB switch
Gigabit Ethernet Switch	Up to 2 hot-plug 10G Ethernet Switches	Up to 2 hot-plug 25G Ethernet Switches
Management Module	1 hot-plug CMM (Central Management Modules) providing remote KVM and IPMI 2.0 functionalities	1 hot-plug management modules providing remote KVM and IPMI 2.0 functionalities
Power Supply	4/6/8pcs hot-swap 2200W power supplies, up to N+N redundancy, 3 optional cooling fan modules (PWS-DF005-2F)	4/6/8 hot-swap 2200W power supplies, up to N+N redundancy, 4 pcs of 1200W BBP, 3 optional cooling fan modules(PWS-DF005-2F)
Cooling Design	Front to back	Front to back
Dimensions (HxWxD)	356 x 447 x 812.8mm (14″ x 17.6″ x 32″)	356 x 447 x 812.8mm (14" x 17.6" x 32")



# H11 MAINSTREAM

1U UP





MODEL	AS -1013S-MTR	AS -2013S-COR
Processor Support	Single AMD EPYC™ 7002 and 7001 Series Processor; TDP up to 200W	Single AMD EPYC™ 7002 and 7001 Series Processor; TDP up to 200W
Key Applications	<ul> <li>Web Hosting, VM</li> <li>Cloud Computing</li> <li>Connectivity/Storage Computer Nodes</li> </ul>	<ul> <li>Cloud and Virtualization needs</li> <li>Connectivity/Storage Computer Nodes</li> <li>Database Processing &amp; Storage</li> <li>Hosting &amp; Application delivery</li> </ul>
Outstanding Features	<ul> <li>Up to 4 hot-swap 3.5" drives</li> <li>Up to 1TB DDR4 ECC RDIMM</li> <li>1x M.2 Support by default</li> <li>2 SATA DOMs Support with Embedded Power</li> </ul>	<ul> <li>Up to 6 add-on cards</li> <li>8 Hot-Swap 3.5" SATA/SAS drive bays</li> <li>Broadcom<sup>®</sup> 3008 controller onboard</li> <li>1x M.2 Support by default</li> <li>740W Redundant Platinum Level high-efficiency power supplies</li> </ul>
Serverboard	SUPER <sup>®</sup> H11SSL-i	SUPER <sup>•</sup> H11SSL-C
System Memory (Max.)	Supports up to 1TB Registered ECC DDR4 2666MHz SDRAM in 8 DIMMs	Supports up to 1TB Registered ECC DDR4 2666MHz SDRAM in 8 DIMMs
Expansion Slots	1 PCI-E 3.0 x16 (FH/HL) slot	3 PCI-E 3.0 x16 (low profile); 3 PCI-E 3.0 x8 (low profile)
Onboard Storage Controller	N/A	Broadcom 3008 SAS3 (12 Gbps) controller for 8 SAS3 (12 Gbps) ports; RAID 0,1,10 SATA3 (6 Gbps)8 SATA3 (6 Gbps) ports
Connectivity	2 1GbE RJ45 LAN ports via Intel® I210; 5 USB 3.0 ports (4 rear, 1 Type A)	2 1GbE RJ45 LAN ports via Intel® I210; 5 USB 3.0 ports (4 rear, 1 Type A)
VGA/Audio	1 VGA 1 Aspeed AST2500 BMC	1 VGA 1 Aspeed AST2500 BMC
Management	Built-in Server management tool (IPMI 2.0, KVM/media over LAN) with dedicated LAN port	Built-in Server management tool (IPMI 2.0, KVM/media over LAN) with dedicated LAN port
Drive Bays	4x 3.5" hot-swap SATA drive bay	8x 3.5" hot-swap SAS/SATA drive bay
Peripheral Bays	Optional 1x Slim DVD-ROM Drive bay	Optional 1x Slim DVD-ROM Drive bay
Power Supply	400W Redundant Platinum Level Power Supplies (Full redundancy based on configuration and application load)	740W Redundant Platinum Level high-efficiency Power Supplies (Full redundancy based on configuration and application load)
Cooling System	4 heavy duty fans w/ Optimal Fan Speed Control	3 heavy duty fans w/ Optimal Fan Speed Control
Form Factor	1U Rackmount 437 x 43 x 504mm (17.2" x 1.7" x 19.85")	437 x 89 x 648mm (17.2" x 3.5" x 25.5")

