



Transforming interactions in ways you've never imagined

# i.MX 8M Mini Applications Processor

The i.MX 8M Mini applications processor blends advanced processing capabilities with sophisticated audio, video, and graphics to deliver low-power and high-performing solutions for embedded consumer and industrial applications.

## TARGET APPLICATIONS

- ▶ General purpose human machine interface (HMI) solutions enabling touch, voice, graphics, video, image analytics and vision
- ▶ Streaming video devices – two-way video conferencing, video doorbell and surveillance, digital signage, machine visual inspection
- ▶ Streaming audio devices – surround sound, wireless or networked speakers, soundbars, audio/video (AV) receivers, public address systems
- ▶ Voice control and voice assistants, with reference designs for homes or noisy industrial environments

## PERFORMANCE AND VERSATILITY

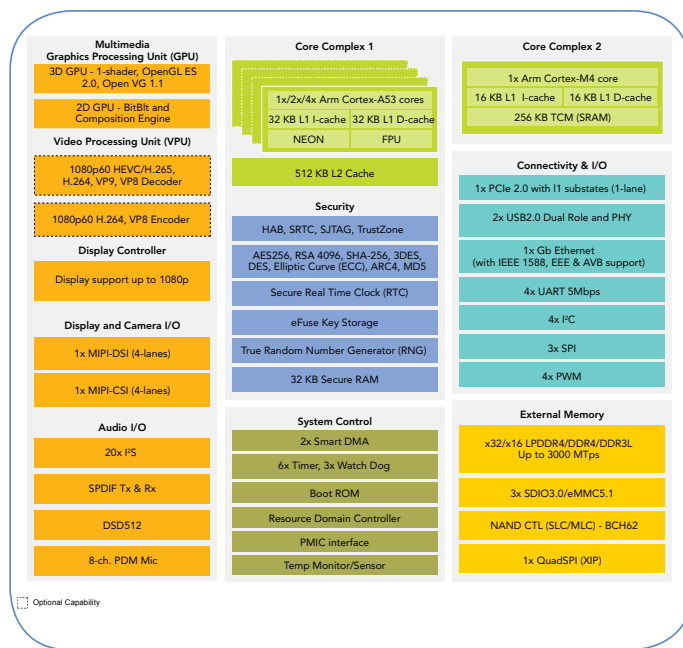
- ▶ **Scalable single-, dual- or quad- Arm® Cortex®-A53 and Cortex-M4 cores for Heterogeneous Multicore Processing (HMP)**

- Arm Cortex-A53 runs up to 1.8 GHz per core, delivering outstanding system performance
- Delivered in advanced low-power process, the core complex is optimized for fanless operation, low thermal system cost and long battery life. The Cortex-A cores can be powered off while the Cortex-M4 subsystem performs low power, real time system monitoring.

- ▶ **Flexible memory options to address system needs**

- Offers high-speed LPDDR4 memory interface for the highest performance and lowest standby power, or DDR4 and DDR3L interfaces for lowest system cost

## i.MX 8M MINI BLOCK DIAGRAM



### ▶ All the high-speed interfaces you need for flexible connectivity

- Two USB 2.0 interfaces with PHY
- Three SDIO interfaces provides boot source, expandable storage, and connectivity options
- PCIe interface with L1 substates for fast wakeup and low power
- MIPI-DSI (4-lane) display interface
- MIPI-CSI (4-lane) camera interface
- Gigabit Ethernet MAC with Audio Video Bridging (AVB) and IEEE capability

### ADVANCED VIDEO AND AUDIO FOR MEDIA IOT DEVICES

#### ▶ Full duplex 1080p video

- Independent hardware video encode and decode engines deliver low-power, high-quality 1080p video for a variety of video-enabled applications such as video calling, monitoring and streaming. Supports latest standards such as HEVC (H.265\*) and VP9\* and H.264 and VP8.

#### ▶ Pro-level audio for embedded applications

- Up to 20 audio channels enabled on a price-competitive embedded applications processor. It brings DSD512 and TDM audio and a game-changing selection of advanced audio streaming interfaces into the next generation of connected speakers, soundbars and AV receivers. Bring pro-level audio to your embedded consumer or industrial design.

\* H.265 and VP9 video decode only.

### THE NEW HMI: VIDEO, VOICE, MACHINE VISION, AI

#### ▶ Rich display with video capabilities

- Up to 1080p60 resolution on the MIPI-DSI (4-lanes) interface with independent 2D and 3D GPU engines work effectively and efficiently to enable high quality visual user experience.
- Playback the latest video standards up to 1080p resolution using H.264, H.265 and VP9 (for YouTube) codecs, using low-power hardware acceleration.

#### ▶ Bring voice control to the edge

- Your design can leverage the latest voice control capabilities. Software solutions support reliable voice control in noisy environment without a DSP.

#### ▶ Machine vision

- The MIPI-CSI interface allows you to connect a camera and perform imaging based inspection of products and services. This can enable data collection for analysis, learning and automation of commercial or industrial systems.

### i.MX 8M MINI—DIFFERENTIATED FEATURES

Feature	i.MX 8M Mini	i.MX 8M Mini Lite
Arm Core	1x or 2x or 4x Cortex-A53	
Arm Core	1x Cortex-M4F	
DDR Interface	x32 LPDDR4/DDR4/DDR3L	
Audio	20x I <sup>2</sup> S, 32-bit up to 384KHz with DSD512 and TDM support, 8-ch PDM microphone inputs	
GPU	2D and 3D Graphics	
Video Decode Acceleration	1080p60 H.265, H.264, VP8, VP9	n/a
Video Encode Acceleration	1080p60 H.264, VP8	n/a
Display	1x MIPI-DSI	1x MIPI-DSI
Camera	1x MIPI-CSI	1x MIPI-CSI
Connectivity	1x PCIe 2.0, 3x SDIO/eMMC, 2x USB 2.0, 1x GbE	

### SYSTEM SCALABILITY AND DESIGN FOR OPTIMIZATION

#### ▶ Pin compatible package options provide design flexibility

- Scale up and down the product line-up through a pin-compatible package option that enables you to future-proof your design. Design your single PCB platform with build options that use different i.MX 8M Mini applications processors to meet your product needs.
- Build options include choice of quad-, dual-, or single-core Cortex-A53 processors, Cortex-A53 operating frequency, and 1080p video performance.

#### ▶ Expert package design enable system design simplification

- Our expert engineers have defined package options that simplify your hardware design and provide overall system cost benefit depending on the application. Reference hardware designs are available to help get you started fast.

#### ▶ Comprehensive software support

- Android™, Linux®, FreeRTOS and partner commercial operating systems. Benefit from extensive years of BSP development on i.MX applications processors from NXP and its partners.

#### ▶ Industrial and consumer qualified

- Industrial (-40 °C to 105 °C T<sub>j</sub>) device options to support always-on applications operating in harsh environments. For more cost-sensitive, higher-performing applications, consumer device options are available (0 °C to 95 °C T<sub>j</sub>, faster core operating speeds).

### GET STARTED NOW

The i.MX 8M Mini silicon is available for your next design. Get started now with EVKs, samples, software and documentation. Available today at [www.nxp.com/iMX8Mmini](http://www.nxp.com/iMX8Mmini).

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