## Power-efficient, cost-optimized products

# i.MX 6ULL Applications Processors

The high-performance and ultra-efficient i.MX 6ULL processor family features an advanced implementation of a single Arm® Cortex®-A7 core that operates at speeds up to 900 MHz.

### TARGET APPLICATIONS

‣ Human-machine interface (HMI)

‣ IoT gateways

‣ Home energy management systems

‣ Smart energy concentrators

‣ Intelligent industrial control systems

‣ Portable medical

‣ Streaming audio

‣ Printers and 2D scanners

‣ Smart appliances

‣ Low-end e-Reader

The i.MX 6ULL applications processor includes an integrated power management module that reduces the complexity of an external power supply and simplifies power sequencing. Each processor in this family provides various memory interfaces, including 16-bit LPDDR2, DDR3, DDR3L, raw and managed NAND flash, NOR flash, eMMC, Quad SPI and a wide range of other interfaces for connecting peripherals such as WLAN, Bluetooth®, GPS, displays and camera sensors. The i.MX 6ULL is supported by discrete component power circuitry.

### i.MX 6ULL FEATURES

‣ Single Arm Cortex-A7 core can provide a more cost-effective and power-efficient solution

‣ Flexible boot options, including support for Quad SPI and raw NAND, and a memory controller that interfaces to both DDR3 and low-power mobile DDR2 memory

‣ Processor supports connections to a variety of interfaces: two high-speed USB on-the-go connections with PHY, multiple expansion card ports (high-speed eMMC/SDIO host and other), two 12-bit ADC modules with up to 10 total input channels, two CAN ports, and a variety of other popular interfaces (such as UART, I²C, and I²S serial audio)
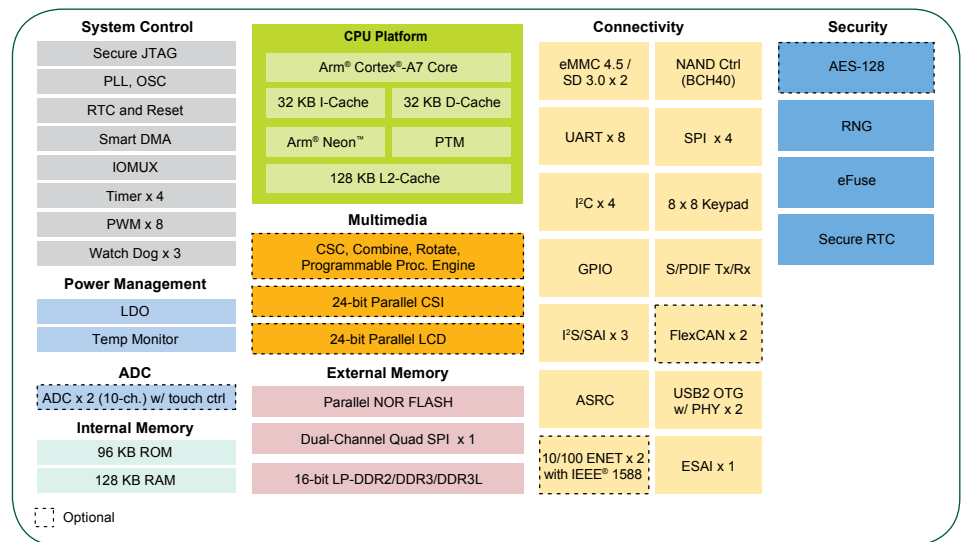
## PACKAGE TECHNOLOGY

The i.MX 6ULL processor provides multiple compatible and scalable package options. The 14 x 14 289 MAPBGA with 0.8 mm pitch brings out all features and GPIO. It is ideal for simple and cost-optimized PCB design. The 9 x 9 272 MAPBGA with 0.5 mm pitch provides smaller form factors than ever before for space-constrained applications.

## SOFTWARE AND TOOLS

The i.MX 6ULL processor is supported by the i.MX 6ULL evaluation kit that includes a CPU module and a base board.