# H12/H11TOWER

Z

**SuperWorkstation** 

MODEL	AS -3014TS-i	AS -4023S-TRT	AS -5014A-TT
Processor Support	Single AMD EPYC™ 7003 or 7002 Series Processors*; TDP up to 280W	Dual AMD EPYC™ 7001/7002 Series Processors	AMD Ryzen™ Threadripper™ PRO 3000WX Series Processor, up to 64 Cores
Key Applications	<ul><li>Entry-Level Worksation</li><li>Video and Music Production</li><li>Office Applications</li></ul>	<ul> <li>GPU accelerated compute</li> <li>Cloud Computing</li> <li>Data Center</li> <li>General purpose, SMB, Web Hosting</li> </ul>	<ul> <li>Media and Entertainment Content Creation</li> <li>Product Design and Engineering Simulation</li> <li>Al and Deep Learning</li> </ul>
Outstanding Features	<ul> <li>4x 3.5" internal SATA HDD Bays</li> <li>Up to 2TB DDR4 ECC RDIMM</li> <li>2x 1GbE LAN</li> <li>2x M.2 Support by default</li> </ul>	<ul> <li>Tower or 4U Rackmount System</li> <li>Dual GPU support</li> <li>16 DIMMs</li> <li>M.2 Support</li> </ul>	<ul> <li>5U Rackmountable / Tower</li> <li>6 PCI-E 4.0 x16 slots</li> <li>M.2 Support</li> <li>10GBase-T LAN port, 1x 1GbE LAN port</li> </ul>
Serverboard	SUPER <sup>®</sup> H12SSL-i	SUPER <sup>®</sup> H11DSi-NT	SUPER <sup>®</sup> M12SWA-TF
System Memory (Max.)	Up to 2TB 3DS ECC RDIMM/LRDIMM; DDR4- 3200MHz, in 8 DIMMs	2TB DDR4-2666MHz, in 16 DIMMs	Up to 2TB Registered ECC DDR4-3200MHz Memory, in 8 DIMMs
Expansion Slots	5 PCI-E 4.0 x16, 2 PCI-E 4.0 x8	2 PCI-E 3.0 x16, 3 PCI-E 3.0 x8, 1 M.2 PCI-E slot 2280/2210, M-key; 1 M.2 PCI-E slot 2280/2210; M-Key	6 PCI-E 4.0 x16 slots M.2 Interface: 4 PCI-E 4.0 x4, RAID 0, 1, 5 & 10 M.2 Form Factor: 2280, 22110 M.2 Key: M-Key
Onboard Storage Controller	4x internal 3.5" SATA3 drives support; 4x 2.5" SATA3 drives support	10 SATA3 (6 Gbps) ports	4 SATA3 (6Gbps) ports; RAID 0, 1, 5, 10
Connectivity	2 GBase-T Ethernet via Broadcom BCM5720 Controller; 5 USB 3.0 ports (4 rear, 2 via header)	Dual 10GBase-T LAN Ports	10GBase-T LAN port, 1x 1GbE LAN port (shared with IPMI)
VGA/Audio	1 VGA; 1 Aspeed AST2500 BMC	1 VGA; 1 Aspeed AST2500 BMC	1 VGA port (dedicated for IPMI); 7.1 HD Audio
Management	Built-in Server management tool (IPMI 2.0, KVM/media over LAN) with dedicated LAN port	IPMI2.0; KVM with dedicated LAN; SPM; SSM; SUM; SuperDoctor® 5; Watchdog	Intel® Node Manager, IPMI 2.0, SSM, SPM, SUM, SuperDoctor® 5, Watchdog
Drive Bays	4x internal 3.5" SATA3 drive bays; 4x 2.5" SATA3 drives support	8x 3.5" hot-swap SATA drive bays; optional SAS and NVMe support with optional kits; Optional SAS and NVMe support with optional kit	4x internal fixed 3.5"/2.5" SATA3 drive bays; 2x front fixed 2.5" SATA3 drive bays
Peripheral Bays	N/A	3x 5.25" drive bays	2x 5.25" drive bays
Power Supply	900W redundant Gold Level power supplies	1280W redundant Platinum Level power supplies	2000W Platinum Level power supply
Cooling System	2 system fans w/ optimal Fan Speed control	3x internal hot-swap 9400 RPM fans; 2x external rear hot-swap 9400 RPM fans	1x 12cm rear exhaust fan, 3x 12cm front cooling fans (optional), 3x 12cm top cooling fans (optional) ; Optional high-performance closed-loop water cooling for CPU
Form Factor * AMD EPYC <sup>™</sup> 7003 ser	Mid-Tower 193 x 424 x 525mm (7.6" x 16.7" x 20.68") ries processor support requires BIOS version 2.0 or neu	4U Tower 178 x 452 x 648mm (7" x 17.8" x 25.5") <i>wer</i>	5U Rackmountable / Tower 222 x 535 x 573 mm (21.06" x 8.74" x 22.56")

