

i.MX37 Multimedia Applications Processor

Overview

Take your portable multimedia applications to the next level of performance with Freescale's i.MX37 multimedia applications processor. The i.MX37 processor is ideal for mobile multimedia applications such as portable media players, portable navigation devices, mobile internet devices and Web tablets. Fixed multimedia applications such as digital photo and video frames, media adaptors and extenders, as well as video displays and kiosks will also benefit from the i.MX37 processor's wide array of multimedia features.

The i.MX37 multimedia applications processor is based on an ARM1176JZF-S™ core with an L2 cache and features a multi-format hardware video decoder that is designed to reduce power consumption. Proprietary power management technology also enables the i.MX37 processor to run a feature-rich operating system such as Linux® or Windows® CE while offering even lower power for less bandwidth-intensive applications such as stereo audio decoding, stretching the battery life of portable devices.

Features

CPU Complex

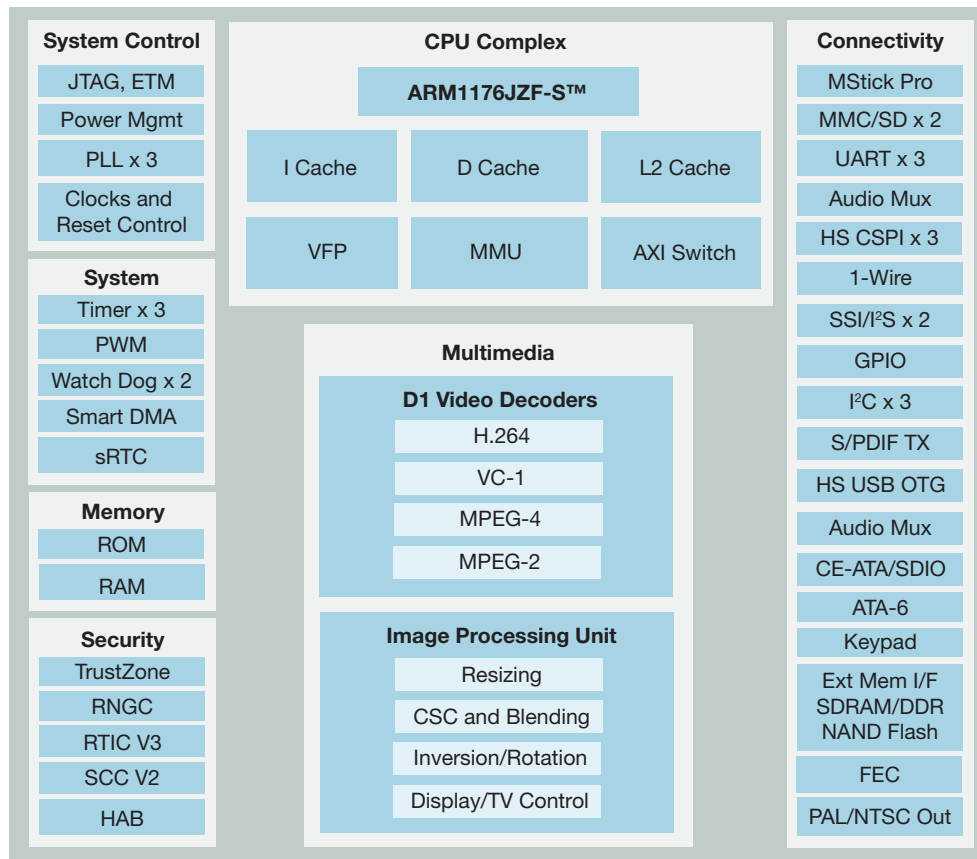
- ARM1176JZF-S core
- Unified L2 cache
- Jazelle® Java® acceleration
- Vector floating point coprocessor (VFP)

Multimedia

- Multi-format video decode hardware acceleration
- 24-bit display support up to XGA resolution
- Image and video resize, inversion and rotation hardware
- Deblocking, deringing, alpha blending and color space conversion
- PAL/NTSC component, composite or

S-Video output

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External Memory Interface

- SDRAM 16/32-bit, 133 MHz
- Mobile DDR 16/32-bit, 333/266 MHz
- SLC, MLC NAND flash 8/16-bit

Advanced Power Management

- Multiple independent power domains
- Dynamic voltage and frequency scaling
- Proprietary power gating

Connectivity

- High-Speed USB OTG with PHY
- 3 x MMC/SDIO up to 8-bit at 52 MHz
- Memory Stick/Memory Stick Pro
- ATA-6

