efficēon PROCESSOR

Transmeta CORPORATION

Product Sheet

Transmeta™ Efficeon™ TM8300 Processor

The Transmeta Efficeon TM8300 processor is designed to address the ever-growing demand for x86 processing in value driven and energy conscious systems. Based upon a highly energy efficient design, the Efficeon TM8300 processor supports Transmeta's LongRun power and thermal management technology and fully integrated Northbridge functionality. The I/O interfaces built into the Efficeon processor's integrated Northbridge are matched with its high performance core, featuring support for DDR-400 memory, a 1.6 GB/s HyperTransport™ interconnect, and an AGP 4X graphics interface.

With the new Code Morphing Software for the Efficeon processor, Transmeta extends its leadership in power management, offering a solution that provides high performance while consuming less power for the same work. To maximize performance and responsiveness, the Efficeon TM8300 processor is based upon the same architecture and feature of the Efficeon TM8600 processor. Featuring a 256-bit wide VLIW engine that can execute up to 8 instructions per clock cycle, a 512KB L2 cache, and support for SSE & SSE2 instructions, the Efficeon TM8300 processor provides for a rich and compelling multimedia experience.

The result is a highly efficient x86 solution suitable for advanced web tablets, point of sale terminals (POS), high-end thin clients, notebooks and many other applications where an integrated, low power x86 processor is desirable.

HIGHLY INTEGRATED ARCHITECTURE

Fully Integrated Northbridge Core Logic

- On-chip DDR-400 memory interface
- Integrated AGP 2.0 compliant graphics interface for industry standard, high performance graphics solutions at 1X, 2X & 4X data rates
- On-chip 400 MHz HyperTransport™ interface, 8-bits wide in each direction, provides 12x the I/O throughput compared to 32-bit, 33 MHz PCI.
- Full support for ECC in L2 cache and northbridge memory controller enables expansion into the server market.

Enables Small Form Factor Designs

- Northbridge integration reduces system chip count, power consumption and PCB size

ENERGY EFFICIENT DESIGN

Enhanced LongRun™ Dynamic Power Management

- Enables longer battery life by dynamically adjusting operating frequency and voltage to match the performance requirements of application workloads
- Provides higher performance within smaller, thermally constrained environments

Enhanced LongRun Thermal Management

- Maximizes performance within a thermal envelope
- Low thermal characteristics enable fanless designs for quieter and more reliable systems

HIGH PERFORMANCE

8 Instruction Issue, 256-Bit VLIW Engine

- Fully Pentium 4-ISA compatible
- Up to eight instructions issued per clock cycle
- Up to 50% improvement in integer applications
- SSE and SSE2 multimedia extensions enables multimedia applications to run up to 80% faster per clock cycle than previous generation processors from Transmeta
- 512KB L2 cache improves processor performance

Advanced Code Morphing Software

- Improves performance and responsiveness over 1st generation Transmeta Crusoe technology
- Unique software based architecture is key to reducing power consumption and enabling future scalability and flexibility
- New generation Code Morphing Software technology leverages 256-bit VLIW hardware advances
- Enables quick, low cost improvements to performance and power

Transmeta Efficeon Processor Core

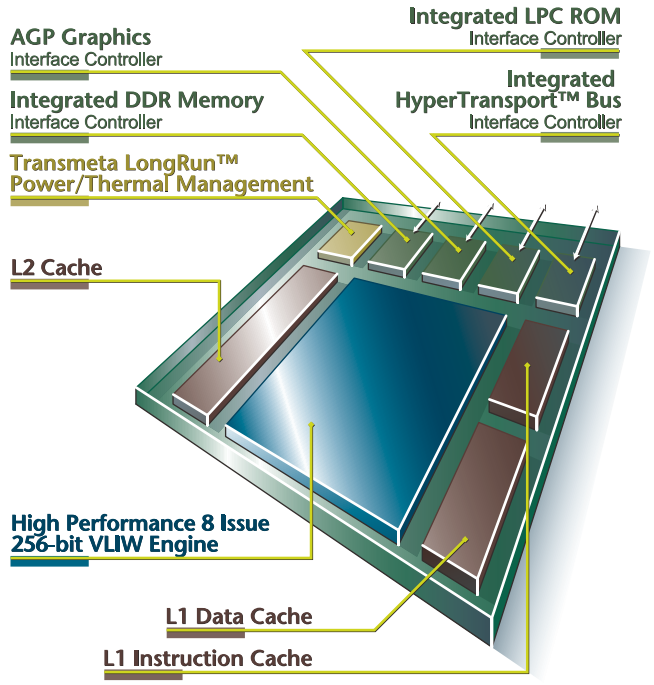
At the heart of the Transmeta Efficeon processor is a state-of-the-art VLIW (Very Long Instruction Word) hardware engine that uses a custom, efficient VLIW instruction set. Running on the processor is Transmeta's proprietary Code Morphing Software (CMS), the Efficeon software component that dynamically optimizes and translates x86 instructions into VLIW native code. This unique combination of hardware and software allows the processor to be more efficient, and also adds intelligence to Efficeon not found in other x86 microprocessors to manage power consumption and heat.

Transmeta Enhanced LongRun Power Management

Unlike conventional x86 processors, Transmeta's proprietary Enhanced LongRun power management technology is part of the Efficeon processor's Code Morphing Software. This combination allows the Efficeon processor to seamlessly adjust its operating frequency and voltage up to hundreds of times per second — dramatically extending battery life, limiting heat dissipation yet providing rapid system responsiveness.

Transmeta™ Efficeon™ Processor

Block Diagram



Smallest Solution Footprint

	Component	Package
CPU Northbridge	Efficeon (included)	841mm²
	Total	841mm²
CPU Northbridge	Pentium-M 855PM	1232mm² 1406mm²
	Total	2638mm²

Efficeon is less than 1/3 the size of Pentium-M and 855PM

Source: *http://www.intel.com — Intele Pentiumm M Processor Datasheet, June 2003; Intele 855PM Chipset Memory Controller Hub (MCH) DDR 200/266 MHz Datasheet, March 2003*

Quarter used to show relative size.

Transmeta Efficeon TM8300 Processor

Specifications	
On-die L1 Instruction Cache	128KB
On-die L1 Data Cache	64KB
On-die L2 Write-Back Cache	512KB
HyperTransport System Bus Speed	800 Megatransfers/s
Aggregate HyperTransport Link Bandwidth	1.6 GB/s
MMX, SSE, SSE2 Instruction Support	Yes
Fully Integrated Northbridge Functionality	Yes
Integrated AGP 1X, 2X, and 4X graphics interface	Yes
Support for DDR-266, 333, 400 memory	Yes
Support for ECC memory	Yes
Integrated Low Pin Count Bus (LPC)	Yes
Full x86 Software and OS Compatibility	Yes
Enhanced LongRun Thermal Management	Yes
Enhanced LongRun Power Management	Yes
Package Size	29mm x 29mm

For more information, visit **www.transmeta.com**

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