



Product Brief

Intel® Entry Server Board SE7230NH1-E

- Support for Dual-Core Processors
- Intel® E7230 Server Chipset
- Support for Dual-Channel DDR2 SDRAM

Intel® Entry Server Board SE7230NH1-E

Essential server-class features for general-purpose entry-level server applications



Dual-core Intel® processors, with a system bus of up to 1066 MHz and support for Hyper-Threading Technology¹ and Intel® EM64T², provide excellent performance and value for entry-level applications.



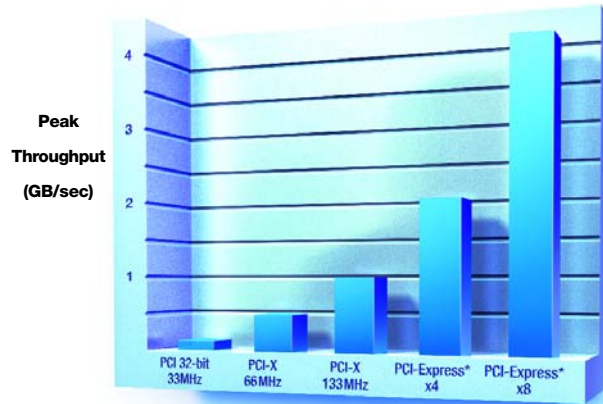
Intel® Entry Server Board SE7230NH1-E

Uniprocessor systems are vital for entry-level server applications in businesses where budget factors must be considered alongside performance, reliability, and scalability. Now, businesses can place more consideration on performance as a purchase factor, thanks to the introduction of the Intel® Entry Server Board SE7230NH1-E supporting dual-core processing.

By basing servers on the Intel Entry Server Board SE7230NH1-E supporting dual-core processors and a system bus of up to 1066 MHz, businesses can achieve performance without sacrificing cost-effectiveness or reliability. Other performance advantages come from the board's support for up to 8 GB of dual-channel Registered ECC DDR2 SDRAM and the next-generation PCI Express* I/O interconnect technology. The board also supports Intel® Power and Thermal Headroom, Intel's server technology to help protect performance over the long term and facilitate scalability so that systems can grow alongside the business itself.

To enhance availability and manageability, the Entry Server Board SE7230NH1-E supports the Intel® Server Management 8 software and utilities, and one board model also supports the breakthrough Intel® Active Management Technology³. What's more, the board can be deployed broadly thanks to its full compliance with the global RoHS Lead-Free Directive.

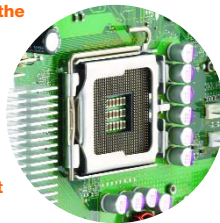
The Entry Server Board SE7230NH1-E is available as a standalone board in two models: SE7230NH1 and SE7230NH1LX. Board model SE7230NH1LX is also available in a partially integrated system with the optimized Intel® Server Chassis SR1475 as the Intel® Entry Server Platform SR1475NH1. In addition, board model SE7230NH1LX is compatible with the Intel® Entry Server Chassis SC5295-E.



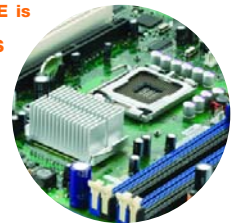
PCI Express* Offers Outstanding Data Throughput

In the Intel® Entry Server Board SE7230NH1-E, the PCI Express* x8 slot provides up to eight times the throughput of PCI-X 66MHz. Calculations are based on maximum theoretical throughput. Individual results may vary.

Through support for dual-core processors, the Intel® Entry Server Board SE7230NH1-E provides a powerful foundation for multitasking environments. A dual-core processor provides two complete execution cores instead of one, each with an independent interface to the frontside bus.