# H12WIO

#### 1U UP WIO

#### 1U 10NVMe, UP WIO

#### 1U UP WIO







MODEL	AS -1014S-WTRT	AS -1114S-WN10RT**	AS -1114S-WTRT
Processor Support	Single AMD EPYC™ 7003 or 7002 Series Processor*; TDP up to 240W	Single AMD EPYC™ 7003 or 7002 Series Processor*; TDP up to 280W	Single AMD EPYC™ 7003 or 7002 Series Processor*; TDP up to 240W
Key Applications	<ul> <li>Database Processing &amp; Storage</li> <li>Data Center</li> <li>FireWall Applications</li> </ul>	<ul><li>Virtualization</li><li>Cloud Computing</li><li>All Flash Storage</li></ul>	<ul> <li>Database Processing &amp; Storage</li> <li>Data Center</li> <li>FireWall Applications</li> </ul>
Outstanding Features	<ul> <li>Support up to 3 PCI-E cards</li> <li>Up to 2TB DDR4 ECC RDIMM</li> <li>Dual 10GBaseT LAN ports</li> <li>2x M.2 support by default</li> <li>2 SATA DOMs support with embedded power</li> </ul>	<ul> <li>10-Port NVMe SSD support</li> <li>Up to 4TB DDR4 ECC RDIMM</li> <li>Dual 10GBaseT LAN ports</li> <li>2x M.2 Support by default</li> <li>2 SATA DOMs support with embedded power</li> <li>10 Gen4/ Gen3 U.2 NVMe SSD support</li> </ul>	<ul> <li>Support up to 3 PCI-E cards</li> <li>Up to 2TB DDR4 ECC RDIMM</li> <li>Dual 10GBaseT LAN Ports</li> <li>2x M.2 Support by default</li> <li>2 SATA DOMs Support with Embedded Power</li> </ul>
Serverboard	SUPER® H12SSW-iN	SUPER® H12SSW-NTR	SUPER® H12SSW-IN
System Memory (Max.)	Up to 2TB 3DS ECC RDIMM/LRDIMM; DDR4 up to 3200MHz, in 8 DIMM slots	Up to 4TB 3DS ECC RDIMM/LRDIMM; DDR4 up to 3200MHz, in 16 DIMM slots	Up to 2TB 3DS ECC RDIMM/LRDIMM; DDR4 up to 3200MHz, in 8 DIMM slots
Expansion Slots	2 PCI-E 4.0 x16 (FH/HL) slots, 1 PCI-E 4.0 x16 (LP) slot	2 PCI-E 4.0 x16 (FH/HL) slots, 1 PCI-E 4.0 x16 (LP) slot	2 PCI-E 4.0 x16 (FH/HL) slots, 1 PCI-E 4.0 x16 (LP) slot
Onboard Storage Controller	4 Hot-Swappable 3.5" SATA drive support; Optional 4 U.2 NVMe (PCI-E Gen 3) drive support vs additional NVMe cables required	10 Hot-Swappable U.2 NVMe drive support; Optional 10 SATA3 drive support vs additional SATA cables required	10 Hot-Swappable 2.5" SATA drive support; Optional 2 U.2 NVMe (PCI-E Gen 3) drive support vs additional NVMe cables required
Connectivity	2 10GBase-T Ethernet via Broadcom BCM57416 Controller; 7 USB 3.0 ports (4 rear, 2 front, 1 Type A)	2 10GBase-T Ethernet via Broadcom BCM57416 Controller; 7 USB 3.0 ports (4 rear, 2 front, 1 Type A)	2 10GBase-T Ethernet via Broadcom BCM57416 Controller; 7 USB 3.0 ports (4 rear, 2 front, 1 Type A)
VGA/Audio	1 VGA 1 Aspeed AST2500 BMC	1 VGA 1 Aspeed AST2500 BMC	1 VGA 1 Aspeed AST2500 BMC
Management	Built-in Server management tool (IPMI 2.0, KVM/media over LAN) with dedicated LAN port; Software Out of Band License key (SFT-OOB-LIC) included for OOB BIOS management	Built-in Server management tool (IPMI 2.0, KVM/media over LAN) with dedicated LAN port	Built-in Server management tool (IPMI 2.0, KVM/media over LAN) with dedicated LAN port; Software Out of Band License key (SFT-OOB-LIC) included for OOB BIOS management
Drive Bays	4 Hot-Swappable 3.5" SATA drive support; Optional 4 U.2 NVMe (PCI-E Gen 3) drive support vs additional NVMe cables required	10 Hot-Swappable U.2 NVMe drive support; Optional 10 SATA3 drive support vs additional SATA cables required	10 Hot-Swappable 2.5" SATA drive support; Optional 2 U.2 NVMe (PCI-E Gen 3) drive support vs additional NVMe cables required
Peripheral Bays	Optional to support 1x Slim DVD-ROM Drive	N/A	N/A
Power Supply	500W Redundant Power Supplies Platinum Level (94%) (Full redundancy based on configuration and application load)	750W Redundant Power Supplies Platinum Level (94%) (Full redundancy based on configuration and application load)	500W Redundant Power Supplies Platinum Level (94%) (Full redundancy based on configuration and application load)
Cooling System	4 heavy duty fans w/ Optimal Fan Speed Control, Additional 1 heavy duty fan support w/ Optimal Fan Speed Control	6 heavy duty fans w/ Optimal Fan Speed Control	4 heavy duty fans w/ Optimal Fan Speed Control, Additional 1 heavy duty fan support w/ Optimal Fan Speed Control
Form Factor	1U Rackmount 437 x 43 x 650mm (17.2" x 1.7" x 25.6")	437 x 43 x 597mm (17.2" x 1.7" x 23.5")	437 x 43 x 597mm (17.2" x 1.7" x 23.5")

