Product Brief

Intel® Entry Server Board SE7230NH1-E

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

Intel® Entry Server Board SE7230NH1-E

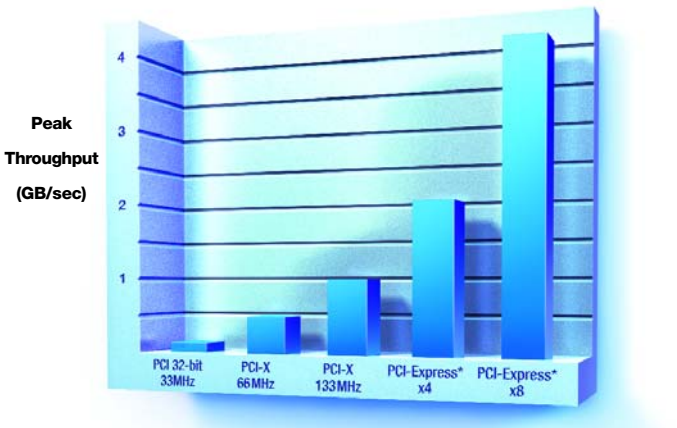
Essential server-class features for general-purpose entry-level server applications

By supporting single- and dual-core Intel® processors with a system bus of up to 1066 MHz, Hyper-Threading Technology[1], and Intel® EM64T[2], the Intel® Entry Server Board SE7230NH1-E enables 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 Unbuffered 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.



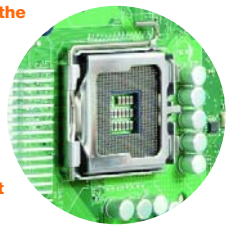
PCI Express* Offers Outstanding Data Throughput

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.*

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 Technology[3]. 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.

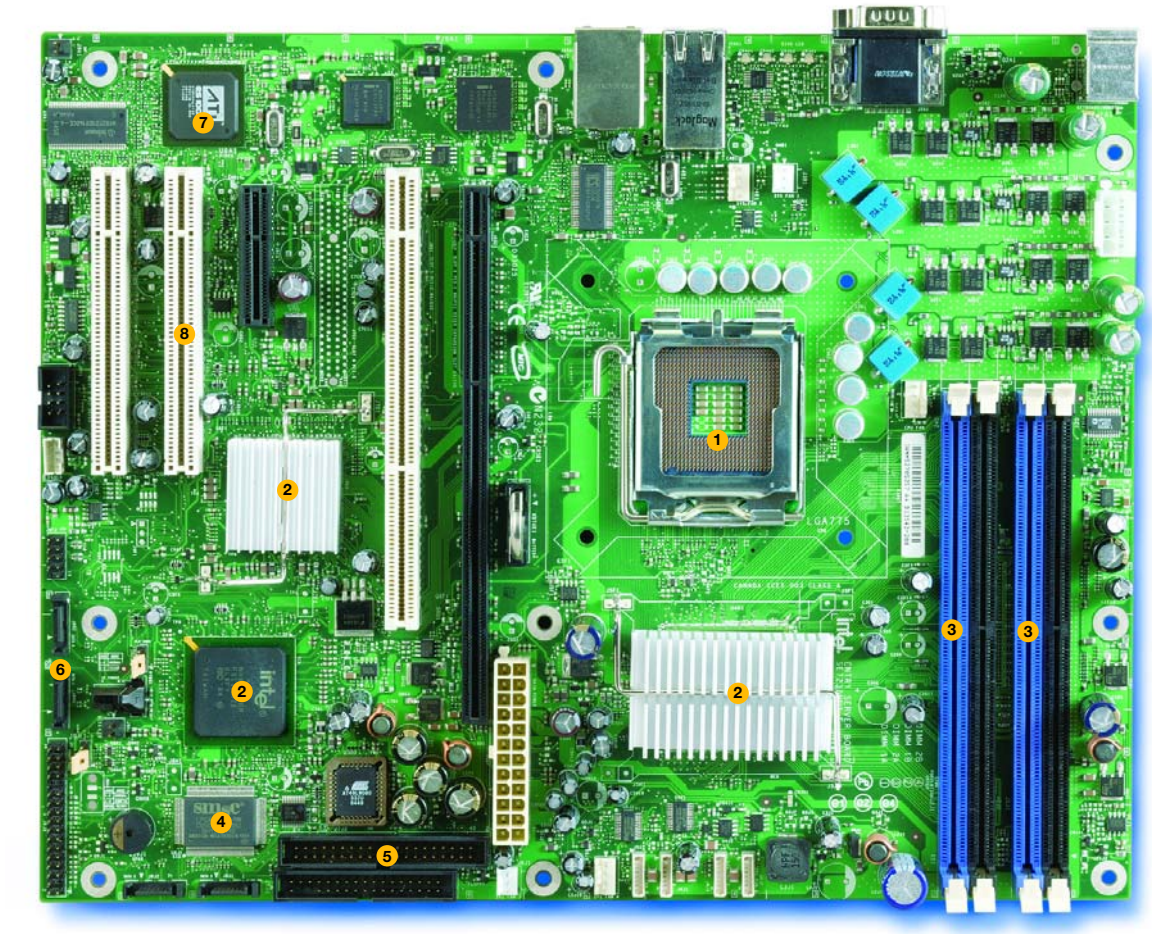
Through support for dual-core processors, the Intel® Entry Server Board SE7230NH1-E provides a powerful foundation for multitasking environments. A dual-core processor provides two complete execution cores instead of one, each with an independent interface to the frontside bus.