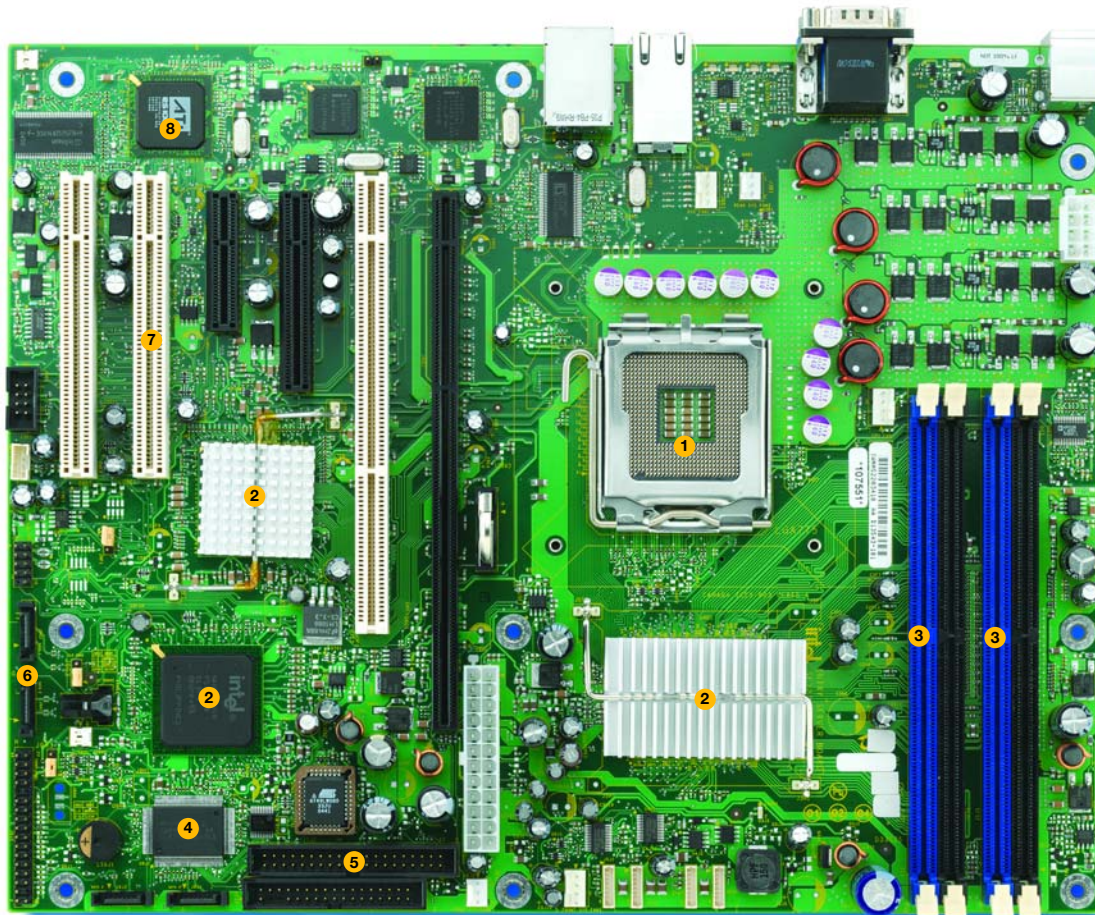


The Intel® Entry Server Board SE7230NH1-E is fully compliant with the European Union RoHS Lead-Free Directive. This means the board can be validated now for deployment into markets where RoHS compliance is required as early as mid-2006.



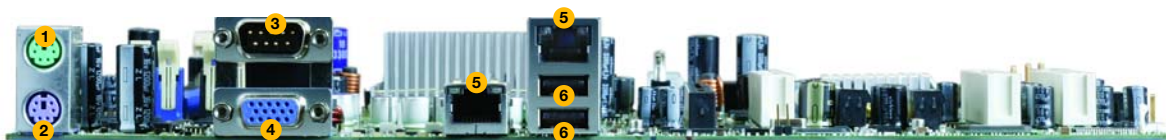
Intel® Entry Server Board SE7230NH1-E Features and Benefits

| Features | Benefits |
|--|---|
| Support for one Intel® Pentium® 4 processor, one dual-core Intel® Pentium® D processor, or one Intel® Pentium® 4 processor Extreme Edition with a system bus of up to 1066 MHz and Intel® EM64T ² | Performance and reliability for entry-level server applications |
| Intel® E7230 server chipset | Enterprise-class reliability and availability |
| Dual-channel memory with support for up to 8 GB of Registered ECC DDR2 400/533/667 SDRAM through four DIMM sockets | Highly reliable and powerful memory subsystem with automatic correction of single-bit errors, which may improve system uptime |
| One PCI Express* x8 connector; two PCI Express x4 connectors (each on a x1 lane) | Support for high-bandwidth adapter cards |
| Intel® Adaptive Slot technology (SE7230NH1LX only) supporting PCI Express, PCI-X, and PCI I/O interconnect technologies | Support for multiple I/O configurations, flexibility, and scalability |
| Dual Gigabit Ethernet connections | Ample network bandwidth with options for separate subnets and redundant links |
| Intel® Server Management 8 | OS agent-based monitoring and alerting of hardware, operating system, and application health |
| Support for Intel® Active Management Technology ³ | Basic out-of-band capabilities for monitoring hardware and software status regardless of OS or power state |



