

A High-Performance/Low-Power

MIPS® (SOC) 400MHz at .5 Watt

Overview

The AMD Alchemy™ Solutions Aul000™ processor provides a high-performance, low-power, high-integration system-on-a-chip (SOC) targeting the Internet Edge market. These devices include WAPs (Wireless Access Points), routers, gateways, printers, point of sale terminals, set top boxes and Internet security products, such as firewalls and VPNs (Virtual Private Networking).

Product Description

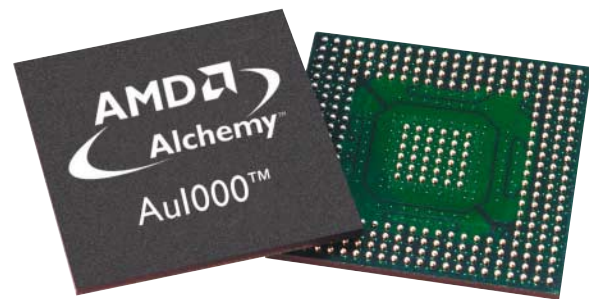
The Aul000 delivers a complete SOC based on the MIPS32™ instruction set. Designed for optimal performance at very low power, the Aul000 runs at up to 500MHz. Power dissipation measures less than half a watt for the 400MHz version. Highly integrated with on-chip memory controllers and Internet access peripherals, the Aul000 runs a variety of operating systems, including Windows® CE.NET, Linux and VxWorks. Moreover, the integration of peripherals with AMD's unique, very high performance, MIPS-compatible core can provide lower system costs, smaller form factors, lower system power requirements, simpler designs at multiple performance points, and shorter design cycles.

High Speed MIPS® CPU Core

- 266, 400 or 500MHz
- MIPS32 Instruction Set
- 32-Bit Architecture
- 16KB Instruction and 16KB Data Caches
- High Speed Multiply-Accumulate (MAC) and Divide Unit
- 1.5 - 1.8V Core, 3.3V I/O

Highly-Integrated System Peripherals

- GPIO (32 total, 6 dedicated)
- Two 10/100 Ethernet Controllers
- USB Device and Host
- Four UARTs
- IrDA Controller (SIR, MIR, FIR)
- AC-97 Controller
- I²S Controller
- Two SSI's



High Bandwidth Memory Buses

- I00/I25MHz SDRAM Controller
- SRAM/Flash EPROM Controller

Low Power Consumption

Core MHz	Power (mW)
266	<300
400	500
500	900

- Power Saving Modes
 - Idle
 - Sleep
- Pseudo-static Design to 0Hz

Package

- 324 PBGA
- 23mm x 23mm

Operating System Support

- Microsoft® Windows® CE.NET
- Linux
- VxWorks

Development Tool Support

- MIPS32 Compatible Tool Set
- Numerous Third-Party Compiler, Assemblers and Debuggers

AMD Alchemy™ Solutions Au1000™ Processor

Internet Edge Processor

Core Microarchitecture

Highlights Pipeline

- Scalar 5-stage Pipeline
- Load/Store Adder in I-stage
- Scalar Branch Techniques Optimized
- Pipelined Register File Access in Fetch Stage
- Zero Penalty Branch

Multiply-Accumulate (MAC) and Divide Unit

- Max Issue Rate of one 32x16 MAC per Clock
- Max Issues Rate of one 32x32 MAC per Every Other Clock
- Operates in Parallel to CPU Pipeline
- Executes all Integer Multiply and Divide Instructions
- 32 x 16-Bit MAC Hardware

