

## Product Brief

### Intel® E7520 Chipset

Embedded Computing

# Intel® E7520 Chipset

## for Intel® Core™2 Duo Processors and Intel® Core™ Duo Processors

### Product Overview

The Intel® E7520 chipset for embedded computing – utilizing dual-processor, high-bandwidth chipset technology – enables reduced power consumption with improved platform reliability and system manageability compared to previous-generation Intel® chipsets. The 667 MHz front-side bus supports Intel® Core™2 Duo processors (T7400<sup>1</sup>, L7400<sup>1</sup>) and Intel® Core™ Duo processors (T2500<sup>2</sup>, L2400<sup>2</sup>), providing high bandwidth for increased memory and I/O throughput, specifically optimized to offer a value-sensitive solution for embedded and communications applications.

Intel Core 2 Duo processors are based on Intel® Core™ microarchitecture with support for Intel® 64 architecture<sup>5</sup> (Intel® 64) and 36 bits of physical addressing, delivering breakthrough, energy-efficient performance to help equipment manufacturers optimally balance processing capabilities within power and space constraints. Intel Core Duo processors are derived from the Intel® Pentium® M processor with significant hardware architecture enhancements in stack management, instruction execution, and branch prediction. These processors, when paired with the Intel E7520 chipset, provide an ideal solution for a wide range of performance-intensive, low-power communication and embedded applications in smaller form factor designs. While incorporating advanced processor technology, these processors remain software-compatible with previous IA-32 processors.

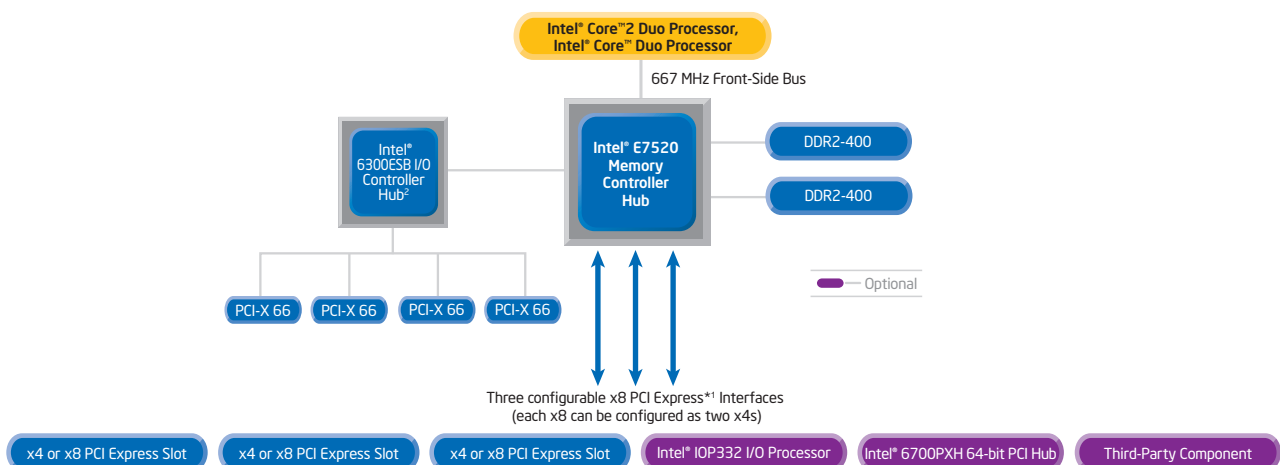
The Intel® E7520 Memory Controller Hub (MCH) includes PCI Express\*<sup>1</sup> serial I/O technology and DDR2 memory technology to help increase I/O bandwidth and reduce system latency for data-intensive applications. It is the central hub for all data passing among the core system elements, including processors, memory, PCI Express I/O, and legacy I/O subsystems.

### Memory

This platform can be designed to support single- or dual-channel DDR2-400 memory (up to 4 GB). DDR2-400 memory technology is ideal for storage and memory-intensive applications, providing up to 20% increase in memory bandwidth and up to 40% decrease in power consumption over DDR 333. The memory subsystem interface to the MCH is dual channel, supporting up to four registered DIMMs per channel – depending on memory technology – for a total system bandwidth of up to 6.4 GB/s.

### PCI Express

For demanding I/O and networking applications, PCI Express interfaces attach a variety of Intel and third-party I/O solution components and adapters directly to the Intel E7520 MCH at throughput speeds of up to 4 GB/s on each x8 interface, allowing I/O to keep pace with the rest of the platform. The MCH has three x8 PCI Express interfaces which can each be bifurcated into two x4 interfaces for additional configuration flexibility.



**Figure 1: Intel® E7520 Chipset with Intel® Core™2 Duo and Intel® Core™ Duo Processors**

<sup>1</sup> PCI Express reduced-power state L0s not supported.

<sup>2</sup> Intel® 6300ESB ICH supports up to 4 PCI-X down devices.

