

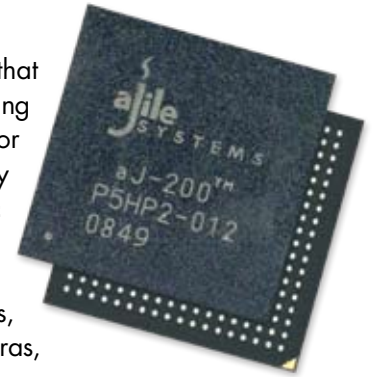
Real-Time Multimedia Direct Execution SoC for Java™ Platforms



Overview

The ajile Systems aJ-200 is the third device in a family of system-on-a-chip SOC that executes both Java Virtual Machine (JVM) bytecode instructions, and real-time Java threading primitives. The native JVM bytecode implementation eliminates the typical interpreter or JIT software layers, and provides the most optimal Java performance in both memory requirements and execution time. The Java threading primitives ensure fast, atomic executive operations like context switching, object synchronization, scheduling and interrupt processing, and provide an embedded RTOS kernel.

The aJ-200 is ideally suited to power the next generation of the mobile POS terminals, handheld devices, webpads, personal navigation systems, gaming and toy devices, IP cameras, video surveillance systems, and thin clients.



Features

32-bit Direct Execution Java Processor

- Native JVM bytecode instructions
- Extended bytecode instructions
- IEEE-754 floating-point arithmetic
- Fixed-point Multiplier Accumulator (MAC)
- Embedded RTOS kernel
 - Thread-to-thread yield in less than 1µsec
- Two independent JVM's in hardware
- 32 KB writeable control store (WCS)

32 KB Unified instruction & Data Cache

External Bus Interface (EBI)

- FLASH (NOR & NAND), ROM, SRAM
- SDRAM and mobile SDRAM

Peripheral Interrupt Controller

Three 24-bit Timer/counters

Eight Pulse Width Modulations (PWM's)

Watchdog Timer

Real Time Clock (battery backup)

Four 16550 Compatible UART's

General Purpose I/O Ports

DMA Controller

Synchronous Serial Port (SSP)

I²S/AC97/SPI

I²C Interface

SD/ SDIO/ MMC Memory Card Interface

CF Memory Card Interface version 1.4

Single-chip USB OTG Controller version 2.0

Single-chip 10/100 T-Base Ethernet Controller

Encryption/decryption Engine

LCD Controller

- 24-bit TFT LCD panel interface
- Resolution up to 1280 x 1280
- Input modes (RGB, color palette, YcbCr422/420)
- 256 entries 16-bit RGB color palette RAM
- Two PiP windows
- Picture out of Picture (PoP)
- Output formats (RGB parallel, ITU-R BT. 656)
- Video Scalar (up & down)
- Video Output Port (ITU-R BT. 656)

Three Image Capture Ports

- Resolution up 1920 x 1080
- Input formats (ITU-R BT. 656/.1120, YCrCb 4:2:2)
- Output formats (RGB 888/565, YCbCr 4:4:4, 4:2:2, 4:2:0)

MediaCodec

- MPEG-4 simple profile L0 ~ L3 standards
- Sub QCIF, QCIF, CIF, VGA, 4CIF, & D1
- JPEG (ISO/IEC 10918-1) base-line standard
- Short video header (H.263 baseline)
- H.263/MPEG/JPEG quantization methods

