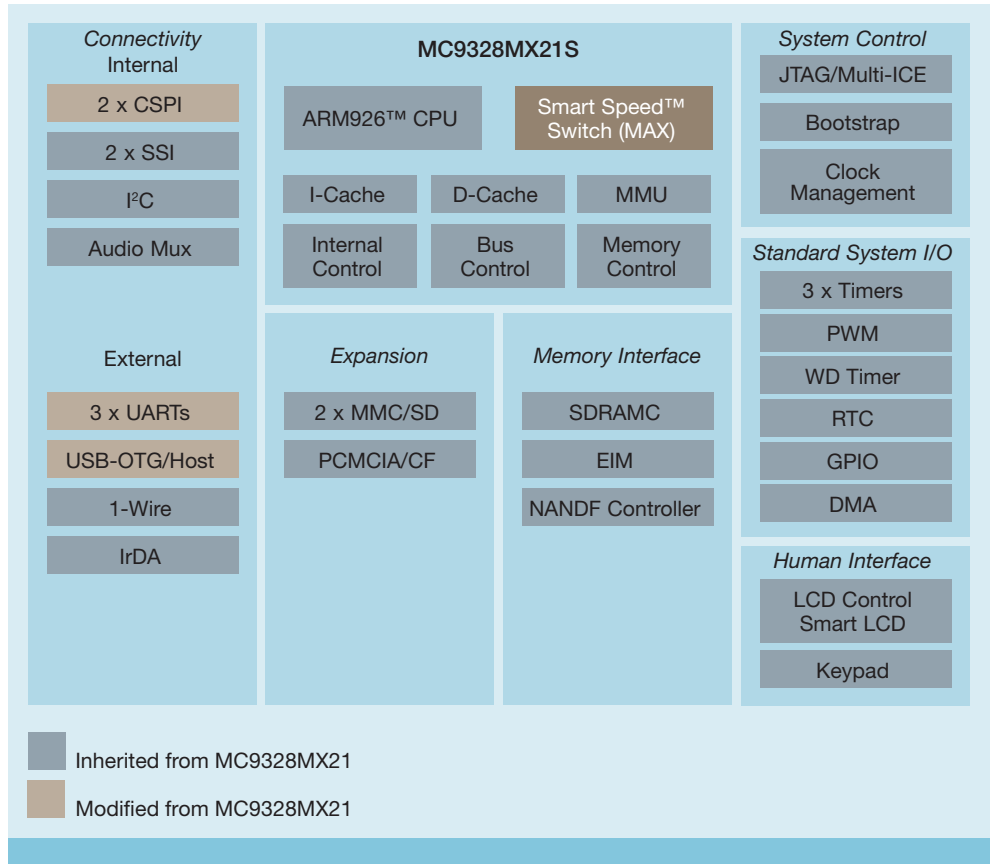# i.MX21S Processor

Key Features

Design engineers seeking the performance of a 266 MHz ARM® CPU, but who do not require high-resolution video and graphics capabilities now have a compelling new choice from Freescale; the i.MX21S applications processor.

Derived from the popular i.MX21 multimedia applications processor, the i.MX21S applications processor retains many key features, including expansion slots and several connectivity options, such as USB On-The-Go (USB-OTG) for plug-and-play connectivity. This makes it well suited for a host of cost-sensitive applications, including health care devices, fire and security equipment, education products and industrial automation.

It is also a wise choice for automotive, video surveillance, consumer electronics and low-tier mobile handsets—depending on the design requirements.

The i.MX21S applications processor is architected with Smart Speed™ technology, an intelligent integrative approach that uses hardware accelerators to offload the CPU, and a crossbar switch to bring parallelism to the system. The result is a processor that performs like a much higher MHz device, but conserves power for long, long battery life. The i.MX family supports a broad range of platforms, such as those based on the Microsoft® Windows® CE, Symbian OS™, Linux® OS and a number of leading RTOSs.

The i.MX family of applications processors offers a broad range of performance capabilities and price points enabling designers and OEMs to base entire product lines on a common platform. Freescale provides comprehensive hardware and software solutions, along with third-party tools and application engineering support, to accelerate your design time and get products to market faster.

i.MX21S Applications Processor Block Diagram

Connectivity Internal	MC9328MX21S	System Control

Connectivity — Internal
- 2 x CSPI
- 2 x SSI
- I²C
- Audio Mux

MC9328MX21S
- ARM926™ CPU
- Smart Speed™ Switch (MAX)
- I-Cache
- D-Cache
- MMU
- Internal Control
- Bus Control
- Memory Control

System Control
- JTAG/Multi-ICE
- Bootstrap
- Clock Management

Connectivity — External
- 3 x UARTs
- USB-OTG/Host
- 1-Wire
- IrDA

Expansion
- 2 x MMC/SD
- PCMCIA/CF

Memory Interface
- SDRAMC
- EIM
- NANDF Controller

Standard System I/O
- 3 x Timers
- PWM
- WD Timer
- RTC
- GPIO
- DMA

Human Interface
- LCD Control Smart LCD
- Keypad

- Inherited from MC9328MX21
- Modified from MC9328MX21

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

- 3 x UARTs, IrDA (MIR and FIR)
- USB-OTG (one full-speed host)
- I²C
- One wire
- 8 x 8 keypad
- Two configurable SPIs

Expansion

- Dual-slot MMC and SD/SDIO
  card interface
- PCMCIA support

Special Functions

- NAND flash controller
- 16-channel direct memory access (DMA)
- 16/32-bit SDRAM controller

Performance

- CPU complex: 266 MHz
- System: 133 MHz @ 1.8V

Technology

- 289 MAPBGA, 14 x 14 mm, 0.65 mm pitch
- 0.13 μm

Benefits

Power Management

All the robust features in the world will not do you much good if your device can't go the distance. The i.MX21S applications processor enables power-aware and power-optimized multimedia applications through effective system clock distribution and low current leakage.

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 three simultaneous transactions, which can provide the effective throughput of a 400 MHz bus.

While slowing down the CPU, a design engineer can take advantage of the architecture to achieve high performance while maintaining low-power capabilities. This gives the developer greater flexibility when choosing to use either software running on the ARM core only, or leveraging enhanced functionality to achieve parallelism and lower power when using the various IP blocks within the system. Freescale's combination of power saving techniques and specialized processing IP blocks enables greater processing capabilities with lower clock speeds, resulting in longer battery life.

USB-OTG

The i.MX21S applications processor is at the forefront in the applications processors market in providing a dedicated OTG port for an external OTG transceiver. It has one USB host 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 cost-effective solution for an external module.

Freescale Developer Network

The Freescale Developer Network is a global program designed to provide platforms, tools, technology and expertise to get products to market faster. This program offers platforms that include hardware, software, tools, systems integration and other services as pre-integrated solutions to help shorten product development cycles. With early access to tools, our partners are better equipped to deliver cost-effective mobile wireless solutions to a world audience in less time and with less effort.

Learn More: To learn more about the i.MX21S, please visit **www.freescale.com/imx**.