The Intel® Entry Server Board SE7230NH1-E is fully compliant with the European Union Directive on Removal of Hazardous Substances (RoHS). 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 Unbuffered 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

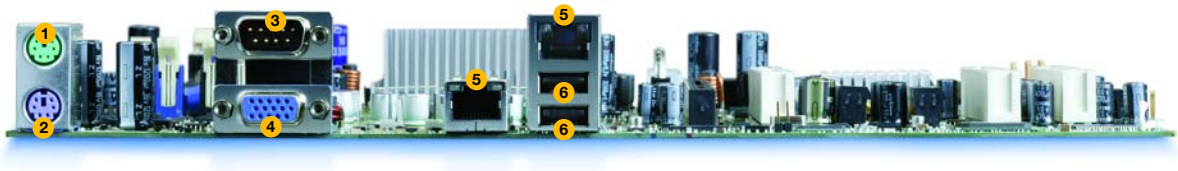


Intel® Entry Server Board SE7230NH1-E

1. 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
2. Intel® E7230 server chipset
3. Support for up to 8 GB of Unbuffered ECC DDR2 400/533/667 SDRAM
   - Dual memory channels for high-speed data transfer
4. Support for optional Intel® Active Management Technology[3]
5. Single-channel ATA 100 supporting up to two IDE devices
6. Four independent SATA II ports at 3Gbps supporting RAID 0, 1, and 10
7. ATI* ES1000 16MB SVGA graphics
8. 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 Slot[3] (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)



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

1. Mouse connector
2. Keyboard connector
3. DB9 serial-port connector
4. Video connector
5. Dual Ethernet connectors
6. 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, the Intel® Server Chassis SR1475, and the Intel® Entry Server Platform SR1475NH1. 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)	Attach Rate
Intel® Server Board	Intel® Entry Server Board SE7230NH1-E Intel® Entry Server Board SE7230NH1-E LX *(supporting Intel® Adaptive Slot Technology and Intel® Active Management Technology)*	**SE7230NH1** **SE7230NH1LX**	N/A
Intel® Server Chassis *(1U)*	Intel® Server Chassis SR1475 *(compatible with board model SE7230NH1LX)*	**SR1475** **SR1475NA**	10%
Intel® Server Chassis *(pedestal)*	Intel® Entry Server Chassis SC5295-E *(compatible with board model SE7230NH1 or SE7230NH1LX)*	**SC5295UP** **SC5295UPNA**	50%
Intel® Server Accessories	1U Hot-Swap SATA Backplane and Cables	**A1400SATAKIT**	40%
	1U Hot-Swap SCSI Backplane and Cables	**A1400SCSIKIT**	10%
	1U PCI-X Riser Card	**ABKPCIXUP**	45%
	1U PCI Express* x8 Riser Card	**ABKPCIEXPUP**	15%
	Rack Brackets	**AXXBRACKETS**	60%
	SR1400, SR1475, and SR2400 Tool-less Rail Kit	**AXXHERAIL**	40%
	1U Cable Management Arm *(Rail Kit required)*	**AXXRACKCARM**	20%
	Slimline CD	**AXXSCD**	60%
	Slimline DVD/CD	**AXXDVDCDR**	20%
	Slimline Floppy	**AXXFLOPPY**	15%

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	Unbuffered 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 server 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[3] 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 EIDE 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[3]	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 (EM64T[2]), 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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