

i.MX25 Family of Applications Processors

Industrial/general embedded portfolio:

i.MX253, i.MX257 and i.MX258

Overview

The i.MX25 family of applications processors extends Freescale's ARM9™ portfolio and introduces several key new features such as DDR2, two embedded USB PHYs, 3.3V I/O support, three general-purpose 12-bit ADCs and a touch screen controller that allows customers to reduce their overall system bill of materials cost. In addition, the i.MX25 continues to make the industrial and general embedded market a key focus of i.MX with the integration of 10/100 Ethernet MAC, SD/SDIO/MMC connectivity, up to SVGA (800x600) resolution TFT LCD support, camera sensor interface and 400 MHz CPU speed grade. Improving on the strength of previous i.MX platforms, the i.MX25 processor provides additional tamper detection security that monitors and helps prevent system integrity attacks from hackers, making it the right choice for any type of secure device, whether it's a wired or wireless payment terminal (POS) or secure residential gateway for smart metering. The i.MX25 also complements the i.MX ARM11™ portfolio by maintaining a large share of peripheral commonality with the recently announced i.MX35 applications processor family.

Target Applications

- Secure residential gateway (smart meters)
- Graphical keypads
- Graphical security panels
- "Smart touch" human machine interface (HMI)
- Wired/wireless payment devices
- Barcode scanners
- Factory automation and robotics
- Multifunction portable printers
- Secure devices

Features

CPU

- ARM926EJ-STM runs up to 400 MHz
- Integrated 128K SRAM to improve system performance or low-power LCD refresh

Connectivity

- 10/100 Ethernet MAC
- 2 x FlexCAN modules
- High-Speed USB OTG with PHY
- High-Speed USB host with PHY
- 2 x SD/SDIO/MMC modules
- 2 x subscriber identification modules (SIM)
- 5 x UART
- 2 x configurable serial peripheral interfaces (CSPI)
- 3.3V general purpose I/O

Multimedia and Graphics Processing

- Display controller optimized for up to 16-bit-per-pixel SVGA (800x600) resolution
- CMOS/CCD sensor interface for camera or video input

Memory

- Internal 128K SRAM
- Support for external DDR2, mDDR or SDRAM
- Support for external NAND or NOR flash

Security

- High-assurance boot (HAB) library to provide secure boot
- Secure 47-bit time counter running from 32.768 kHz clock
- Secure 32-bit monotonic counter
- Volatile key storage
- Robust tamper detection and secure key erase
- True random number generator
- User programmable e-fuses
- Secure JTAG

Benefits

CPU Performance and Low Power

400 MHz ARM9 CPU with ample headroom for many industrial and embedded applications while not sacrificing battery life. For plugged-in, always-on devices, the low power consumption of the i.MX25 can improve energy efficiency. The integrated 128K SRAM enables low-power refresh of the display to save power and extend battery life. It can also be used to optimize customer developed algorithms, increasing performance of the product.

Connectivity

With a wide range of connectivity options, such as UART, SDIO, USB and I²C, the i.MX25 processors provide the ability to connect wirelessly to other devices, through the use of off-chip Bluetooth®, Wi-Fi and other wireless protocols. The i.MX25 family also provides off-chip, removable data storage through USB keys and SD cards.

Integration

The i.MX25 processors feature a high level of integration specifically targeted towards the industrial and general embedded market. Integration such as 10/100 Ethernet, touch screen controller, USB PHYs and support for 3.3V I/O helps to reduce the system bill of materials for OEMs, enabling a lower priced end device.

Multimedia

The i.MX25 family of products supports up to SVGA (800x600) resolution TFT displays and allows a wide range of colors to be displayed. The internal DMA within the display controller and the large display buffer improves performance of data rendering to display and reduces the occurrence of flicker.

The camera sensor interface on the i.MX25 has been performance tuned to support the high throughput requirements of data acquisition devices.

