Enabling high-end graphics for secure and connected applications

i.MX 6Dual, i.MX 6DualPlus, i.MX 6Quad, i.MX 6QuadPlus Applications Processors

Broadening the high-end of the i.MX 6 series, the i.MX 6Dual, i.MX 6DualPlus, i.MX 6Quad and i.MX 6QuadPlus are highly integrated multi-market applications processors based on ARM® Cortex®-A9 architecture.

TARGET APPLICATIONS

‣ Infotainment

‣ Instrument clusters

‣ Aerospace and defense

‣ Digital signage

‣ Medical/healthcare

‣ Home entertainment and accessories

‣ Media streaming

‣ HMI (industrial, building control)

These application processors are designed to enable secure, high-performance and visually stunning solutions. Targeting consumer, industrial and automotive applications, the processors combine broad levels of integration and power-efficient processing capabilities all the way up to bleeding-edge 2D and 3D graphics, as well as high-definition video, to provide a new level of multimedia performance for an unbounded next-generation user experience. These four applications processors are supported by companion power management ICs (PMICs) PF0100 and PF0200.

FEATURES

‣ The i.MX 6Quad and the i.MX 6Dual processors offer dedicated graphics engines to provide the ultimate video experience: OpenGL® ES 2.0 3D graphics accelerator with four shaders, 2D graphics accelerator and dedicated OpenVG 1.1 accelerator. The use of hardware accelerators is a key factor in obtaining high performance at low power consumption numbers while keeping the CPU core relatively free to perform other tasks.

‣ For applications that require higher graphics performance, the i.MX 6QuadPlus and the i.MX 6DualPlus offer enhanced graphics of more than 50% performance increase along with increased embedded SRAM and a prefetch and resolve engine to improve efficiency.

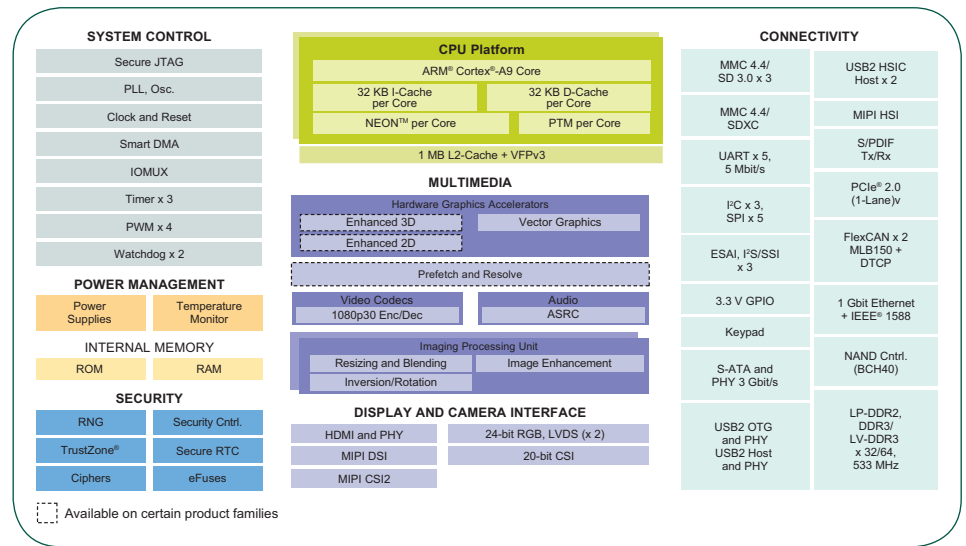‣ Each processor provides an optimized 64-bit DDR3/LVDDR3/LPDDR2-1066 memory interface to increase bus bandwidth.

- The i.MX 6 series cores deliver hardware-enabled security features such as TrustZone® architecture and High Assurance Boot (HAB) that enable secure e-commerce, digital rights management information encryption, secure boot and secure software downloads.

