i.MX537 Applications Processor

Enabling enhanced graphics and connectivity for industrial and medical devices

Overview

The i.MX53 family of processors represents Freescale's next generation of advanced multimedia and power-efficient implementation of the ARM® Cortex™-A8 core. With core processing speeds up to 800 MHz, the i.MX537 is optimized for both performance and power to meet the demands of high-end, advanced applications. An integrated display controller, 1080p HD video decode and 720p video encode, enhanced graphics and connectivity features make the i.MX537 ideal for a wide range of applications that require rich user interfaces with high color displays, such as patient monitors and human-machine interfaces (HMI).

Software Flexibility

Development on the i.MX537 is made easier with Freescale board support packages optimized for multimedia and low-power operation. BSPs are available for the following operating systems:

- Android™
- Windows® Embedded Compact 7
- Linux®

Industrial Needs

Like the rest of the i.MX portfolio, the i.MX537 processor provides key environmental differentiators for the industrial market. These include 3.3-volt I/O support, an 0.8 mm pitch package to reduce PCB and manufacturing costs, extended temperature coverage for harsh environments, industrial qualification for extended reliability, a formal long product supply guarantee to support product life spans and a strong ecosystem, including module manufacturers, software integrators and development tools.

Target Applications

- HMI for appliances, building control, factory/home automation, printers and security panels
- Patient monitors
- Point of sale terminals
- Surveillance cameras
- Security
- Digital signage
- Telehealth
- Barcode scanners

Benefits

- Ultra-fast processing and high-performance multimedia capabilities
- Complete hardware and software package provided to enable faster time to market and lower R&D investment
- Dedicated video and graphics hardware acceleration engines provides best-in-class performance for power
- Multi-standard HD 1080p decode
- HD 720p-ready videoconferencing
- Up to 2 GB external memory support prepares your end device for advanced computing applications and future OSs and browsers
- LP-DDR2, LV-DDR2, DDR2 and DDR3 ready for greater design flexibility
- Optimized for low-power operation to provide optimal performance for battery life
- Smartly integrated i.MX53 offers more on chip, including LVDS, USB PHYs, Ethernet and SATA, reducing the need for external components and passing on significant BOM cost savings

Features

CPU Complex

- 800 MHz ARM Cortex-A8 CPU
- 32 KB instruction and data caches
- Unified 256 KB L2 cache
- NEON SIMD media accelerator
- Vector floating point coprocessor

Multimedia

- OpenGL® ES 2.0 and OpenVG™ 1.1 hardware accelerators
- Multi-format HD 1080p video decoder and HD 720p video encoder hardware engine
- 24-bit primary display support up to WSXGA resolution
- 18-bit secondary display support
- Analog HD 720p component TV output
- High-quality hardware video de-interlacing
- Image and video resize, inversion and rotation hardware
- Alpha blending and color space conversion
- Video/graphics combining: four planes plus hardware cursor
- Display quality enhancement: color correction, gamut mapping and gamma correction

External Memory Interface

- Up to 2 GB LP-DDR2, DDR2, LV-DDR2 and DDR3 SDRAM, 16/32-bit
- SLC/MLC NAND flash, 8/16-bit

Advanced Power Management

- Multiple independent power domains
- Dynamic voltage and frequency scaling

Connectivity

- High-Speed USB 2.0 OTG with PHY
- High-Speed USB 2.0 Host with PHY
- Two additional High-Speed USB controllers
- Integrated LVDS display interface
- Wide array of serial interfaces, including SDIO, SPI, I²C and UART

- I²S and S/PDIF audio interfaces
- 10/100 Ethernet controller with hardware capability to support IEEE® 1588 time stamping
- PATA
- SATA controller and PHY up to 1.5 Gbps
- CAN

Security

- Security controller, including secure RAM and security monitor
- High assurance boot, JTAG controller and real-time clock
- Cipher and random number generator accelerators
- Run-time integrity checker
- Universal unique identification
- Tamper detection