## i.MX 6ULL APPLICATIONS PROCESSOR BLOCK DIAGRAM



**System Control**
- Secure JTAG
- PLL, OSC
- RTC and Reset
- Smart DMA
- IOMUX
- Timer x 4
- PWM x 8
- Watch Dog x 3

**Power Management**
- LDO
- Temp Monitor

**ADC**
- ADC x 2 (10-ch.) w/ touch ctrl

**Internal Memory**
- 96 KB ROM
- 128 KB RAM

**CPU Platform**
- Arm® Cortex®-A7 Core
- 32 KB I-Cache
- 32 KB D-Cache
- Arm® Neon™
- PTM
- 128 KB L2-Cache

**Multimedia**
- CSC, Combine, Rotate, Programmable Proc. Engine
- 24-bit Parallel CSI
- 24-bit Parallel LCD

**External Memory**
- Parallel NOR FLASH
- Dual-Channel Quad SPI x 1
- 16-bit LP-DDR2/DDR3/DDR3L

**Connectivity**
- eMMC 4.5 / SD 3.0 x 2
- NAND Ctrl (BCH40)
- UART x 8
- SPI x 4
- I²C x 4
- 8 x 8 Keypad
- GPIO
- S/PDIF Tx/Rx
- I²S/SAI x 3
- FlexCAN x 2
- ASRC
- USB2 OTG w/ PHY x 2
- 10/100 ENET x 2 with IEEE® 1588
- ESAI x 1

**Security**
- AES-128
- RNG
- eFuse
- Secure RTC

☐ Optional

## i.MX 6ULL DEVICE OPTIONS

• Red indicates change from column to the left

| Feature | MCIMX6Y0 | MCIMX6Y1 | MCIMX6Y2 |
|---|---|---|---|
| Core | Arm® Cortex®-A7 | Arm Cortex-A7 | Arm Cortex-A7 |
| Speed | 528 MHz | 528 MHz | 528, 800, 900 MHz |
| Cache | 32 KB-I, 32 KB-D | 32 KB-I, 32 KB-D 128 KB L2 | 32 KB-I, 32 KB-D 128 KB L2 |
| OCRAM | 128 KB | 128 KB | 128 KB |
| DRAM | 16-bit LP-DDR2, DDR3/DDR3L | 16-bit LP-DDR2, DDR3/DDR3L | 16-bit LP-DDR2, DDR3/DDR3L |
| eFuse for customer | 256-bit | 256-bit | 256-bit |
| NAND (BCH40) | Yes | Yes | Yes |
| Parallel Nor/EBI | Yes | Yes | Yes |
| Ethernet | 10/100 MB x 1 | 10/100 MB x 1 | 10/100 MB x 2 |
| USB with PHY | OTG, HS/FS x 1 | OTG, HS/FS x 2 | OTG, HS/FS x 2 |
| CAN | 0 | 1 | 2 |
| Graphic | None | None | PxP |
| CSI | None | None | 16-bit Parallel CSI |
| LCD | None | None | 24-bit Parallel LCD |
| QSPI | 1 | 1 | 1 |
| SDIO | 2 | 2 | 2 |
| UART | 4 | 8 | 8 |
| IIC | 2 | 4 | 4 |
| SPI | 2 | 4 | 4 |
| I²S/SAI | 1 | 3 | 3 |
| ESAI | 1 | 1 | 1 |
| S/PDIF | 1 | 1 | 1 |
| Timer/PWM | Timer x 2, PWM x 4 | Timer x 4, PWM x 8 | Timer x 4, PWM x 8 |
| 12-bit ADC | 1 x 10-ch. | 1 x 10-ch. | 2 x 10-ch. |
| Security | None | AES-128, HAB | AES-128, HAB |
| Temperature | 0 °C to 95 °C (Tj) -40 °C to 105 °C (Tj) | 0 °C to 95 °C (Tj) -40 °C to 105 °C (Tj) | 0 °C to 95 °C (Tj) -40 °C to 105 °C (Tj) |

## www.nxp.com/iMX6ULL and www.imxcommunity.org

Product Longevity