IEEE 1149.1 (JTAG) Interface

Clock and PLL's

Fully static operation up to 180 MHz

- Core @ 1.8V
- I/O's @ 1.8, 2.5V or 3.3V
- Commercial temperature

Implemented in 0.18µm CMOS process

Package

- 324-pin TFBGA
- 13 mm x 13 mm (0.65 mm ball pitch)
- ROHS compliance

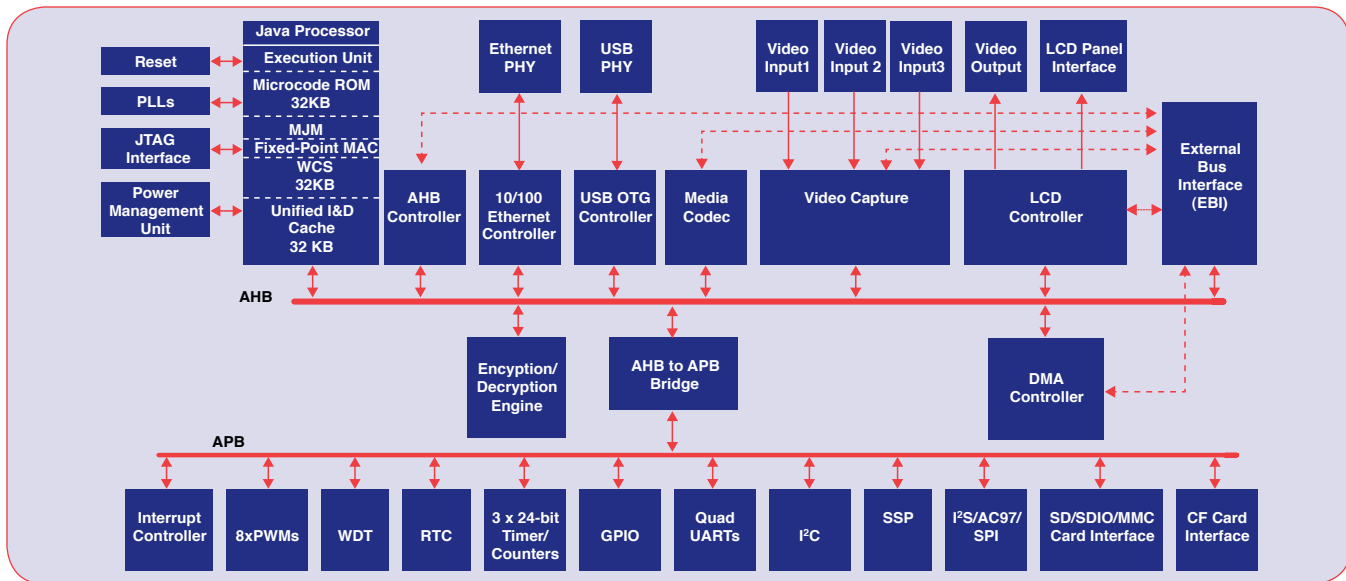


Figure 1. Block Diagram of aJ-200

System Development Support

The aJ-200 SoC bundled with the aJile RTOS, an optimizing application builder (JEMBuilder), debugging tools and an evaluation board provides a complete silicon-based solution for the JME platform. The key components are:

aJile RTOS

The aJile RTOS is implemented entirely in Java as illustrated in figure 2. In addition, the aJile Multiple JVM (MJM) enables multiple applications to execute concurrently and independently in a deterministic, times-liced schedule. This allows hard real-time applications to run independently and safely exist with networked applications.

Development Tools

The development environment allows the use of any off-the-shelf IDE that produces Java standard class files such as Eclipse or Netbeans. It consists of the following key components:

- Optimizing Linker/Application Builder (JEMBuilder)
- Application Debugging Tools
- Evaluation kit " aJ-200evb"

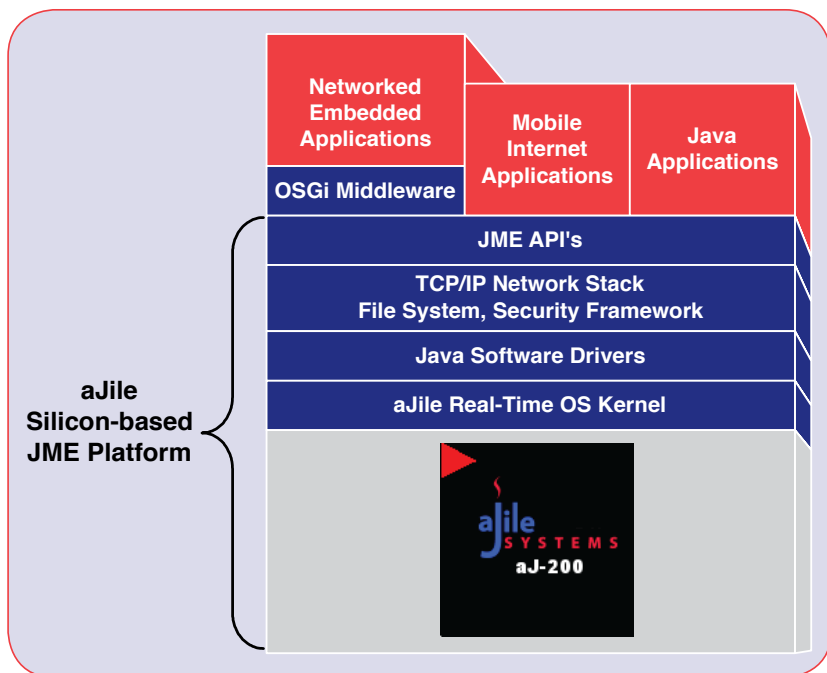


Figure 2. The silicon-based JME Platform



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