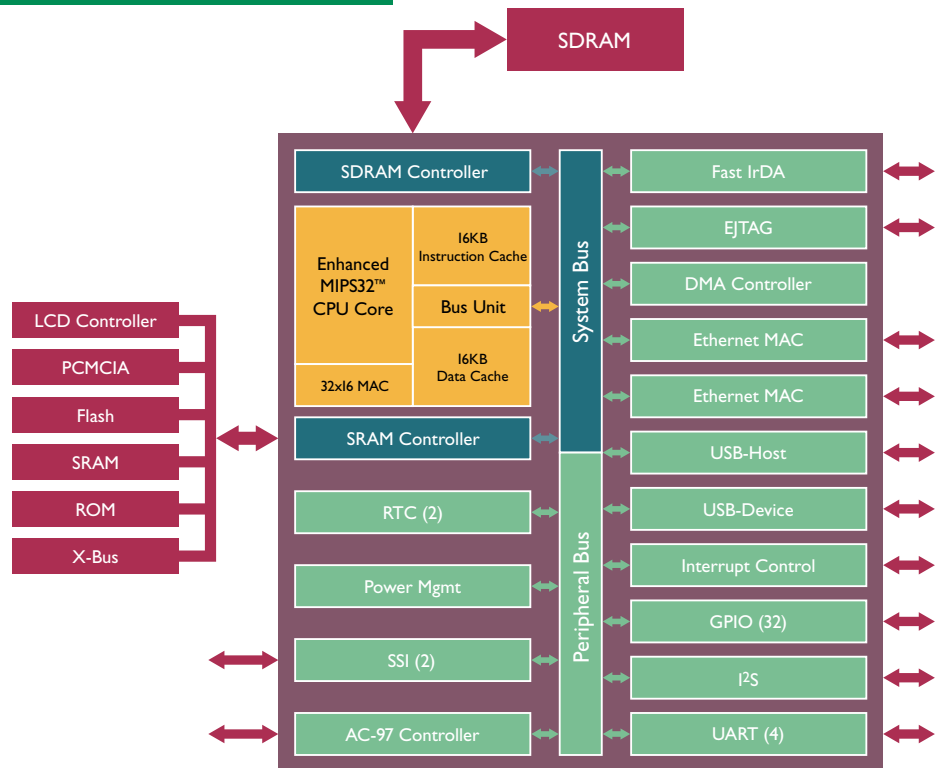
MMU

- Instruction and Data Watch Registers for Software Breakpoints
- Separate Interrupt Exception Vector
- TLB
 - 32 Dual-entry Fully Associative
 - Variable Page Sizes 4KB-16MB
 - 4-entry ITB

EJTAG Support

Caches

- 16KB Non-Blocking Data Cache
- 16KB Instruction Cache



Caches

- Instruction/Data Caches are 4-way, Set Associative
- Write-Back with Read-Allocate
- Cache Management Features
 - Programmable Allocation Policy
 - Line Locking
 - Prefetch Instruction (instructions and data)
- High-speed Access to On-chip Buses

Low Power Consumption

Core MHz	Core Voltage	Power (mW)
266	1.5	<300
400	1.5	500
500	1.8	900

- Power Saving Modes
 - Idle
 - Sleep
- Pseudo-static design to 0Hz

About AMD

AMD is a global supplier of integrated circuits for the personal and networked computer and communications markets with manufacturing facilities in the United States, Europe, Japan, and Asia.

AMD, a Fortune 500 and Standard & Poor's 500 company, produces micro-processors, flash memory devices, and support circuitry for communications and networking applications.

Founded in 1969 and based in Sunnyvale, California, AMD had revenues of \$3.9 billion in 2001. (NYSE: AMD)

AMD
www.amd.com

One AMD Place
P.O. Box 3453,
Sunnyvale, CA 94088-3453, USA
Tel: 408-732-2400 or 800-538-8450
TWX: 910-339-9280
TELEX: 34-6306

Technical Support

USA & Canada: 800-222-9323 or 408-749-5703
USA & Canada PC Microprocessor:
408-749-3060
USA & Canada Email: hw.support@amd.com

Latin America Email:
latinamerica.support@amd.com

Europe & UK: +44-0-1276-803299

Fax: +44-0-1276-803298

France: 0800-908-621

Germany: 089-450-53199

Italy: 800-877224

Europe Email: euro.tech@amd.com

Far East Fax: 852-2956-0588

Japan Fax: 81-3-3346-7848

Literature Ordering

On the Web: www.amd.com/support/literature.html

USA & Canada: 800-222-9323

Europe Email: euro.lit@amd.com

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