- Interfaces necessary for connecting peripherals such as WLAN, Bluetooth™, GPS, camera sensors, SATA II and multiple displays are included to fulfill the requirements of the target applications.

i.MX 6DUAL, i.MX 6DUALPLUS, i.MX 6QUAD, i.MX 6QUADPLUS BLOCK DIAGRAM

SYSTEM CONTROL
Secure JTAG | PLL, Osc. | Clock and Reset | Smart DMA | IOMUX | Timer x 3 | PWM x 4 | Watchdog x 2

POWER MANAGEMENT
Power Supplies | Temperature Monitor

INTERNAL MEMORY
ROM | RAM

SECURITY
RNG | Security Cntrl. | TrustZone® | Secure RTC | Ciphers | eFuses

CPU Platform
ARM® Cortex®-A9 Core
32 KB I-Cache per Core | 32 KB D-Cache per Core
NEON™ per Core | PTM per Core
1 MB L2-Cache + VFPv3

MULTIMEDIA
Hardware Graphics Accelerators
Enhanced 3D | Vector Graphics
Enhanced 2D
Prefetch and Resolve
Video Codecs 1080p30 Enc/Dec | Audio ASRC
Imaging Processing Unit
Resizing and Blending | Image Enhancement
Inversion/Rotation

DISPLAY AND CAMERA INTERFACE
HDMI and PHY | 24-bit RGB, LVDS (x 2)
MIPI DSI | 20-bit CSI
MIPI CSI2

CONNECTIVITY
MMC 4.4/ SD 3.0 x 3 | USB2 HSIC Host x 2
MMC 4.4/ SDXC | MIPI HSI
UART x 5, 5 Mbit/s | S/PDIF Tx/Rx
I²C x 3, SPI x 5 | PCIe® 2.0 (1-Lane)v
ESAI, I²S/SSI x 3 | FlexCAN x 2 MLB150 + DTCP
3.3 V GPIO | 1 Gbit Ethernet + IEEE® 1588
Keypad | NAND Cntrl. (BCH40)
S-ATA and PHY 3 Gbit/s | LP-DDR2, DDR3/ LV-DDR3 x 32/64, 533 MHz
USB2 OTG and PHY USB2 Host and PHY

☐ Available on certain product families

PACKAGE TECHNOLOGY

The 21 mm x 21 mm packages for the i.MX 6Dual and i.MX 6Quad enable customers to meet needs in all qualification tiers across consumer, industrial and automotive standards. The i.MX 6Dual and i.MX 6Quad Package on Package (PoP) 12 mm x 12 mm option helps customers who are space constrained to design in a smaller package. And the 21 mm x 21 mm packages for the i.MX 6DualPlus and i.MX 6QuadPlus are not only qualified for consumer, industrial, and automotive standards, but also help customers who need additional graphics performance for optimal visualization.

The i.MX 6DualPlus and i.MX 6QuadPlus processors provide multiple compatible and scalable options to choose from.

SOFTWARE AND TOOLS

The i.MX 6Dual, i.MX 6DualPlus, i.MX 6Quad and i.MX 6QuadPlus processors are supported by the SABRE board for smart devices and come with an SD card pre-installed with the Linux® operating system. Android™ OS is also available.

i.MX 6 SERIES ECOSYSTEM

Leveraging the broad ARM community, the i.MX 6 series builds technology alliances to enable better customer solutions and faster time-to-market. Partner solutions include:

- Tool chains
- Software
- Codecs
- Middleware/ applications
- Embedded board solutions
- Design services
- System integrators
- Training

i.MX 6DUAL, i.MX 6DUALPLUS, i.MX 6QUAD, i.MX 6QUADPLUS DEVICE OPTIONS

	Consumer Extended Devices				Industrial Devices				Automotive Devices			
Temperature Range	-20°C to 105°C				-40°C to +105°C				-40°C to +125°C			
Maximum ARM® Cortex®-A9 Core Clock Speed	1.2 GHz^				800 MHz				852 MHz, 1 GHz			
Other Features	1x GbE, CAN Parallel LCD, SATA II				1x GbE, CAN Parallel LCD, SATA II				1x GbE, CAN, MLB Parallel LCD			
Options	VPU, GPU				VPU, GPU				VPU, GPU			
Package	21 x 21 0.8 mm pitch 624-ball 12 x 12 PoP 569-ball*				21 x 21 0.8 mm pitch 624-ball 12 x 12 PoP 569-ball*				21 x 21 0.8 mm pitch 624-ball			
Ethernet	1 x 1 Gbit/s				1 x 1 Gbit/s				1 x 1 Gbit/s			
FlexCAN	Yes				Yes				Yes			
PCIe®	Yes				Yes				Yes			
Connectivity	USB 2.0 OTG	PHY x 2	I²C	SSI/ESSI	USB 2.0 OTG	PHY x 2	I²C	SSI/ESSI	USB 2.0 OTG	PHY x 2	I²C	SSI/ESSI
MIPI	Yes				Yes				Yes			

^ 1.0 GHz available. Contact NXP for 1.2 GHz availability.
* i.MX 6Dual and i.MX 6Quad only

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Product Longevity

Energy Efficient Solutions by Freescale