Overview
The i.MX515 represents Freescale Semiconductor’s latest achievement in integrated applications processors. This solution is part of a growing family of multimedia-focused products offering high-performance processing optimized for low power consumption.

The i.MX515 processor features Freescale’s advanced and power-efficient implementation of the ARM Cortex™-A8 core, which operates at speeds up to 800 MHz.

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 720p video decoder and D1 video encoder hardware engine
- 24-bit primary display support up to WXGA resolution
- 18-bit secondary display support
- Analog HD720p component TV output
- High-quality hardware video de-interlacing
- Image and video resize, inversion and rotation
- 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
- mDDR and DDR2 SDRAM, 16/32-bit, 200 MHz
- SLC/MLC NAND flash, 8/16-bit

Connectivity
- Fast IrDA
- HS MMC/SDIO x 4
- CSPI HS x 2/LS x 1
- UART x 3
- HS I²C x 3
- I²C x 2
- SSI/I²S x 3
- 1-Wire
- ATA-6
- USB OTG HS+PHY
- USB HS x 3
- SPDIF Tx
- GPIO
- Keypad
- Ethernet
- Ext Memory I/F mDDR 200 MHz DDR2 200 MHz

Advanced Power Management
- Multiple independent power domains
- Dynamic voltage and frequency scaling
- Dynamic process and temperature compensation
- Proprietary power gating

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

System Control
Secure JTAG
Power Mgmt
PLL x 3
Clock Reset

Timers
Timer x 3
PWM x 2
Watch Dog x 2

Memory
ROM 32 KB
RAM 96 KB

Security
Sahara v4
Trust Zone
RTIC
SCC V2
SRTC

Image Processing Unit
Image Signal Processor
Resizing and Blending
Inversion and Rotation
Image Enhancement
Camera

CPU Platform
Cortex A8
32 KB I-Cache
32 KB D-Cache
256 KB L2-Cache
Neon
ETM
Vector Floating Point Unit
Multimedia
OpenGL ES 2.0 + OpenVG 1.1
Hardware Video Codecs
HD720 TV-Out

Connectivity
Fast IrDA
HS MMC/SDIO x 4
CSPI HS x 2/LS x 1
UART x 3
HS I²C x 3
I²C x 2
SSI/I²S x 3
1-Wire
ATA-6
USB OTG HS+PHY
USB HS x 3
SPDIF Tx
GPIO
Keypad
Ethernet
Ext Memory I/F mDDR 200 MHz DDR2 200 MHz

freescale semiconductor
General
- 19 mm x 19 mm, 0.8 mm pitch MAPBGA package
- -20°C to +85°C ambient temperature range
- Automotive temperature grade also available

Benefits
- Very high performance processing and multimedia capabilities
- High level of integration reduces overall system BOM
- Hardware acceleration enables very low power consumption for video and graphics

Netbook/MID Application Processor
i.MX515 processor boosts the capabilities of netbooks and mobile Internet devices with its blazing 800 MHz performance, enabling these devices to deliver a “full-Internet” experience. With Freescale's dynamic voltage and frequency scaling (DVFS), the same core that runs at 800 MHz can scale down to 200 MHz at reduced voltage. This results in significant power reduction for lower MIPS applications.

Multimedia Powerhouse
The multimedia performances of the i.MX515 processor is boosted by a Multi-Standard Hardware Video Codec, Autonomous Image Processing HD Unit (including Image Signal Processor), NEON SIMD, accelerometer and Vector Floating Point coprocessor, and a programmable Smart DMA (SDMA) controller.

Powerful Graphics Acceleration
3-D graphics are the key to mobile game designs. The i.MX515 processor provides an integrated 3-D graphics processing unit that provides an incredible 27 Mtri/sec and effective 664 Mpix/sec (with overdraw). In addition, i.MX515 incorporates a 2-D graphics processing unit to accelerate Adobe® Flash® and OS-windowing system functions.

Smart Speed™ Technology
Advanced power management features used throughout the i.MX515 processor enable a rich suite of multimedia features and peripherals while maintaining minimum system power consumption in both active and low-power modes. Smart Speed technology enables the designer to deliver a feature-rich product at much lower power consumption than competing products.

Increased Security
Because the need for advanced security for mobile devices continues to increase, the i.MX515 processor delivers hardware-enabled security features that support secure e-commerce, digital rights management (DRM), information encryption, secure boot and secure software downloads.

Interface Flexibility
The i.MX515 supports connection to all popular types of external memories: Mobile DDR and DDR2, SDRAM, NOR flash, PSRAM, cellular RAM, NAND flash (MLC and SLC) and OneNAND. Designers seeking to provide products that deliver a rich multimedia experience will find a full suite of on-chip peripherals: LCD controller and CMOS sensor interface, High-Speed USB On-The-Go, three High-Speed USB hosts, multiple expansion card ports (High-Speed MMC/SDIO Host and others), Fast Ethernet controller and a variety of additional interfaces (UART, I^2C, I^2S serial audio, and SIM card and more).

Freescale Alliance Program
Tap into a powerful ecosystem of Freescale technology alliances for building smarter, better connected solutions. Intended to help you shorten your design cycle and get your products to market faster, these technology alliances provide you with access to rich design tools and peripherals, as well as world-class support and training. For more information, visit www.freescale.com/alliances.

Learn More:
For current information about Freescale products and documentation, please visit www.freescale.com/imx515.