Applications Processors

i.MX21 Processor

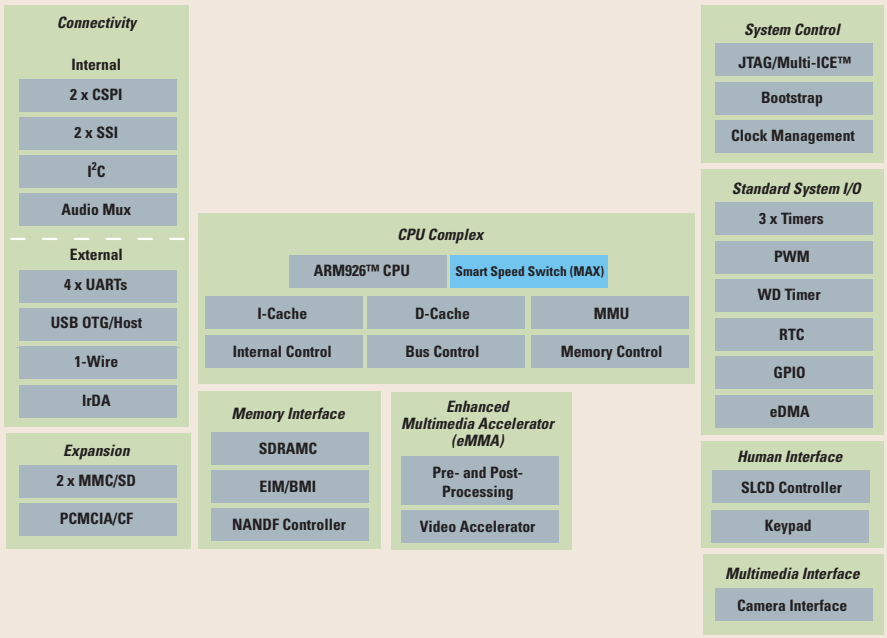
Overview

As the newest member of Freescale's i.MX family of applications processors, the i.MX21 is your key to robust multimedia applications, with higher levels of video and graphics capabilities, plug-and-play connectivity and added power management features than ever before offered by this family.

Based on ARM® core technology and designed for use in smartphones, wireless PDAs, mobile entertainment and many other mobile wireless applications, Freescale's i.MXL, i.MX1, and now, the i.MX21 are engineered to offer Smart Speed—low power consumption with MHz performance to spare, and a high degree of integration to reduce your design time significantly. For example, the i.MX21 offers CIF 30 fps video encode and decode, sending an e-mail message while playing an MP3 or videoconferencing at 15 fps with a 35 percent to 65 percent reduction in power consumption.*

The i.MX21 multimedia applications processor provides an exceptional video experience via special video decode/encode features and the ultimate 2-D/3-D experience, thanks to a bus master interface (BMI) to external graphics chips. USB On-The-Go (USB-OTG) offers plug-and-play connectivity. Additionally, i.MX21 provides minimized battery drain, thanks to smart power management features.

i.MX21 APPLICATIONS PROCESSOR BLOCK DIAGRAM



The i.MX Family supports a broad range of platforms such as those based on the Microsoft® Windows® CE, Palm OS®, Symbian OS™ and Linux® operating systems.

The i.MX family of applications processors is part of Freescale's groundbreaking i.250 and i.300 Innovative Convergence™ platforms: Silicon-to-software solutions to help designers get to market fast with 2.5G and 3G wireless products. Freescale already offers total smartphone reference platforms with the i.MX1 and i.MXL, which leverages its proven experience in wireless mobile devices and helps shorten time-to-market for the next generation of mobile devices.

The i.MX21 helps you harness the power of wireless, mobile multimedia and the Internet as never before.

*Improvement over i.MX1

Launched by Motorola

freescale™ semiconductor

Features

CPU Complex

> ARM926EJ-S™ core (16 KB I-Cache, 16 KB D-Cache)

> ARM Jazelle™ technology for Java™ acceleration

> Smart Speed Switch

Human Interface

> 16/18-bit color LCD controller up to SVGA

> Smart panels support (SLCDC)

Connectivity

> 4 x UARTs, IrDA (MIR and FIR)

> USB On-The-Go (two-host port)

Expansion

> Dual slot MMC and SD/SDIO card interface

> PCMCIA support

Multimedia

> MPEG-4 and H.263 encode/decode acceleration up to CIF 30 fps

> High-speed CMOS sensor I/F and I^2C

> External bus master I/F

Special Functions

> NAND Flash controller

> 16-channel DMA

> 16/32-bit SDRAM controller

Performance

> CPU complex: starting at 266 MHz

> System: 133 MHz @ 1.8V

Technology

> 289 ball, 0.65 mm pitch MAPBGA

> 0.13 µm

Benefits

Enhanced Video Capabilities

The i.MX21 is the first applications processor with a built-in, low-power eMMA hardware block, which consists of an MPEG-4 and H.263 encoder/decoder and image pre-processing and post-processing stages. These features provide exceptional image and video quality. Devices with the i.MX21 are capable of long video playback time with exceptional video quality (high frame rates and large screen resolution support). The i.MX21 provides flexibility for software implementation for other video encoders, such as PacketVideo®, RealNetworks® and Windows Media™. Hardware code addresses the I/O bottleneck and helps to reduce power consumption, enabling greater device mobility.

Exceptional Graphics

You can offer users a great experience watching video and running graphics-intensive applications such as 3-D gaming. The i.MX21 elevates overall system performance through a bus master interface that reduces the overhead to external multimedia coprocessors such as those from ATI Technology, Inc. Advanced graphics software standard APIs such as Mobile Java™ 3D and OpenGL®-ES as well as 3-D software engines such as Superscape®, HI Corp® and Fathammer™ are also supported.

Power Management

All the robust features in the world don't do you much good if your device can't go the distance. The i.MX21 enables power-aware and power-optimized multimedia applications through effective system clock distribution, low current leakage control and frequency change on the fly.

Smart Speed Switch

Our Smart Speed Switch allows you to achieve true parallelism resulting in more effective data per CPU cycle. The switch allows up to four simultaneous transactions, which can provide the effective throughput of a 532 MHz bus. This allows enriched multimedia experiences, such as V2oIP, with exceptional quality that exceeds the performance of higher MHz processors.

USB On-The-Go (USB-OTG)

The i.MX21 is at the forefront in the applications processors market in providing a dedicated OTG port for an external OTG transceiver. It has two USB hosts to work with other PC peripherals without PC involvement, providing ease of connectivity to smart handheld devices while consumers are on the go. It's a less expensive solution than an external module.

Tools and Development Support

Metrowerks' CodeWarrior™ Development System—ARM Architectures for i.MX offers you a fully integrated development environment to design, debug and deploy solutions for handheld devices, all from one graphical user interface.

AgentM Network

Freescale's AgentM Network is designed to provide you with the platforms, tools, technology and expertise to get your product to market faster. With early access to the newest tools, AgentM members are better equipped to deliver mobile wireless solutions to a global audience in less time, with less effort, and at a lower cost. Join the AgentM Network and accelerate your next development project. For details, and to become an agent today, visit **www.freescale.com/agentm**.

To learn more about the i.MX Family and the Innovative Convergence portfolio, visit **www.freescale.com/imx**.

Learn More: For more information about Freescale products, please visit **www.freescale.com**.

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