\* AMD EPYC<sup>™</sup> 7003 series processor support requires BIOS version 2.0 or newer \*\* For complete system only

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# H12WIO/STORAGE

#### 2U UP WIO

High Capacity Storage





MODEL	AS -2114S-WN24RT	ASG-1014S-ACR12N4H
Processor Support	Single AMD EPYC™ 7003 or 7002 Series Processor*; TDP up to 280W	Single AMD EPYC™ 7003 or 7002 Series Processor*
Key Applications	<ul> <li>Virtualization</li> <li>Hyperconverge Storage</li> <li>Cloud Computing</li> <li>All Flash Storage</li> </ul>	<ul> <li>Object Storage</li> <li>Scale-Out Density</li> <li>Database Applications</li> <li>Hadoop &amp; Ceph storage solutions</li> </ul>
Outstanding Features	<ul> <li>24-Port NVMe SSD Support</li> <li>Up to 4TB DDR4 ECC RDIMM</li> <li>Dual 10GBaseT LAN Ports</li> <li>2x M.2 Support by default</li> <li>2 SATA DOMs Support with Embedded Power</li> </ul>	<ul> <li>12x 3.5" hot-swap SAS3/SATA3 drive bays with Broadcom 3916 SAS3 IR mode controller</li> <li>16x 4TB Registered ECC DDR4 3200MHz SDRAM</li> <li>4x 2.5" 7mm hot-swap NVMe/SATA drive bays</li> <li>3 PCI-E 4.0 x16 slots</li> <li>2x 10GBase-T LAN Ports via Broadcom BCM57416 and 2x M.2 NVMe up to 110mm</li> <li>Internal Cable Arm</li> </ul>
Serverboard	SUPER® H12SSW-NTR	SUPER <sup>•</sup> H12SSW-NTR
System Memory (Max.)	Up to 4TB 3DS ECC RDIMM/LRDIMM; DDR4 up to 3200MHz, in 16 DIMM slots	Up to 4TB 3DS ECC RDIMM/LRDIMM; DDR4 up to 3200MHz, in 16 DIMMs
Expansion Slots	1 PCI-E 4.0 x16 (FH/HL)	2 PCI-E 4.0 x16 (FHHL); 1 PCI-E 4.0 x8 (LP)
Onboard Storage Controller	24 Hot-Swappable U.2 NVMe drive support	NVMe/SATA drive bays via CPU
Connectivity	2 10GBase-T Ethernet via Broadcom BCM57416 Controller; 5 USB 3.0 ports (4 rear, 1 Type A)	2 10GBase-T Ethernet via Broadcom BCM57416 Controller; 5 USB 3.0 ports (4 rear, 1 Type A)
VGA/Audio	1 VGA 1 Aspeed AST2500 BMC	1 VGA; 1 ASPEED AST2600 BMC
Management	Built-in Server management tool (IPMI 2.0, KVM/media over LAN) with dedicated LAN port	Built-in Server management tool (IPMI 2.0, KVM/media over LAN) with dedicated LAN port
Drive Bays	24 Hot-Swappable U.2 NVMe drive support	12x 3.5" SAS/SATA drive bays; 4x 7mm 2.5" NVMe/SATA drive bays
Peripheral Bays	N/A	N/A
Power Supply	1200W Redundant Power Supplies Titanium Level (96%) (Full redundancy based on configuration and application load)	800W redundant Platinum Level high-efficiency power supplies
Cooling System	3 heavy duty fans w/ Optimal Fan Speed Control	6x 40x40x56mm counter-rotation PWM fans
Form Factor	2U Rackmount 437 x 89 x 630mm (17.2" x 3.5" x 24.8")	1U Rackmount 447 x 43 x 940mm (17.6" x 1.7" x 37")