Intel® Entry Server Board SE7230NH1-E

- Support for one Intel® Pentium® 4 processor, one dual-core Intel® Pentium® D processor, or one Intel® Pentium® 4 processor Extreme Edition with an LGA775 socket and a system bus of up to 1066 MHz
- Intel® E7230 server chipset
- Support for up to 8 GB of Registered ECC DDR2 400/533/667 SDRAM
 - Dual memory channels for high-speed data transfer
- Support for optional Intel® Active Management Technology³
- Single-channel ATA 100 supporting up to two IDE devices
- Four independent SATA II ports at 3Gbps supporting RAID 0, 1, and 10
- Six independent buses supporting PCI Express*, PCI-X, and PCI
 - Board model SE7230NH1LX:*
 - One PCI Express x4 slot on a x1 lane
 - One Intel® Adaptive Slot⁴ (supports PCI Express x8, PCI-X, or PCI riser)
 - One PCI-X 64-bit/133MHz slot
 - Two PCI 32-bit/33MHz 3.3V conventional slots (do not support 5V-only adapters)
 - Board model SE7230NH1:*
 - One PCI Express x8 slot
 - One PCI Express x8 slot on a x4 lane
 - One PCI Express x4 slot on a x1 lane
 - Two PCI 32-bit/33MHz 3.3V conventional slots (do not support 5V-only adapters)
- ATI® ES1000 16MB SVGA graphics



Intel® Entry Server Board SE7230NH1-E – I/O Panel Features

- Mouse connector
- Keyboard connector
- DB9 serial-port A connector
- Video connector
- Dual Ethernet connectors
- Two USB 2.0 connectors

Intel® Entry Server Board SE7230NH1-E Boxed Contents

The Intel® Entry Server Board SE7230NH1-E comes with quick-start documentation, cables, and software designed to help streamline the system build.



1. One Intel® Entry Server Board SE7230NH1-E
2. Quick Start User Guide
3. Intel® Server Management 8 CD Pack containing:
 - Intel® Server Deployment Toolkit with Intel® Express Installer, Intel® Server Maintenance and Reference Training (SMaRT) Tool Software, server product information, technical documentation, customer support information, drivers and utilities, and Web links
 - CD-ROM with Intel® Server Manager 8 family of software
4. Cable kit
5. I/O shield
6. Board-configuration label

The Intel® Entry Server Board SE7230NH1-E is Part of a Family of Uniprocessor Server Boards Supporting Intel® Pentium® Processors with a System Bus of Up to 1066 MHz

| Product | Positioning | PCI Configuration | Integrated Storage | Integrated Networking | Memory Support | Management Solution |
|-------------|--|---|--|--|---|---|
| SE7221BK1-E | Performance board delivering performance, availability, and scalability | Four independent PCI buses with support for: 1U—One Intel® Adaptive Slot ⁴ for PCI Express [®] x8 or PCI-X 100MHz Pedestal—Four slots with PCI Express x8 and PCI-X 100MHz support | Quad-channel SATA with integrated RAID 0, 1, and 10 | Up to two Intel® PRO/1000 Server Network Connections | Four DIMMs supporting up to 4 GB of dual-channel ECC DDR2 400/533 SDRAM | Intel® Server Management 8 with onboard platform instrumentation |
| SE7230NH1-E | Performance board delivering I/O flexibility and manageability for entry-level applications | Six independent buses with support for: SE7230NH1LX —One PCI Express x4 slot on x1 lane One Intel® Adaptive Slot (supports PCI Express x8, PCI-X, or PCI riser) One PCI-X 64-bit/133MHz slot Two PCI 32-bit/33MHz 3.3V conventional slots SE7230NH1 —One PCI Express x8 slot on x4 lane One PCI Express x8 on x1 lane Two PCI 32-bit/33MHz 3.3V conventional slots | Quad-channel SATA II (3Gbps) with integrated RAID 0, 1, and 10 | Dual Gigabit Ethernet connections | Four DIMMs supporting up to 8 GB of dual-channel ECC DDR2 400/533/667 SDRAM | Intel Server Management 8 with OS agent-based instrumentation; Intel® Active Management Technology available on SE7230NH1LX |
| SE7221BA1-E | Value board delivering essential features for entry-level applications and server appliances | Three independent buses with support for one PCI Express x8 slot, two PCI Express x4 slots (each limited to x1 throughput), and three PCI 32-bit/33MHz slots | Quad-channel SATA with integrated RAID 0, 1, and 10 | One Gigabit Ethernet connection and one 10/100 Ethernet connection | Four DIMMs supporting up to 4 GB of dual-channel ECC DDR2 400/533 SDRAM | Intel Server Management 8 with OS agent-based instrumentation |

Visit <http://www.intel.com/go/serverbuilder> for information on additional server boards, chassis, and RAID adapters and for details on specific Intel® Server Board configurations.

