

Automotive Infotainment

# i.MX25 Family of Applications Processors

## Automotive portfolio: i.MX251 and i.MX255



### Overview

Today's drivers expect more connectivity in more places from more things—phones, media players and, increasingly, cars. Bluetooth® connectivity is becoming the norm as more people keep their hands on the wheel instead of on the phone. Connectivity and compatibility with media players is becoming a requirement as consumers' media investment goes digital. Originally these features were available only in the center stack of high-end vehicles, but automotive manufacturers now see the value of supporting connectivity in entry-level models where consumers are becoming more media-savvy.

The challenge—how can designers support high-end features such as connectivity and media playback without charging high-end prices? The i.MX25 family of processors offers integration that tailors itself to the connectivity requirements of today's automobile but eliminates expensive parts not needed for a cost-conscious infotainment system. Starting with a 400 MHz ARM® ARM926EJ-S™, the system has plenty of processing muscle to decode today's media codecs including MP3, AAC and WMA. The part has an integrated memory controller with cost-saving features such as DDR2 and NAND flash support.

Complementing the core are an integrated USB host and USB OTG port that allow direct connection to media players, with an integrated PHY to reduce system cost. Bluetooth can be connected using one of the USBs, one of the five UARTs or through one of the two SSI interfaces that support I<sup>2</sup>S input/output. The i.MX25 family can support audio output through two integrated SSI/I<sup>2</sup>S ports. The part integrates an enhanced audio interface (ESAI), allowing multi-channel output. Through this interface, the audio can be professionally tuned for speaker size and

cabin placement in different car models.

The i.MX25 family helps automobile designers implement a value-oriented infotainment system in one package. This processor family includes two integrated CAN bus interfaces for direct connectivity to the automobile electronics, three 12-bit ADCs that can be used for implementing the physical interface and an integrated CMOS sensor interface and LCD controller. The i.MX251 processor eliminates LCD support and the CMOS sensor, and is an ideal choice for lower-cost systems.

Comprehensive board support packages (BSPs) for the Microsoft® Windows® Embedded CE and Linux® operating systems are available to download at no cost\* at [www.freescale.com](http://www.freescale.com). The QNX® Neutrino® operating system and Aviage multimedia suite are also supported through QNX.

*\*Upon acceptance of the Freescale Software License Agreement*

### Features

#### Automotive Grade

- AEC-Q100 grade 3 qualification
- Designed for -40 °C to +85 °C ambient temperature operating conditions
- Architected and tested for Zero Defects objectives
- 90 nm CMOS process and 0.8 mm pitch MAPBGA

#### CPU/Memory

- ARM926EJ-S runs at up to 400 MHz for audio codec support, Bluetooth stack processing and command driver speech recognition
- Integrated 16 KB data cache and 16 KB instruction cache
- Integrated memory management unit

- Memory interface supports:
  - DDR2, mDDR and SDRAM memory
  - NOR and NAND flash

#### Multimedia

- CMOS/CCD sensor interface for rear-view camera or video input
- LCD controller (i.MX255) for up to (800x600) SVGA resolution at 16 bpp
- Audio interfaces: 2 x SSI/I<sup>2</sup>S ports, Enhanced Serial Audio Interface (ESAI) for support of 5.1 speaker systems or multi-speaker outputs
- MMC/SD/SDIO enables internal or external connectivity through standard interface

#### Connectivity

- High-speed USB OTG with integrated high-speed PHY
- High-speed USB host with integrated full-speed PHY or high-speed operation through ULPI interface
- 2 x FlexCAN modules
- 10/100 Ethernet MAC
- 5 x UART
- 3 x configurable serial peripheral interfaces (CSPI)
- 3 x I<sup>2</sup>C interface
- 3.3 V general purpose I/O

#### Software

- Windows Embedded CE 6.0
- Linux
  - Automotive Grade Linux (available Q3 09)
  - TRIO multimedia framework for Linux
- QNX (available through QNX)
- Audio codecs
  - AAC
  - MP3
  - WMA



## Product Development Kit

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

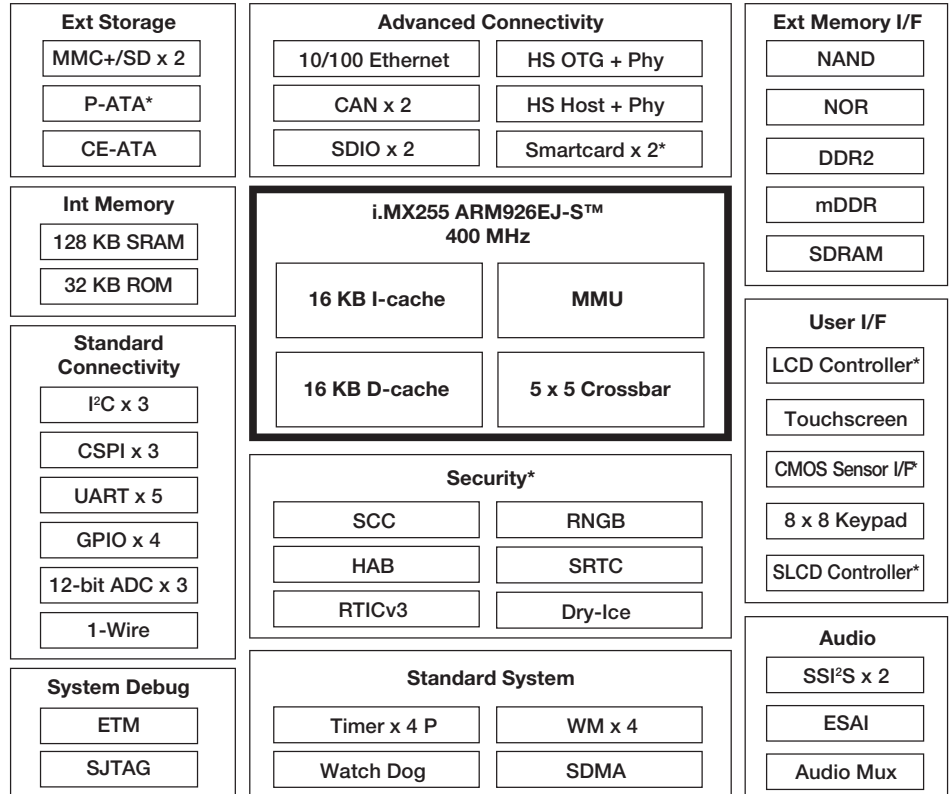
## Freescale Connect Partner Program

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 and support and training. For more information, visit [freescale.com/alliances](http://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 [freescale.com/iMX](http://freescale.com/iMX).

## i.MX255 Applications Processor



\* indicates that this feature is not available on the i.MX251

For more information, visit [freescale.com/iMX](http://freescale.com/iMX)



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