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.
- **Securely change hardware partitions at run time**
  Applications can 'sand-box' operations by moving hardware IP such as GPU, display or peripherals to multiple firewalled domains at run time.
- **Secure your system with advanced programmable security**
  Top-of-the-line security from first boot to securing with the latest cryptography standards (AES, flashless SHE, elliptical curve cryptography, key storage).
- **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 and Cortex-M4F cores as well as the HiFi 4 DSP* for advanced echo cancellation, key word 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® 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), consumer (-20 °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 packages (in 0.75 and 0.65 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 and i.MX 8X systems. Contact your NXP sales representative for details.

i.MX 8 FAMILY—DIFFERENTIATED FEATURES

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

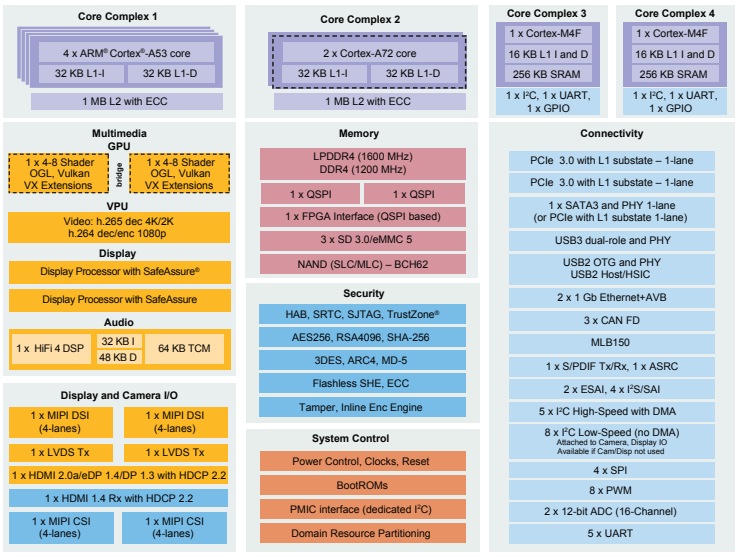
*2-lane PCIe can act as 2 x 1-lane PCIe

i.MX 8 FAMILY—COMMON FEATURES

Feature	Description	Feature	Description
DRAM	64-bit LPDDR4/ DDR4	QuadSPI	2 x QuadSPI (1 x OctoSPI)
VPU	4K h.265 dec, HD h.264 enc	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	HAB, DPA, enc/ dec, flashless SHE inline DDR encryption, 4 tamper pins	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



Available on certain product families Note: Accessing muxable controller's full capabilities is dependent upon board component choices.

www.nxp.com/iMX8

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