# H12 MOTHERBOARDS

#### ATX Mainstream

#### EATX Mainstream





	· BBCCI · · · B	
MODEL	H12SSL-i H12SSL-C H12SSL-CT H12SSL-NT	H12DSi-N6 H12DSi-NT6
Processor	Single AMD EPYC™ 7003 or 7002 Series Processor*	Dual AMD EPYC™ 7003 or 7002 Series Processors*
Chipset	System on Chip	System on Chip
Form Factor	ATX 12" x 9.6"	EATX 12" x 13.05"
Memory Capacity & Slots	2 TB ECC Registered, DDR4-3200MHz SDRAM in 8 DIMMs	4 TB ECC Registered, DDR4-3200MHz SDRAM in 16 DIMMs
Expansion Slots	5 PCI-E 4.0 x16 2 PCI-E 4.0 x8 M.2 Interface: 2 PCI-E 4.0 x4 M.2 Form Factor: 22110, 2280 M.2 Key: M-Key	3 PCI-E 4.0 x16 3 PCI-E 4.0 x8 M.2 Interface: 1 PCI-E 4.0 x4 M.2 Form Factor: 22110, 2280 M.2 Key: M-Key
Onboard RAID Controller	-C: Broadcom 3008 SAS3 (12 Gbps) controller for 8 SAS3 (12 Gbps) ports; RAID 0,1,10 -CT: Broadcom 3008 SAS3 (12 Gbps) controller for 8 SAS3 (12 Gbps) ports; RAID 0,1,10	10 SATA3 (6 Gbps) ports
Onboard LAN	-i: Dual LAN with Broadcom BCM5720L Gigabit Ethernet Controller -C: Dual LAN with Broadcom BCM5720L Gigabit Ethernet Controller -CT: Dual LAN with Broadcom BCM57416 10GBase-T Ethernet Controller -NT: Dual LAN with Broadcom BCM57416 10GBase-T Ethernet Controller	-N6: Dual LAN with Broadcom BCM5720L Gigabit Ethernet Controller -NT6: Dual LAN with Broadcom BCM57416 10GBase-T Ethernet Controller
Onboard VGA	1 VGA; Aspeed AST2500 BMC	1 VGA; Aspeed AST2600 BMC
USB Ports	6 USB 3.0 ports (4 rear + 2 headers)	2 USB 2.0 ports (2 rear) 4 USB 3.0 ports (2 rear + 2 headers)
Other Onboard I/O Devices	1 COM Ports SATA DOM power connector TPM 1.2/ 2.0 header -i: 1 PCI-E 4.0 NVMe x4 Internal Port -NT: 2 PCI-E 4.0 NVMe x4 Internal Ports	1 COM Ports SATA DOM power connector TPM 1.2/ 2.0 header 4 PCI-E 4.0 NVMe x4 Internal Ports
Manageability	IPMI (Intelligent Platform Management Interface) v2.0 with KVM support, IPMI2.0, KVM with dedicated LAN, SPM, SSM, SUM, SuperDoctor® 5, Watchdog	IPMI (Intelligent Platform Management Interface) v2.0 with KVM support, IPMI2.0, KVM with dedicated LAN, SPM, SSM, SUM, SuperDoctor® 5
PC Health Monitoring	+3.3V, +5V, +5V standby, 3.3V standby, Monitors CPU voltages, Supports system management utility, VBAT	+12V, +3.3V, +5V, +5V standby, Chassis intrusion header, CPU temperature, LAN temperature, Memory temperature, Memory Voltages, Monitors CPU voltages
Thermal Control	7x fan header, 4-pin type of fan header, 7 fans with tachometer status monitoring, Dual Cooling Zone, Pulse Width Modulated (PWM) fan connectors, Status monitoring for speed control	8x fan header, 4-pin type of fan header, Dual Cooling Zone, Fan speed control, Overheat LED indication, PWM fan speed control
Other Features	ACPI power management, Control of power-on for recovery from AC power loss, CPU thermal trip support for processor protection, UID	ACPI power management, Control of power-on for recovery from AC power loss, CPU thermal trip support for processor protection, UID, WOL
BIOS	AMI 256Mb Flash EEPROM	AMI 256Mb Flash EEPROM
* 4440 50//CIM 7002		



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