



Transforming interactions in ways you've never imagined

i.MX 8 Family of Applications Processors

Built with advanced media processing, secure domain partitioning and innovative vision processing, the i.MX 8 applications processor family will revolutionize multiple display automotive applications, industrial systems, vision, HMI and single-board computers.

TARGET APPLICATIONS

- ▶ Automotive infotainment—instrument cluster, head unit, heads-up display (HUD), rear seat entertainment and full digital electronic cockpit (eCockpit)
- ▶ Advanced industrial human machine interface (HMI) and control
- ▶ Single-board computers
- ▶ Home/Building

MULTIPLE SYSTEMS, ONE PROCESSOR

- ▶ **Easily combine multiple systems into one**
Build multiple platforms with multiple operating systems on a single i.MX 8 processor. The i.MX 8 full-chip hardware-based virtualization, system MMU, resource partitioning and split GPU and display architecture enable faster time-to-market and lower cost than simple hypervisor techniques alone.
- ▶ **Secure Your system with SECO HSM**
Top-of-the-line security via the SECO (security controller) with an isolated, dedicated hardware security module (HSM) to protect the system and its connections.
- ▶ **Isolate key systems with on-chip hardware firewalls**
Isolate critical services such as over-the-air (OTA) upgrades by running within 16 separate run-time programmable hardware firewall domains.
- ▶ **Improve your system reliability with FDSOI**
Built using 28 nm FDSOI, the i.MX 8 applications processor enables improved MTBF and decreases soft error rates due to FDSOI's inherently high immunity to alpha particle flux.

THE NEW USER INTERACTION PARADIGM

- ▶ **Create advanced vision-based HMI systems**
High-performance end-to-end vision processing for vision-based assistance, tracking and object detection.
- ▶ **360-degree expanded sight**
Utilize multi-camera input, digital stitching and VX vision extensions and provide a view from any angle.
- ▶ **Multi-domain voice recognition**
Utilize the Arm® Cortex®-A72, Cortex-A53, and Cortex-M4F cores as well as the HiFi 4 DSP* for advanced echo cancellation, keyword detection and speech recognition for hands-off interaction.

MULTI-DISPLAY & MULTI-DOMAIN FUNCTIONALITY

- ▶ **Four screens of independent content**
Develop innovative, multi-screen platforms through the ability to drive up to four 1080p screens with independent content (or a single 4K screen).
- ▶ **Ensure your display stays up and correct**
SafeAssure® program qualified, ASIL B ready hardware protects critical visual information with fail-over-capable quality of service to any display.
- ▶ **Offload time-critical tasks**
Utilize dual Cortex-M4F cores for time-critical tasks such as backup camera display, audio control and general system monitoring and wakeup.



THE SCALABLE PLATFORM OF CHOICE

► Comprehensive software support

Android™, Linux®, QNX, Green Hills®, DornerWorks XEN and FreeRTOS™

► Automotive, industrial, consumer qualified

Auto (-40 °C to 125 °C Tj), industrial (-40 °C to 105 °C Tj)

PIN AND POWER COMPATIBLE

Highly scalable design options allow a single platform to cover multiple products. Pin- and power-compatible package (in 0.75 pitch) allow a single PCB platform and utilize different i.MX 8 processors as product needs dictate.*

EARLY DEVELOPMENT ACCESS

The i.MX 8 multi-sensory evaluation kit (MEK) is available now to prototype i.MX 8 systems. Contact your NXP sales representative for details.

i.MX 8 FAMILY—DIFFERENTIATED FEATURES

Feature	i.MX 8QuadMax	i.MX 8QuadPlus
Arm® Core	2 x Arm Cortex®-A72	1 x Cortex-A72
Arm Core	4 x Cortex-A53	4 x Cortex-A53
Arm Core	2 x Cortex-M4F	2 x Cortex-M4F
DSP Core	HiFi 4 DSP	HiFi 4 DSP
GPU	2 x GC7000XSVX	2 x GC7000Lite/XSVX
PCIe® 3.0	1 x PCIe (2-lane)*	1 x PCIe (1-lane)

