The i.MX 8M Nano family of applications processors provide affordable performance for smart, connected, power-efficient devices requiring graphics, vision, voice control, intelligent sensing and general-purpose processing.

**SCALABLE, VERSATILE, AFFORDABLE**

**Design once, scale your performance**

- Quad-, dual- or single-core Arm® Cortex®-A53 offerings enables scalable processing in a pin-compatible package.
- Optional 3D GPU for applications requiring higher levels of graphics performance (HMI).
- Cortex-M7 for heterogenous multicore processing to enable MCU-like functions or low-power processing.
- Pin-compatible package enables you to build one hardware design that supports both the i.MX 8M Nano and i.MX 8M Mini applications processors; add performance and features as your product requires.

**Versatile, optimized system design**

- NXP built and proven reference designs are available in a size-optimed form, enabled with latest software, and accessible on nxp.com to help get you started, fast.
- System designs offer high-speed LPDDR4 memory for optimized performance and power, or DDR4 and DDR3L memory for optimized system cost.

**Power efficiency**

- Delivered advanced 14LPC FinFET process, the device is optimized for high performance operation and low thermal system cost. The Cortex-A cores can be powered off while the Cortex-M7 subsystem performs low-power, real-time system monitoring.

**Longevity of supply**

- Backed by NXP’s product longevity program to ensure a stable supply of product for your embedded design.
FACT SHEET  i.MX 8M NANO FAMILY

HIGH-PERFORMANCE COMPUTE
- 1x, 2x or 4x Arm Cortex-A53 cores running at speeds up to 1.5 GHz per core
- 1x Arm Cortex-M7 running at speeds up to 750 MHz, enables heterogenous multicore processing
- Resource domain controller enables secure allocation of resources to either Cortex-A53 or Cortex-M7 cores

SYSTEM CONNECTIVITY
- *MIPI-DSI (4-lanes) for display
- MIPI-CSI (4-lanes) for camera input
- Multiple SDIO interfaces to enable flexibility in supporting boot, expansion and connectivity (Wi-Fi®)
- Gigabit Ethernet (with IEEE® 1588, EEE and AVB support) and USB 2.0

GRAPHICS FOR HMI
- *3D GPU with OpenGL® ES 3.1 and Vulkan® support enables graphical UI (e.g. Android™)
- *MIPI-DSI enables single display output for human machine interface

ADVANCED AUDIO PROCESSING
- Supports at least 20 channels of high-fidelity audio playback
  - 10Tx + 10Rx external I²S lanes
  - 8-channel PDM DMIC support
  - Hardware asynchronous sample rate conversion (ASRC)

INTELLIGENCE AT THE EDGE
- Depending on the performance needs and complexity of your neural network, run your optimized model on either the Cortex-A53, Cortex-M7 or general purpose GPU (supports OpenCL™ 1.2)
  - Use NXP’s extensive eIQ™ software suite to help realize and implement your machine learning needs
- Leverage the latest voice control solutions that support reliable voice control in noisy environments without using a DSP

SYSTEM DESIGN OPTIMIZATION
Pin-compatible package options provide design flexibility
- 14 x 14 0.5 mm and 11 x 11 0.5 mm packages designed for maximum frequency enablement with 6 layer board design and no microvias
- Pin compatibility with the i.MX 8M Mini provides drop-in scalable product performance
- 8-channel DMIC support for direct connection of PDM microphones (no CODEC) enables system cost savings
Leverage NXP’s system design expertise
• 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 using different memory types are available to help get you started fast
• Comprehensive software support

PIN COMPATIBLE i.MX 8M MINI AND NANO - DIFFERENTIATED FEATURES

<table>
<thead>
<tr>
<th></th>
<th>i.MX 8M Mini</th>
<th>i.MX 8M Nano</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Arm Core</td>
<td>1 x or 2 x or 4 x Cortex®-A53 up to 1.8 GHz</td>
<td>1 x or 2 x or 4 x Cortex-A53 up to 1.5 GHz</td>
</tr>
<tr>
<td>Secondary Arm Core</td>
<td>1 x Cortex-M4F up to 400 MHz</td>
<td>1 x Cortex-M7 up to 750 MHz</td>
</tr>
<tr>
<td>DDR Interface</td>
<td>x16/x32 LPDDR4/DDR4/DDR3L</td>
<td>x16 LPDDR4/DDR4/DDR3L</td>
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<tr>
<td>Audio</td>
<td>5 x SAI (12Tx + 16Rx external I²S lanes) up to 49.152 MHz BCLK; DSD512</td>
<td>5 x SAI (10Tx + 10Rx external I²S lanes) up to 49.152 MHz BCLK; DSD512; ASRC</td>
</tr>
<tr>
<td>GPU</td>
<td>2D GPU, 3D GPU (1x shader, OpenGL® ES 2.0)</td>
<td>3D GPU (2x shader, OpenGL® ES 3.1, OpenCL 1.2, Vulkan)</td>
</tr>
<tr>
<td>Video Decode Acceleration</td>
<td>1080p60 H.265, H.264, VP8, VP9</td>
<td>None</td>
</tr>
<tr>
<td>Video Encode Acceleration</td>
<td>1080p60 H.264, VP8</td>
<td>None</td>
</tr>
<tr>
<td>Display</td>
<td>1 x MIPI-DSI</td>
<td>1 x MIPI-DSI</td>
</tr>
<tr>
<td>Camera</td>
<td>1 x MIPI-CSI</td>
<td>1 x MIPI-CSI</td>
</tr>
<tr>
<td>Connectivity</td>
<td>1 x PCIe 2.0, 3 x SDIO/eMMC, 2 x USB 2.0, 1 x GbE</td>
<td>3 x SDIO/EMMC, 1 x USB 2.0, 1 x GbE</td>
</tr>
</tbody>
</table>

*Android, Linux and FreeRTOS® developed, tested and supported by NXP and partner commercial operating systems (Voice, ML, audio framework). Benefit from extensive years of BSP development on i.MX applications processors from NXP and its partners.
- eIQ™ software suite
- Windows 10 IoT Core
- Third party voice and UI solutions
- Pins tool for i.MX application processors
- Benefit from the extensive i.MX software ecosystem
- Industrial and consumer qualified

Industrial (-40 ºC to 105 ºC Tj) device options support always-on applications operating in harsh environments
For more cost-sensitive, higher-performing applications, consumer device options (0 ºC to 95 ºC Tj) and faster core speeds are available
*Features not available on the i.MX 8M Nano UltraLite