Compatible Products for Comprehensive Solutions

The following table provides a list of key compatible products for the Intel® Entry Server Board SE7230NH1-E. Please visit <http://support.intel.com/support/motherboards/server/se7230nh1-e> for the most recent and comprehensive product compatibility list.

| Intel Building Block | Product Name(s) | Product Order Code(s) |
|----------------------------------|--|--------------------------|
| Intel® Server Board | Intel® Entry Server Board SE7230NH1-E Intel® Entry Server Board SE7230NH1-E LX <i>(supporting Intel® Adaptive Slot technology and Intel® Active Management Technology)</i> | SE7230NH1 SE7230NH1LX |
| Intel® Server Chassis (1U) | Intel® Server Chassis SR1475 <i>(combines with board model SE7230NH1LX to create Intel® Entry Server Platform SR1475NH1)</i> | SR1475 |
| Intel® Server Chassis (pedestal) | Intel® Entry Server Chassis SC5295-E | SC5295UP SC5295UPNA |
| Intel® Server Adapter | Intel® PRO/1000 MT Server Adapter | PWLA8490MT |

For a complete list of spares and accessories, see the Intel® Entry Server Board SE7230NH1-E Configuration Guide at <http://support.intel.com/support/motherboards/server/se7230nh1-e>.

The Intel® Entry Server Platform SR1475NH1 includes the Intel® Entry Server Board SE7230NH1LX partially integrated with the Intel® Server Chassis SR1475. This simplifies ordering and stocking and expedites the integration of a complete system.



Intel® Entry Server Board SE7230NH1-E Specifications

Processor/Cache Support

For the latest information on processor support, visit <http://support.intel.com/support/motherboards/server/se7320nh1-e>

One Intel® Pentium® 4 processor (LGA775 socket) or dual-core Intel® Pentium® D processor or Intel® Pentium® 4 processor Extreme Edition with 1 MB of integrated L2 cache and a system bus of up to 1066 MHz

System Memory

For the latest information on memory support, visit <http://support.intel.com/support/motherboards/server/se7320nh1-e>

| | |
|----------------------|---|
| Capacity | Four DIMM sockets serviced by dual memory channels for up to 8 GB of ECC DDR2 400/533/667 memory; memory can be implemented with either single-sided (one row) or double-sided (two rows) DIMMs |
| Type | Registered ECC or non-ECC DDR2 400/533/667 SDRAM 72-bit, 240-pin gold-plated DIMMs |
| Memory Voltage | 1.8V only |
| Reliability Features | Corrects single-bit errors, detects multiple-bit errors (using ECC memory) |

Integrated Onboard

| | |
|-----------------------------------|--|
| Chipset | Intel® E7230 chipset |
| Intel® Server Network Connections | Integrated Intel® 82573E Gigabit Ethernet controller supporting 1000BASE-T; integrated Intel® 8254PI Gigabit Ethernet controller supporting 1000BASE-T; two RJ45 connectors for CAT6 TP cable |
| Super I/O Controller | SMsC LP47M182NR (SE7230NH1) or National Semiconductor* PC8374LOIBU (SE7230NH1LX) |
| Integrated Hardware Monitoring | Integrated National Semiconductor LM96000 controller including remote alerts |
| Graphics | An internal Intel® MCH module that includes an integrated graphics engine supporting standard SVGA drivers with analog display capabilities; 16 MB of dedicated memory to support the on-board ATI® ES1000 graphics controller |

Integrated Storage Support

| | |
|--------------|--|
| Parallel ATA | Single-channel ATA 100 supporting up to two IDE devices |
| Serial ATA | Four SATA II (3 Gbps) connectors with RAID support in the BIOS; RAID 0, 1, and 10 supported for SATA disks |

Input/Output

| | |
|-------------------|--|
| PCI | Six independent PCI bus segments with an optional Intel® Adaptive Slot ¹ to provide adapter support for PCI Express* x8 and PCI-X, two independent PCI Express x4 connectors (each on a x1 lane), and three PCI 32-bit/33MHz connectors; the PCI Express x8 and x4 buses are directed through the MCH and the PCI 32-bit/33MHz bus is directed through the Intel® ICH7R |
| IDE | Single-channel IDE for a total of two legacy IDE devices |
| USB | Two external USB headers (back) and one internal USB header for two additional USB ports |
| Serial Ports | One asynchronous RS-232C serial port; one external 9-pin connector |
| Floppy Controller | 1.44 MB and 2.88 MB, 3-mode support |
| Keyboard/Mouse | Two external PS/2 ports, 8240A-compatible |