Security (i.MX258 only)

The i.MX258 has an advanced security architecture that includes the hardware and software components necessary to provide trusted software boot and protect against external attacks on system integrity. New to the i.MX258 is the Dry-Ice module that not only provides a trusted and certifiable time source, but also provides volatile storage of encryption keys together with robust tamper detection and secure key erase. Also provided is power-loss protection via a back-up power supply to ensure persistence of volatile keys as well as accurate continuous time is kept during SoC power-down. The i.MX258 also contains a true random number generator (TRNG) as well as a pseudo random number generator (PRNG) to achieve both true randomness and cryptographic strength. The randomly generated numbers are intended for direct use as secret keys, per message secrets, random challenges and other similar quantities used in cryptographic algorithms

Development Tools

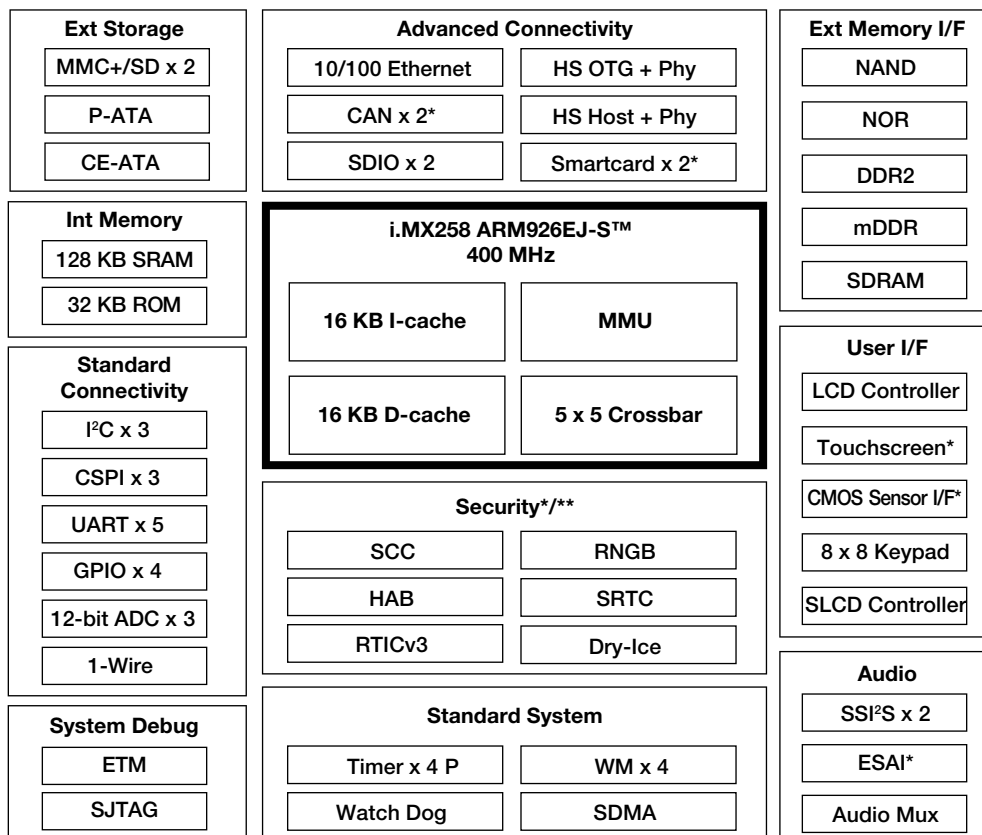
Ordering Information

Freescale offers a feature-rich evaluation kit demonstrating the capabilities of the MCIMX25 running embedded Linux® and Windows® Embedded CE 6.0. The evaluation kit includes support for DDR2, NAND, SDIO, USB, Ethernet and 5.7" landscape VGA TFT LCD.

Product Development Kit

The i.MX25 product development kit (PDK) is a completely integrated hardware and software solution that simplifies product development so

i.MX258 Applications Processor



* indicates this feature is not available on the i.MX253

** indicates this feature is not available on the i.MX257

developers can focus on critical differentiation needed for market success. Freescale offers comprehensive board support packages for both Linux and Windows Embedded CE operating systems with the PDK, as well as optimized middleware such as audio and video codecs and digital rights management libraries.

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.

The i.MX Family

Freescale's i.MX family of applications processors serves a broad range of automotive, consumer, industrial and general-purpose embedded applications. To learn more, visit www.freescale.com/imx.

Package Options

| Part Number | Temp. Range | Package |
|--------------|----------------|------------|
| MCIMX253DVM4 | -20°C to +70°C | 400 MAPBGA |
| MCIMX253CVM4 | -40°C to +85°C | 400 MAPBGA |
| MCIMX257DVM4 | -20°C to +70°C | 400 MAPBGA |
| MCIMX257CVM4 | -40°C to +85°C | 400 MAPBGA |
| MCIMX258CVM4 | -40°C to +85°C | 400 MAPBGA |

Learn More:

For current information about Freescale products and documentation, please visit www.freescale.com/imx25.