Product Brief
Intel® 3210 Chipset
Embedded Computing

Intel® 3210 Chipset for Embedded Computing

Product Overview
The Intel® 3210 chipset includes Error Correcting Code (ECC) memory for embedded applications that need high reliability, such as robotics on a factory floor, multi-function printers and network security applications. This server-class chipset, with embedded lifecycle support, provides robust I/O performance and memory speed for fast system responsiveness required in mid-range network security appliance, print imaging, storage and I/O-intensive industrial applications.

The chipset consists of the Intel® 3210 Memory Controller Hub (MCH) and Intel® 82801IR I/O Controller Hub (Intel® ICH9R). It features a PCI Express® 2x8 or 1x16 I/O port, while an additional PCI Express port supports further expansion. The MCH supports dual-channel DDR2 MHz memory technology (up to 12.8 GB/s of peak memory bandwidth) and Error Correction Code memory for a high level of data integrity, reliability and system uptime.

Product Highlights
- 1333/1066/800 MHz front-side bus (FSB) for use with a variety of pin-compatible LGA 775 socket processors. These 45nm and 65nm processors meet a wide range of performance needs, providing reliability and scalability for embedded applications:
  - Intel® Core™2 Quad processor Q9400® (45nm) offers exceptional performance with four complete execution cores within a single processor.
  - Intel® Core™2 Duo processors E8400® and E7400® (45nm) offer dual-core, energy-efficient performance.
  - Intel® Pentium® processors E6500® and E5300® (45nm), and Intel® Celeron® processors E3400® (45nm) and E1500® (65nm) balance proven technology with exceptional value.
- 45nm processors support Enhanced Intel SpeedStep® technology, which decreases average power consumption and heat production by dynamically adjusting processor voltage and core frequency while maintaining application performance. These processors feature a front-side bus (FSB) speed of up to 1333 MHz and up to 6 MB cache for excellent performance-per-watt.
- Up to 12.8 GB/s memory speed (6.4 GB/s per channel with DDR2 800 MHz) and 8 GB memory addressability helps maximize system bandwidth and performance and eliminate slowdowns from memory bottlenecks.
- Intel® Virtualization Technology® for Directed I/O provides hardware assist to virtualization software, enabling platforms to support both 32- and 64-bit operating systems and applications on the same system.
- Intel® Matrix Storage Technology with integrated RAID 0, 1, 5, or 10 accelerates data access to support high user productivity and storage applications. Protects operations by allowing recovery of data in the event of a hard drive failure.
- PCI Express 2x8 or 1x16 I/O port enables faster I/O transactions to help peripherals keep up with high-performance platforms. Additional port supports further expansion possibilities.
- ECC memory supports a high level of data integrity, reliability and system uptime. Detects multiple-bit memory errors and locates/corrects single-bit errors to keep applications running smoothly and prevent stealth data corruption.
- Serial ATA supports a faster transfer rate of up to 6 GB/s for improved data access. Includes native command queuing for high-speed disk access. Support for external SATA enables the full SATA interface speed outside the chassis, up to 3 GB/s.
- Embedded lifecycle support protects system investment by enabling extended product availability for embedded customers.
- In cooperation with a strong ecosystem of hardware and software vendors, including members of the Intel® Embedded and Communications Alliance (intel.com/go/eca), Intel helps cost-effectively meet development challenges and speed time-to-market.
Software Overview

The following independent operating system and BIOS vendors provide support for these platforms:

<table>
<thead>
<tr>
<th>Operating System</th>
<th>Contact</th>
</tr>
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<tbody>
<tr>
<td>Microsoft Windows® XP</td>
<td>Intel provides drivers³</td>
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<tr>
<td>Microsoft Windows® XP Embedded</td>
<td>Intel provides drivers³</td>
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<tr>
<td>Microsoft Windows® WEPOS</td>
<td>Intel provides drivers³</td>
</tr>
<tr>
<td>Microsoft Windows® Server 2003</td>
<td>Intel provides drivers³</td>
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<tr>
<td>Red Hat Enterprise Linux® 5</td>
<td>Red Hat</td>
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<tr>
<td>Novell SUSE Linux® Enterprise 10</td>
<td>Novell</td>
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<tr>
<td>Wind River Linux®</td>
<td>Wind River</td>
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<tr>
<td>Wind River VxWorks® 6.6</td>
<td>Wind River</td>
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BIOS

American Megatrends
Insyde Software
Phoenix Technologies

For the most recent software updates please visit downloadcenter.intel.com, and enter the product name.

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<table>
<thead>
<tr>
<th>Product</th>
<th>Product Code</th>
<th>Package</th>
<th>Features</th>
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<tbody>
<tr>
<td>Intel® 3210 Memory Controller Hub (MCH)</td>
<td>NU3210MC</td>
<td>1300 Flip Chip Ball Grid Array (FC-BGA)</td>
<td>1333/1066/800 MHz system bus; DDR2 800/667 with ECC support; PCI Express® I/O interface with 1×16 or 2×8 support.</td>
</tr>
<tr>
<td>Intel® I/O Controller Hub 9R (Intel® ICH9R)</td>
<td>PW82801IR</td>
<td>31 mm 652-pin PBGA</td>
<td>Four PCI masters and six PCI Express x1 channels; four SATA ports; 12 Hi-Speed USB 2.0 ports; dual EHCI controllers; enhanced SPI interface; integrated 1D/100/1000 MAC; RAID 0, 1, 5 and 10; and Intel® Matrix Storage Technology.</td>
</tr>
<tr>
<td>Intel® 82566DC Gigabit Ethernet Controller (optional)</td>
<td>RU82566DC</td>
<td>10x10 mm 6702PXHV</td>
<td>Smaller footprint and lower power dissipation compared to multi-chip MAC and PHY solution; 10/100/1000 Mb/s data transfer; footprint compatible with Intel® 82562BV 10/100 Network Connection.</td>
</tr>
<tr>
<td>Intel® 6702PXH 64-bit PCI Hub (optional)</td>
<td>QGE6702PXHV</td>
<td>567-pin Flip Chip Ball Grid Array (FC-BGA)</td>
<td>Compatible with PCI Express x1a compliant with PCI spec rev 2.3 and PCI Standard Hot-plug Controller spec rev 1.0, electrically compliant with System Management Bus 2.0 spec with PEC support.</td>
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Intel in Embedded and Communications: intel.com/embedded

³Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See http://www.intel.com/products/processor_number for details.

²See the Processor Spec Finder at http://processors-spec.intel.com or contact your Intel representative for more information.

¹Intel Virtualization Technology requires a computer system with an enabled Intel® processor, BIOS, virtual machine monitor (VMM), and, for some uses, certain platform software enabled for it. Functionality, performance or other benefits will vary depending on hardware and software configurations and may require a BIOS update. Software applications may not be compatible with all operating systems. Please check with your application vendor.

¹Drivers available at: downloadcenter.intel.com (enter chipset name).

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