Management Technologies

| | |
|--|--|
| Intel® Server Management 8 | OS agent-based instrumentation and Intel Server Manager 8 family of software |
| Intel® Active Management Technology ² | Basic out-of-band management capabilities to simplify asset management and streamline system upgrade |

Validated Operating Systems

Microsoft® Windows® Server 2003 Enterprise Edition, Microsoft Windows XP, Red Hat® Linux® Enterprise 3.0 (EM64T³), Red Hat Desktop

System BIOS

| | |
|------------------|---|
| Type | 8Mb Flash EEPROM with AMI® BIOS, Multiboot BBS (BIOS Boot Specification) 1.4-compliant |
| Special Features | Flashable, setup utility available, Plug and Play, IDE drive autoconfigure, SMBIOS 2.3, ECC/Parity support, multilingual support, enabled for rolling/online BIOS updates |

Jumpers

CMOS clear, BIOS recovery

Front-Panel Support

Power LED, hard-drive activity LED, power/sleep switch, network connection LED, reset switch

Power Requirements

(typical configuration with PCI adapters)

| | |
|-------|--------------------------------|
| +5V | 13A maximum continuous current |
| +12V | 16A maximum continuous current |
| +3.3V | 10A maximum continuous current |

Mechanical

| | |
|-------------|------------------------------|
| Board Style | ATX |
| Board Size | 12" x 9.6" (305 mm x 244 mm) |

Lead-Free Compliance

Compliance with European Union Lead-Free Directive 2002/95/EC, officially titled "The Restriction on the Use of Hazardous Substances (RoHS) in Electrical and Electronic Equipment"

Environment

| | |
|---------------------|--|
| Ambient Temperature | Operating (system): 10°C to 35°C; non-operating/storage (system): -40°C to +70°C ambient |
| Relative Humidity | Non-operating: 95%, non-condensing at 30°C |

Safety and EMC Regulatory Compliance (Class A)

(EMC Regulatory Compliance is based on a board configured in an Intel host system in which Intel tested the board and found it compliant.)

| Country | Certification Safety and/or EMC | Regulatory Mark Safety and/or EMC |
|---------------------------|---------------------------------|-----------------------------------|
| Australia/ New Zealand | ACA, MED | C-Tick |
| Canada | UL / Industry Canada | cURus / ICES |
| Europe | European Directives | CE |
| International | CB Report / CISPR | Not applicable |
| Japan | VCCI (Verification only) | Not applicable |
| Korea | RRL | MIC |
| Taiwan | BSMI DOC | BSMI |
| United States | UL / FCC (Verification only) | cURus |

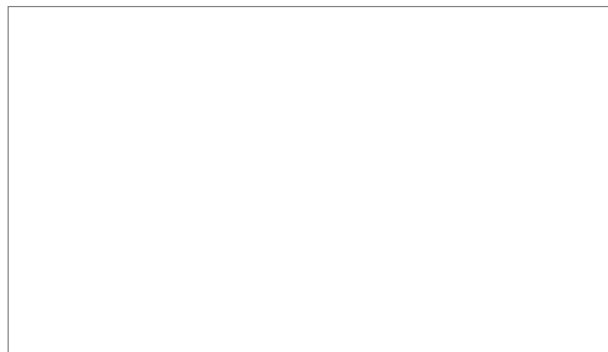
¹ Hyper-Threading Technology (HT Technology): Using HT Technology with this product requires a Pentium 4 processor that supports this feature and an HT Technology-enabled chipset, BIOS, and operating system. See <http://support.intel.com/support/motherboards/server/> for more information, including details on which processors and operating systems support this feature.

² Intel® Extended Memory 64 Technology (Intel® EM64T) requires a computer system with a processor, chipset, BIOS, OS, device drivers and applications enabled for Intel EM64T. **Processor will not operate (including 32-bit operation) without an Intel EM64T-enabled BIOS.** Performance will vary depending on your hardware and software configurations. **Intel EM64T-enabled OS, BIOS, device drivers and applications may not be available.** Check with your vendor for more information.

³ Intel® Active Management Technology and Intel® Adaptive Slot technology are available on board model SE7230NH1LX only.

⁴ Intel® Adaptive Slot technology is available on board model SE7221BK1LX only.

For more information on how to make the Intel® Entry Server Board SE7230NH1-E part of your server environment, please contact an Intel® Channel Membership Programs participant.



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