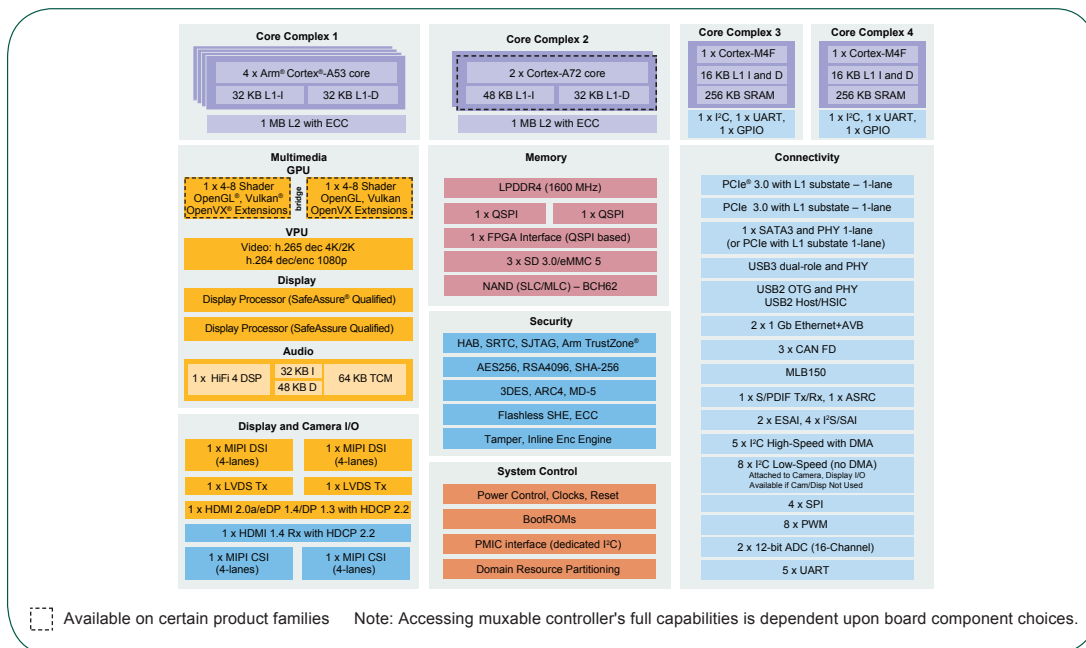
*2-lane PCIe can act as 2 x 1-lane PCIe

i.MX 8 FAMILY—COMMON FEATURES

Feature	Description	Feature	Description
DRAM	64-bit LPDDR4	QuadSPI	2 x QuadSPI (1 x OctoSPI)
VPU	4K h.264 encode, decode	USB with PHY	1 x USB 3.0, 2 x USB 2.0
Display controller	2 x DCs with WARP and failover	SPDIF Tx/Rx	1 x
MIPI DSI	2 x 4-lane MIPI DSI	SD and eMMC	3 x SD 3.0/eMMC 5.0
MIPI CSI	2 x 4-lane MIPI CSI	NAND	1 x – BCH62
LVDS	2 x LVDS	FPGA Interface	Yes - 4 x data lane, 1 x Clock
HDMI, eDP, DP Tx	1 x HDMI 2.0a/eDP 1.4/DP 1.3 HDCP 2.2	I²C	5 x I²C (high speed) + 8 x I²C (low speed)
HDMI Rx	1 x HDMI 1.4 Rx HDCP 2.2	SPI	4 x SPI
SATA 3.0	1 x SATA 3.0 (1-lane) or PCIe (1-lane)*	Audio Interfaces	2 x ESAI, 5 x I²S/SAI
Security	SECO hardware security module (HSM), flashless SHE, inline DDR encryption, hardware domain firewalls	Keypad	1 x
CAN	3 x CAN FD	MPEG-2 T/S	2 x MPEG-2 T/S
MLB	1 x MLB 150/MLB25	ADC	2 x 12-bit (16 channels each)
Ethernet	2 x Gigabit Ethernet with AVB	UART	5 x UART 1 x UART per Arm® Cortex®-M4F

*The SATA 3.0 controller can be used as PCIe (1-lane). This is in addition to the other PCIe controllers. Note: Accessing muxable controller's full capabilities is dependent upon board component choices.

i.MX 8 FAMILY BLOCK DIAGRAM



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