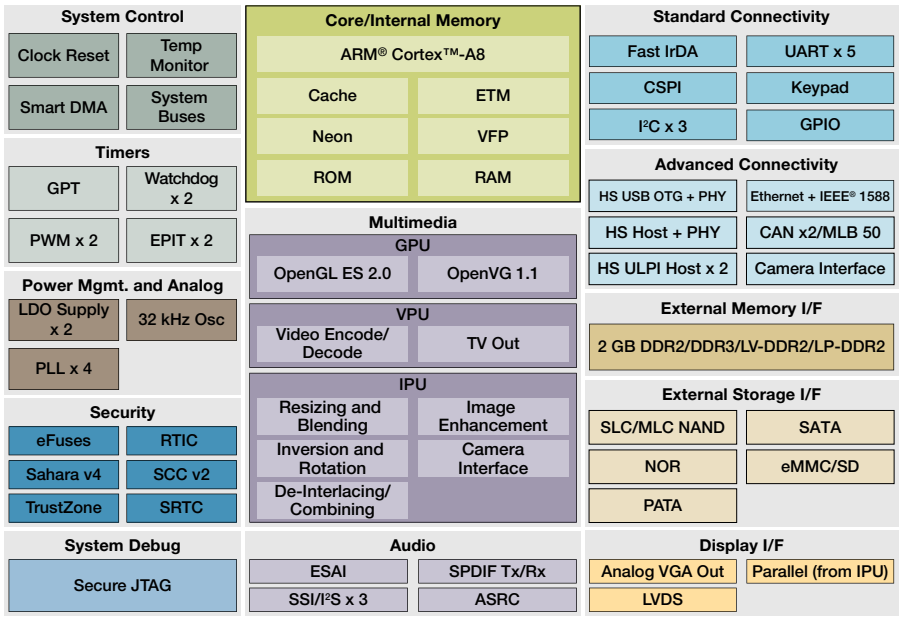
General

- 19 x 19 mm, 0.8 mm pitch TEPBGA-2 package
- Industrial temperature grade offered

Multimedia Powerhouse

The multimedia performance of the i.MX53 processor is boosted by a multi-standard hardware video codec, autonomous image processing HD unit, NEON SIMD, accelerometer, Vector Floating Point coprocessor and a programmable Smart DMA (SDMA) controller. Powerful 3-D graphics acceleration is the key to mobile game designs. The i.MX537 processor provides an integrated 3-D graphics processing unit that provides an incredible 33 Mtri/sec and effective 800 Mpix/sec (with overdraw). The 3-D unit is provides an exceptional user experience with hardware-accelerated Flash Player 10.x, gaming and advanced user interfaces. In addition, i.MX537 incorporates a 2-D graphics processing unit to accelerate the windowing system and fonts.

i.MX53 Block Diagram



Ordering Information

Part Number	Description	MSRP (USD)
MCIMX53-START	i.MX53 Quick Start development board	$149
MCIMXHDMICARD	Optional HDMI board	$49
MCIMX-LVDS1	10.1" 1024 x 768 LVDS panel with capacitive touch screen	$499
MCIMX28LCD	Optional 4.3" WVGA TFT LCD	$199
MCIMX53SMD	SABRE for tablet	$1499

Smart Speed™ Technology

Advanced power management features throughout the i.MX53 processor enable a rich suite of multimedia features and peripherals while maintaining minimum system power consumption in active and low-power modes.

Get Started Today

The i.MX53 Quick Start board is a $149 open source development platform that supports the features of the i.MX53 applications processor and includes support for a VGA display as well as optional add-on boards to support LVDS, LCD and HDMI displays. For more information, visit **freescale.com/iMXQuickStart**.

The Smart Application Blueprint for Rapid Engineering (SABRE) platform for tablets based on the i.MX53 is the latest in a series of high-performance, market-focused reference designs engineered to introduce designers to advanced multimedia and connectivity applications on the i.MX53 applications processor. Designed with a tablet look and feel, the SABRE platform can be targeted toward any ultra low-power mobile device to enable an amazing user experience. For more information, visit **freescale.com/iMXSABRE**.

For current information about Freescale products and documentation, please visit freescale.com/iMX53

Join fellow i.MX developers at imxcommunity.org

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