



Intel® Pentium® 4 Processor for Embedded Computing

Product Overview

Intel® Pentium® 4 processor-based platforms are designed as the gateway to a new generation of advanced, highly differentiated and scalable embedded solutions including communications, interactive client and industrial automation applications. An advanced microarchitecture and clock speeds of 2.0 GHz, 2.4 GHz, 2.6 GHz, and 2.8 GHz enable developers to meet embedded computing demands, today and in the future. While incorporating new features and improvements, the Intel Pentium 4 processor remains software-compatible with previous members of the Intel® microprocessor family.

The Intel Pentium 4 processor is validated with the Intel® 845 chipset, the Intel® 845E chipset, the Intel® 845GV chipset, the Intel® 852GME chipset, and the Intel® 875P chipset to create platforms with excellent price and performance for embedded computing segments. This chipset family provides up to 2 GB channel DDR memory—DDR 200, DDR 266 and DDR 333 (845GV)—and features configurable optional Error Correcting Code (ECC) operation (845 and 845E). Additionally, the Intel 852GME chipset supports the Intel Pentium 4 processor with a low-power design and up to 2 GB of DDR 266/333 system memory. It provides an optimized integrated graphics solution with a 400 MHz and 533 MHz system bus, and supports Intel® Extreme Graphics 2 Technology. The Intel 875P chipset supports DDR 266/333/400 SDRAM with ECC, ACP-8X, Communications Streaming Architecture (CSA), plus four PCI-X slots are provided for outstanding performance.



The scalable Intel Pentium 4 processor-based platform can help reduce the total cost of ownership for a new generation of advanced, highly differentiated embedded products by providing performance headroom, robust I/O, scalability and quality. Rapid platform development is supported by the latest operating systems, applications and Intel® Architecture development tools. Intel offers validated Pentium 4 processor-based reference designs to rapidly meet unique product application requirements (http://developer.intel.com/platforms/applied/eiacomm/reference_configs.htm). Board solutions are also available from third-party providers (<http://developer.intel.com/platforms/applied/eiacomm/buy-make.htm>).

Product Highlights

- Available at:
 - 2.0 GHz and 2.6 GHz with a 400 MHz processor system bus delivering 3.2 GB of data per second
 - 2.4 and 2.8 GHz with a 533 MHz processor system bus delivering 4.3 GB of data per second into and out of the processor

Intel in
Communications

Embedded Intel®
Architecture



run
Better, faster
and further.

Product Highlights (continued)

- Features Intel NetBurst® microarchitecture, providing software and architectural scalability for future performance processors:
 - Hyper-pipelined technology doubles the pipeline depth currently available on Intel® Pentium® III processors
 - Level 1 Execution Trace Cache includes 8 KB data cache, as well as an Execution Trace Cache that stores up to 12K decoded micro-ops in the order of program execution
 - Rapid Execution Engine includes two Arithmetic Logic Units (ALUs), clocked at twice the core processor frequency
 - 512 KB Level 2 Advanced Transfer Cache (ATC) delivers a high data throughput channel between the Level 2 cache and the processor core. Features of the ATC include:
 - Non-blocking, full-speed, on-die Level 2 cache
 - 8-way set associativity
 - 256-bit data bus to the Level 2 cache
 - Data clocked into and out of the cache every clock cycle
 - Deep, out-of-order speculative Advanced Dynamic Execution engine
 - Enhanced floating-point and multi-media unit expands floating-point registers to a full 128-bit and adds an additional register for data movement
- Internet Streaming SIMD Extensions 2 (SSE2) adds 144 new instructions that include 128-bit SIMD integer arithmetic and 128-bit SIMD double-precision floating-point operations
- Data Prefetch Logic functionality anticipates the data needed by an application and pre-loads it into the ATC, further increasing processor and application performance
- Validated with the Intel 845 chipset, Intel 845E chipset, Intel 845GV chipset, Intel 852GME chipset, and Intel 875P chipset
- Manufactured on 0.13µ process technology
- Memory cacheability up to 4 GB of addressable memory space; system memory scalability up to 64 GB of physical memory
- Support for uni-processor designs
- Data integrity and reliability features such as ECC, fault analysis and recovery for both system and Level 2 cache buses
- Fully compatible with existing Intel Architecture-based software
- FC-PGA2 478 package
- Embedded lifecycle support
- Intel Extreme Graphics 2 Technology with 845GV chipset and 852GME chipset

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Product Number	Core Speed	External Bus Speed	L2 Cache	Thermal Design Power	Voltage*	Tcase	Package
RK80532PE072512	2.8 GHz	533 MHz	512 KB	68.4 W	1.525 V	5-72° C	FC-PGA2 478
RK80532PC064512	2.6 GHz	400 MHz	512 KB	62.6 W	1.525 V	5-72° C	FC-PGA2 478
RK80532PE056512	2.4 GHz	533 MHz	512 KB	59.8 W	1.525 V	5-71° C	FC-PGA2 478
RK80532PC041512	2.0 GHz	400 MHz	512 KB	54.3 W	1.525 V	5-69° C	FC-PGA2 478

*Variable VID maximum voltage. The Intel® Pentium® 4 processor ships with different voltage settings. For more detailed product specifications, please refer to our Web site at <http://developer.intel.com/design/pentium4/datashts/298643.htm>

Intel Access

Developer's Site:	developer.intel.com
Embedded Intel® Architecture Home Page:	www.intel.com/design/intarch
Intel Technical Documentation Center:	www.intel.com/go/techdoc (800) 548-4725 7 a.m. to 7 p.m. CST (U.S. and Canada) International locations please contact your local sales office.
General Information Hotline:	(800) 628-8686 or (916) 356-3104 5 a.m. to 5 p.m. PST

For more information, visit the Intel Web site at: **developer.intel.com**

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