

# Freescale i.MX31 Product Development Kit

## Design. Debug. Demo.

### Overview

Do you want to design a product that requires vivid images and pictures, sharp video, music with clarity, detailed navigation information and maps that are precise and fast? Do you have a tight development schedule? Market demands are always increasing. To break through the clutter, your product must have the performance, simplicity and elegant design that sets new standards.

If this is your environment, you need a development platform with an integrated hardware engine and robust software.

Design engineers who want to focus on what makes their product unique in the market—and spend only the time necessary to develop the application's features—need look no further than Freescale Semiconductor.

Freescale's comprehensive "form-factor" development kit is built on the powerful ARM 1136™ based i.MX31 applications processor with SmartSpeed™ technology. It delivers a high-performance, low-power, cost-effective solution for a variety of solutions, including devices that require robust 3-D graphics and excellent video performance.

The i.MX31 PDK is preconfigured with your choice of Linux® or Windows® CE 5.0 (Windows Embedded CE 6.0 is on an accompanying CD), making it suitable for a wider range of multimedia applications.

### Design.

With the i.MX31 PDK, you can access more key features. Many core hardware and software elements are included, saving development time and expense. The Freescale i.MX31 PDK's personality module provides the designer with key hardware functionality and connectivity required for many consumer, health care

and industrial applications, such as personal navigation devices (PNDs), personal media players (PMPs), medical/industrial monitoring systems and touch-screen devices, saving time in the design and debugging of the device.

With production-ready software components, an optimized OS, a system-validated board support package (BSP) and Freescale's high-performance multimedia codecs, designers have the tools to test and maximize the performance of the applications they have developed.

### Debug.

Software and hardware engineers are provided with the key resources to test their developed code. They can also download this code to the target PDK to test and validate their software and run and evaluate performance metrics where needed. The ability to have all communications ports working (serial, USB, Ethernet) and to debug over JTAG is essential for product development. For example, the USB and the SD card can be used to run video tests from USB and from SD, or designers can reformat the SD card and use it as a disk.

### Demo.

Finish strong! Demonstrate the results of your development efforts in the small form factor provided, and evoke confidence that

your product is ready to go into production. The competition is fierce, and this feature will give your management team confidence that your product is ready. Get your project approved and into production quickly. With Freescale's i.MX31 PDK, key stakeholders can hold the product in their hands and evaluate the compelling features of your design.



### Key Features

#### i.MX31 Processor Module

- CPU engine: ARM 1136, 532 MHz
- Core voltage: 1.2–1.47V Auto
- High-performance ARM11® platform with VPU and embedded L2 cache
- Excellent connectivity options
  - 3 x USB
  - ATA-6 interface for HDD and CD/DVD
  - 256 MB NAND Flash
  - 128 MB SDRAM
- Robust multimedia including MPEG-4 hardware encoder
- Low power <500 mW
- High-performance display
  - Embedded 3-D graphics
  - Hardware resizing, inversion, rotation
  - Hardware color space conversion
  - Video/graphics combining



- Power management (PMIC MC13783) + power circuitry
- Audio
- HS USB PHY
- Touch controller
- Connector

#### Personality Module

- Accelerometer MMA7450L (Freescale)
- User I/O
- Connectivity (FM, 802.11, Bluetooth®, USB OTG, USB HS)
- Navigation buttons and keypad
- 2.7" TFT touch screen display
- 2 MP camera module
- SDcard, ATA HDD
- External connectors (dock, headphones, TV-out, GPS)
- Speaker
- Input/output jack

#### Software Development Debug Module

- Debug Ethernet port
- Debug serial port
- JTAG
- Reset, interrupt, boot switches
- Debug LEDs
- CodeTest interface
- Power source
- Current/power monitoring

#### Software Development Kit

- Optimized and validated for Linux, or Windows CE 5.0, or Windows Embedded CE 6.0 environments
- Integrated and validated BSP and additional drivers for personality module
- Middleware, GStreamer or Windows CE framework, multimedia codecs, connectivity protocol stacks, wireless applications and power management
- Functional software packages with production-ready components that have been developed by Freescale
- Highly optimized software that is coded by Freescale processor experts
- Free implementation of popular multimedia algorithms
- Consistent application programming interface (API) and frameworks across all software packages
- Evaluation and production software packages available through a streamlined, Web-based licensing and delivery system
- Freescale development tools, test streams and documentation

#### Key Benefits

- Up to VGA 30 fps video quality
- Superior image quality
- Industry-leading power management offers an abundance of different power saving modes, giving the system developer the ability to make trade-offs between

power consumption in stand-by and recovery times

- Rich multimedia experience; exceeds the performance of higher MHz processors
- Reduced hassle associated with design-in of key connectivity options
- Simplified product design

#### The i.MX31 Applications Processor

- CPU complex with ARM1136JF-S core, L2 cache, vector floating point co-processor and Smart Speed™ switch
- Smart power management, including support for multiple low power modes, dynamic voltage frequency scaling, and dynamic process temperature compensation
- External memory interface with support for SDRAM, mobile DDR, NAND flash, and PSRAM
- Smart multimedia with support for hardware-accelerated MPEG4 encode, as pre- and post-processing
- Display port with ability to support a variety of popular displays
- Sensor port that provides connection to either one or two image sensors
- System connectivity, including USB high speed OTG, CSPIs, I<sup>2</sup>C, PCMCIA, ATA, UARTs
- Graphics acceleration

## Freescale Multimedia Codecs

Freescale's high-performance multimedia codecs enable a series of popular audio, video and image applications for the i.MX31 applications processor. The multimedia codecs are provided as fully functional software packages to support various use cases, such as audio/video playback, audio/video record or image capture/display. There are two types of codec software packages available for the i.MX31 applications processor.

- Standard Codec Software Packages consist of software codecs and enabling software.
- VPU Codec Software Packages consist of enabling software to support the hardware-accelerated codecs that reside on the processor.

#### Learn More:

For current information about Freescale products and documentation, please visit [www.freescale.com](http://www.freescale.com).