**Intel® 6300ESB I/O Controller Hub**

Available as the I/O controller hub for legacy I/O support, the Intel® 6300ESB I/O Controller Hub (ICH) attaches directly to the MCH through the Intel® Hub Interface 1.5 connection. For the most demanding storage data transfers, it integrates dual independent SATA controllers, each capable of up to 150 MB/s transfer rate. Four Hi-Speed USB 2.0 ports allow easy I/O connection while offering improved bandwidth compared to USB 1.1 devices. The Intel 6300ESB ICH includes a PCI-X 64/66 bus supporting up to four PCI-X 64/66 MHz masters.

**Intel® 6700PXH 64-bit PCI Hub (Optional)**

The Intel® 6700PXH 64-bit PCI Hub connects to the MCH through a point-to-point x8 or x4 PCI-X Express interface. Each hub contains two bus segments that can be independently configured to operate in PCI (33 or 66 MHz) or 64-bit PCI-X mode (66, 100, or 133 MHz), for either 32-bit or 64-bit PCI/PCI-X devices. In addition, each hub integrates two PCI standard hot plug controllers – one per PCI/PCI-X interface – and can be independently configured up to two PCI-X 64/133 MHz segments.

**Features****Benefits**

Supports Intel® Core™2 Duo Processors with 667 MHz front-side bus and 4 MB L2 Cache, and Intel® Core™ Duo Processors with 667 MHz front-side bus and 2 MB L2 cache	<ul style="list-style-type: none"> <li>Dual-core processor is optimized for multithreaded applications and multitasking, meeting the need for high-performance, low-power applications with small form-factor constraints</li> </ul>
PCI Express*	<ul style="list-style-type: none"> <li>Direct connection between the MCH and PCI Express component/adapters; bandwidth up to 4 GB/s on each x8 PCI Express interface; higher bandwidth and less I/O bottlenecks than PCI-X</li> </ul>
DDR2-400 memory interface	<ul style="list-style-type: none"> <li>Maximum memory bandwidth of 6.4 GB/s</li> <li>Decreased power consumption – especially important on dense rack, hot-plug controller and blade configurations</li> </ul>
Intel® 6700PXH 64-bit PCI Hub (Optional)	<ul style="list-style-type: none"> <li>Supports two independent 64-bit, 133 MHz PCI-X segments and two hot-plug controllers (one per segment)</li> <li>Enhancements to PCI/PCI-X performance and platform flexibility</li> </ul>
Intel® Hub Interface 1.5 connection	<ul style="list-style-type: none"> <li>Point-to-point connection between the MCH and the Intel® 6300ESB I/O Controller Hub provides 266 MB/s of bandwidth</li> </ul>
Advanced Platform RAS	<ul style="list-style-type: none"> <li>Features such as memory ECC, Intel® x4 Single Device Data Correction<sup>3</sup> (x4 SDDC), DIMM sparring, DIMM scrubbing and memory mirroring can improve system reliability</li> <li>32-bit cyclic redundancy check on PCI Express</li> <li>Hot swap PCI Express enhances serviceability</li> <li>SMBus port hooks into Intel® E7520 MCH for remote management operation and support for a variety of third-party base management controller and BIOS solutions</li> </ul>

**Product****Product Code****Package**

Intel® E7520 Memory Controller Hub (MCH)	NQE7520MC	1077 Flip Chip-Ball Grid Array (FC-BGA)
Intel® 6300ESB I/O Controller Hub	FW6300ESB	689 Plastic Ball Grid Array (PBGA)
Intel® 6700PXH 64-bit PCI Hub (optional)	RG82870P2	567 Flip Chip-Ball Grid Array (FC-BGA)

\*Intel 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](http://www.intel.com/products/processor_number) for details.

<sup>3</sup>64-bit computing on Intel® architecture requires a computer system with a processor, chipset, BIOS, operating system, device drivers and applications enabled for Intel® 64 architecture. Processors will not operate (including 32-bit operation) without an Intel® 64-enabled BIOS. Performance will vary depending on hardware and software configurations. Consult with your system vendor for more information.

<sup>3</sup>In an x4 DDR memory device, the Intel x4 Single Device Data Correction (x4 SDDC), provides error detection and correction for one to four data bits within a single device, and provides error detection for up to eight data bits within two devices.

**Intel Access**

<b>Embedded Intel® Architecture Home Page:</b>	<a href="http://intel.com/design/intarch">intel.com/design/intarch</a>
<b>Developer's Site:</b>	<a href="http://developer.intel.com">developer.intel.com</a>
<b>Intel in Communications:</b>	<a href="http://intel.com/communications">intel.com/communications</a>
<b>General Information Hotline:</b>	(800) 628-8686 or (916) 356-3104 5 a.m. to 5 p.m. PST
<b>Intel® Literature Center:</b>	(800) 548-4725 7 a.m. to 7 p.m. CST (U.S. and Canada) International locations please contact your local sales office.

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