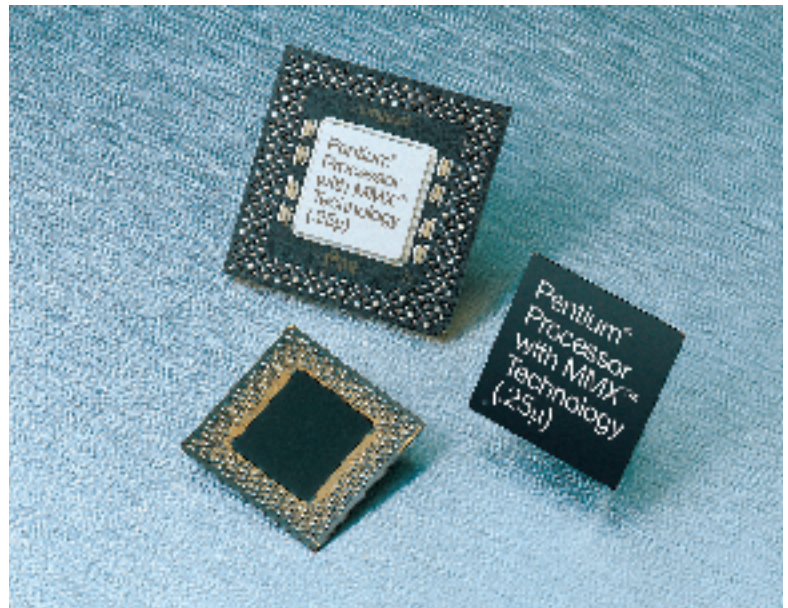# Low-Power Pentium® Processors with MMX™ Technology for Embedded Applications

PRODUCT OVERVIEW

The low-power Pentium® processors with MMX™ technology offer many advantages for embedded designers including high-performance and low power. Originally developed for use in mobile applications, the low-power Pentium processor with MMX technology family is available at 166 MHz and 266 MHz in both a Socket 7 (296-pin PPGA) and a new surface mountable 352-ball HL-PBGA (high thermal, low-profile, plastic ball grid array) package.

LOW-POWER CONSUMPTION

The low-power Pentium processors with MMX technology offer the lowest power consumption within the Pentium processor family. Based on Intel's 0.25 micron manufacturing process, the maximum thermal design power specification has been cut in half compared to Intel's specification for the mobile Pentium processors with MMX technology on the 0.35 micron process (4.5W vs 9.0W at 166 MHz). While actual power consumption will vary by application, these lower-power ratings should translate into simplified, lower cost thermal management solutions for embedded system designs. With core voltages of only 1.8V and I/O voltages of 2.5V, the maximum power dissipation at 166 MHz is merely 4.1W.

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The low-power Pentium processor with MMX technology is available in two packaging options: a 296-lead PPGA (Socket7), and a small surface mount 352-ball HL-PBGA (high thermal, low-profile, plastic ball grid array). The HL-PBGA package for the Pentium processor has been developed by Intel specifically for embedded applications. The HL-PBGA package not only has a small footprint, 35x35mm, but is also extremely thin at only 1.45mm high. In addition, the superior thermal properties of the package combined with the low-power dissipation of the processor allow the low-power Pentium processors with MMX technology in the HL-PBGA package to be specified to operate with a 0-95° C case temperature – a 25 degree improvement when comparing to the Intel specification for the previous generation Pentium processors with MMX technology. The temperature specification of the PPGA package is 0-85° C.

Speed	Package	V_{core}	$V_{I/O}$	Active Power (Typical)	Active Power (Maximum)	T_{case}
166 MHz	PPGA	1.9V	2.5V	2.9W	4.5W	0-85° C
166 MHz	HL-PBGA	1.8V	2.5V	2.3W	4.1W	0-95° C
266 MHz	PPGA	1.9V	2.5V	4.5W	7.6W	0-85° C
266 MHz	HL-PBGA	2.0V	2.5V	4.5W	7.6W	0-95° C

INTEL 82430TX PCISET

The low-power Pentium processor with MMX technology is supported by the Intel 430TX chip set which is also on Intel's embedded roadmap. The 430TX chip set is a high integration, 2-chip BGA solution that closes the power consumption gap and enables new applications by delivering mobile-style power management and the highest performance.

Intel's manufacturing capability helps ensure that the 82430TX PCIset will meet customers' quality and availability requirements.

Features	Benefits
■ **Optimized for Pentium processor with MMX technology**	Maximize performance of media rich applications
■ **Dynamic power management architecture**	Enhanced power savings with user control and flexibility with support for ACPI (Advanced Configuration and Power Interface)
■ **SDRAM support**	Highest memory bandwidth, reduced memory access times and ability to mix and match with EDO memory
■ **USB support**	Plug and Play peripheral connectivity supporting the latest generation of digital I/O
■ **Concurrent PCI**	Optimized performance through improved CPU utilization. Also enables adding new PCI card features without system degradation
■ **UltraDMA hard drive protocol**	Greater I/O throughput allows faster downloads

Intel Reference Numbers

World Wide Web Address:	http://developer.intel.com/
Intel Literature Center:	1 (800) 548-4725 7 a.m. to 7 p.m. CST
Retail PC and Network Products:	1 (800) 538-3373 or (503) 629-7000 7 a.m. to 7 p.m. PST
General Information Hotline:	1 (800) 628-8686 & (916) 356-3104 5 a.m. to 5 p.m. PST