Crusoe™ PROCESSOR

Transmeta CORPORATION

Product Sheet

Transmeta™ Crusoe™ TM5700/TM5900 Processors

New Energy Efficient Designs with a Small Form Factor Package

Product Overview

Transmeta, the leader in efficient computing introduces the next generation of the Crusoe family of microprocessors. The new Transmeta Crusoe TM5700 and TM5900 processors are available in compact 21mm x 21mm package — a form factor that is 54% smaller than previous Crusoe processors. This makes them ideal for ultra-compact mobile and embedded designs.

The small footprint of Transmeta Crusoe TM5700/TM5900 processors have an optimized pin-out designed to enable 4-layer PCB designs to reduce overall costs for producing high-volume implementations. The smaller package size also makes them ideal for applications that require high performance processing within small and thermally constrained environments including ultra-personal computers (UPCs), thin clients, notebooks, web tablets, industrial control, general embedded, point-of-sale, portable consumer devices, set top boxes and many other applications.

Crusoe TM5700/TM5900
21mm x 21mm

US Quarter
24mm

Quarter used to show relative size

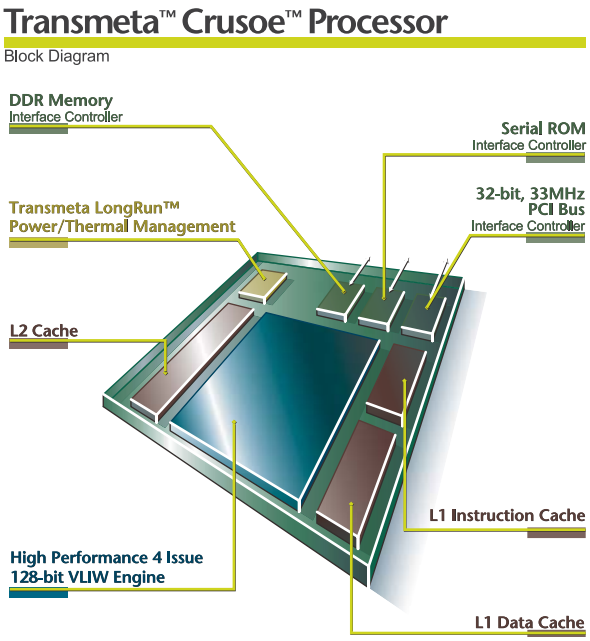
The Transmeta Crusoe processor is based upon a custom efficient instruction set that offers a number of compelling advantages, the most important of which is a reduction in the number of power hungry logic transistors used inside the processor core. This streamlined processor design allows the Crusoe processor to benefit from a greater performance-to-power ratio while keeping heat dissipation to a minimum.

Transmeta Crusoe Processor

Specifications	Crusoe TM5900 Processor	Crusoe TM5700 Processor
Frequency	800MHz - 1GHz	667MHz - 800MHz
On-die L1 Instruction Cache	64 KB	64 KB
On-die L1 Data Cache	64 KB	64 KB
On-die L2 Write-Back Cache	512 KB	256 KB
Integrated Northbridge Functionality	Yes	Yes
Integrated DDR Memory Controller	Supports DDR-266 SDRAM memory	Supports DDR-266 SDRAM memory
Integrated PCI Interface	32-bit, 33MHz PCI	32-bit, 33MHz PCI
Full x86 Software and OS Compatibility	Yes	Yes
LongRun Power Management	Yes	Yes
LongRun Thermal Management	Yes	Yes
Package Type	Compact 399-contact FC-OBGA package	Compact 399-contact FC-OBGA package
Package Size	21mm x 21mm	21mm x 21mm
Manufacturing Process	0.13µm	0.13µm
Max. Thermal Design Power	As low as 6.5W - 9.5W (includes integrated northbridge)	As low as 5.1W (includes integrated northbridge)
Availability	Now	Now

Transmeta Crusoe Architecture

Crusoe TM5700/TM5900 processors incorporate integer and floating-point execution units, separate instruction and data caches, a level 2 write-back cache, memory management unit, and multimedia instructions. In addition to these traditional processor features, the devices integrate Northbridge functionality, including a DDR SDRAM controller, PCI bus controller and serial ROM interface controller.



Integrated Northbridge Controller

Power consumption and thermal dissipation within the sytem has been reduced by integrating Northbridge controller functionality directly onto the processor core. This functionality — consisting of a DDR DRAM memory controller, a serial ROM interface, and a PCI bus controller — simplifies system design, reduces board space, enhances performance, and reduces costs. As a separate chip, a Northbridge chipset consumes 2-3 watts of additional power. In comparison, Transmeta's northbridge power is included in the Crusoe processor's low thermal design power.

128-Bit VLIW Processor Core

The Crusoe TM5700/TM5900 processor core architecture is relatively streamlined compared to conventional x86 processors. It is based on a very long instruction word (VLIW) 128-bit instruction set that can issue up to 4 instructions per clock cycle. Within this VLIW architecture, the control logic of the processor is reduced and software is used to control the scheduling of instructions. This allows for a very straightforward hardware implementation with an in-order 7-stage integer pipeline and a 10-stage floating-point pipeline. By streamlining the processor hardware and reducing the control logic transistor count, the performance-to-power consumption ratio (energy efficiency) can be greatly improved over conventional x86 architectures.

Code Morphing™ Software (CMS)

CMS — the software component of the Transmeta Crusoe processor — translates x86 instructions into highly optimized and extremely fast VLIW native instructions which are then processed with great efficiency. To optimize performance, frequently used translations are cached for subsequent reuse, further enhancing performance over standard x86 architectures.

Transmeta LongRun™ Power & Thermal Management

Transmeta LongRun power management technology further reduces thermal constraints by dynamically adjusting the operating voltage and clock frequency of the processor core based on application demands and intelligently adapts processor operation to system thermal environments. By evaluating the demand on the processor, LongRun delivers enough performance to satisfy the workload at hand. This conserves power and improves battery life. If desired, LongRun can be configured to deliver different performance characteristics depending on the application. Best of all, Transmeta LongRun technology provides more responsiveness than conventional power management schemes used by operating systems and is completely transparent to the end-user.

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

Crusoe™ PROCESSOR

Transmeta CORPORATION

UNITED STATES

Transmeta Corporation
World Headquarters
3990 Freedom Circle
Santa Clara, CA 95054
USA
Tel: (408) 919-3000
sales@transmeta.com

JAPAN

Transmeta Japan
KDDI Bldg Annex 3F
S2-3-3 Nishi-Shinjuku
Shinjuku-ku Tokyo 160-0023
Japan
Tel: +81-3-5325-9580
sales-jp@transmeta.com

ASIA-PACIFIC

Transmeta Taiwan
7F-1, No.167,
Fu-Hsing North Road
Taipei, Taiwan
R.O.C. 105
Tel: 886-2-2718-0999
sales-tw@transmeta.com

EUROPE

Transmeta Europe
9 Eglinton Road
Bray
County Wicklow
Ireland
Tel: +353-87-6838295
sales-eur@transmeta.com

QUALITY MANAGEMENT SYSTEM
CERTIFIED BY DNV
ISO 9001:2000