- CE-ATA
- S/PDIF TX
- Configurable High-Speed SPI x 3, SSI/I²S x 3, UART x 3
- Fast Ethernet Controller (FEC)

Performance

- Up to 532 MHz at 1.0V core voltage
- Up to 200 MHz at 0.8V core voltage

General

- 302 ball, 10 mm x 10 mm, 0.5 mm pitch MAPBGA package
- -20°C to +70°C temperature range

Benefits

The i.MX37 multimedia processors are built using Freescale's Smart Speed™ technology with some powerful enhancements. Proprietary power gating techniques are used to enable low-power operation of the device in specific reduced performance use cases such as audio playback to run at voltages as low as 0.8V. This is balanced by enabling high-performance applications requiring up to 532 MHz and allowing the CPU core to run at voltages as low as 1.0V. Automatic Dynamic Voltage and Frequency Scaling (DVFS) allows on-the-fly frequency adjustment according to the performance requirements of the system. The i.MX37 processor also offers an abundance of different power saving modes.

Image Processing Unit

The i.MX37 processor features Freescale's image processing unit (IPU) to date, supporting up to XGA resolution and 24-bit color depth. The IPU includes the functionality required for image processing and display management, including deblocking, deringing, color space conversion, independent horizontal and vertical resizing, blending of graphics and video planes, and rotation in parallel with video decoding. The IPU is equipped with powerful control and synchronization capabilities to perform tasks with minimal to no involvement of the ARM® CPU.

Multimedia Hardware

When used in conjunction with the IPU, the i.MX37 multimedia hardware accelerator delivers the rich playback experience required on high-resolution portable video devices. The multimedia hardware contains logic that decodes industry standard video formats such as MPEG-4, H.264, WMV/VC-1, MPEG-2 and H.263 up to 576 x 720 resolution which offloads the ARM CPU. This allows the processor to deliver a rich user interface blended with video playback for an uncompromised handheld user experience. The i.MX37 processor also

includes an integrated PAL/NTSC encoder with triple video DACs to deliver that same uncompromised experience on larger displays over component, composite or S-video interfaces.

Level 2 Cache Controller

Freescale was the lead partner in formulating the definition of the ARM11™ L2 cache controller architecture and was the first ARM partner to license it. Freescale's level 2 cache controller, containing an ARML210™ core, and the accompanying memory, combined with the ARM1176JZF-S processor, can increase CPU performance from 25 to 75 percent and reduce system-level power consumption. By bringing more data on-chip, and closer to the CPU, the ARML210 L2 cache controller helps remove the performance-limiting bandwidth constraints associated with off-chip memory.

Security Features

Freescale's i.MX37 processor incorporates Freescale's platform independent security architecture, a combination of security features that provides a high level of confidence for service providers, content providers and consumers. The i.MX37 security architecture is a blended hardware/software solution. The i.MX37 processor features electronically blown fuses that enable design engineers to hardwire their devices' IDs, security codes and other data into the i.MX37 processor's E-Fuse Box. Other security features include:

- ARM TrustZone technology in the ARM1176JZF-S CPU Core
- Memory management unit (MMU)
- Security controller (SCC), including secure RAM and security monitor
- Random number generator accelerator (RNGA)
- Secure JTAG controller (with optional JTAG disabling)
- Universal unique identification
- Run-time integrity checker (RTIC), including SHA-1 accelerator

- High assurance boot (HAB)
- Tamper detection

For service providers, the security architecture helps to protect against malicious service attacks, theft of services, configuration protection and concerns with cloning. For content providers, it helps to block against illegal access to licensed content, thereby protecting against unauthorized use and distribution. And for consumers it helps to block access to private data, helping protect against identify theft.

Product Development Kit

The i.MX37 product development kit (PDK), is an integrated hardware and software solution that simplifies product development so developers can focus on critical differentiation needed for market success. Freescale offers comprehensive board support packages for both Linux and Windows CE operating systems with the PDK as well as optimized middleware such as audio and video codecs and digital rights management libraries.

Freescale Developer Network

Combining resources from Freescale and industry leaders, the Freescale Developer Network offers advanced pre-integrated platforms and solutions designed to work out-of-the-box, accelerating your business and giving you an advantage.

The Freescale Developer Network is a global program created to bring comprehensive platforms to market that include hardware and software solutions, tools, systems integration, consulting and other services. With early access to improved tools, Freescale Developer Network members are better equipped to deliver mobile and wireless solutions to a global audience in less time, with less effort and at a lower cost. For more information about the Freescale Developer Network, visit www.freescale.com/fwdn

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