DART-6UL Fact Sheets

A highly scalable System-on-Module based on NXP's i.MX 6UL, i.MX 6ULL or i.MX 6ULZ ARM Cortex-A7™ processor, with up to 900MHz and a variety of interfaces and connectivity options.

Variscite offers four pin-compatible variants of the DART-6UL SoM based on the following NXP's processors: i.MX 6UL G2, i.MX 6UL G3, i.MX 6ULL Y2 and the i.MX 6ULZ.

The next comparison table summarizes the main processor differences, accompanied below by NXP's related fact sheets. Please refer to the DART-6UL datasheet for a more detailed information on the available interfaces and pin mux options of the SoM.

Feature	6ULZ	6ULL - Y2	6UL- G2	6UL - G3
Sub Family	iMX6ULZ Base	iMX6ULL General Purpose	iMX6UL extra security	iMX6UL extra security
Core	ARM Cortex-A7	ARM Cortex-A7	ARM Cortex-A7	ARM Cortex-A7
Speed	900MHz	Up to 900 MHz	Up to 696 MHz	Up to 528 MHz
Cache	32 KB-I, 32KB-D, 128 KB L2	32 KB-I, 32KB-D, 128 KB L2	32 KB-I, 32KB-D, 128 KB	32 KB-I, 32KB-D, 128 KB L2
OCRAM	128 KB	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	16-bit LP-DDR2, DDR3/DDR3L
eFuse for Customer	256-bit	256-bit	1536-bit	2048-bit
NAND (BCH40)	Yes	Yes	Yes	Yes
Parallel Nor/EBI	Yes	Yes	Yes	Yes
Ethernet	None	10/100 MB x 2	10/100 MB x 2	10/100 MB x 2
USB with PHY	OTG, HS/FS x 2	OTG, HS/FS x 2	OTG, HS/FS x 2	OTG, HS/FS x 2
CAN	0	2	2	2
Graphic	None	PxP	PxP	PxP
CSI	None	24-bit Parallel CSI	24-bit Parallel CSI	24-bit Parallel CSI
LCD	None	24-bit Parallel LCD	24-bit Parallel LCD	24-bit Parallel LCD
QSPI	1	1	1	1
SDIO	2	2	2	2
UART	4	8	8	8
IIC	2	4	4	4
SPI	2	4	4	4
I2S/SAI	3	3	3	3
ESAI	1	1	None	None
S/PDIF	1	1	1	1
Timer/PWM	Timer x2, PWM x4	Timer x4, PWM x8	Timer x4, PWM x8	Timer x4, PWM x8
12-bit ADC	None	2 x 8ch	2 x 10ch	2 x 10ch
Security	AES/SHA, Secure boot	AES/SHA, Secure boot	TRNG, Crypto Engine (AES/TDES/SHA), Secure Boot	TRNG, Crypto Engine (AES with DPA/TDES/SHA/RSA), Secure Boot, tamper monitor, PCI4.0 pre-certification, OTF DRAM encryption
Temperature	0°C to 85°C (Tj)	-40°C to 85°C (Tj)	-40°C to 85°C (Tj)	-40°C to 85°C (Tj)

Variscite

Power-efficient and secure solutions

i.MX 6UltraLite Applications Processors

The i.MX 6UltraLite processor is a high-performance, ultra-efficient processor family featuring an advanced implementation of a single ARM® Cortex®-A7 core, which operates at speeds up to 696 MHz.

TARGET APPLICATIONS

- Automotive telematics
- Human-machine interface (HMI)
- IoT gateways
- Home energy management systems
- Smart energy concentrators
- Intelligent industrial control systems
- Portable medical
- Electronics point-of-sale devices
- Printers and 2D scanners
- Smart appliances
- Financial payment systems

The i.MX 6UltraLite applications processor includes an integrated power management module that reduces the complexity of 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 NOR, SD and a wide range of other interfaces for connecting peripherals such as WLAN, Bluetooth®, GPS, displays and camera sensors. The i.MX 6UltraLite is supported by discrete component power circuitry.

i.MX 6UltraLite FEATURES

- Single ARM Cortex-A7 core can provide a more cost-effective and more power-efficient solution
- Flexible boot options, including support for Quad SPI NOR, raw NAND, eMMC and SD and a memory controller that interfaces to both DDR3/DDR3L and low-power mobile DDR2 memory
- Processor delivers hardware-enabled security features that enable secure e-commerce, digital rights management (DRM), information encryption, “on-the-fly” DRAM encryption, secure boot and secure software downloads
- 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, two smart card interfaces compatible with EMV Standard v4.3 and a variety of other popular interfaces (such as UART, I^2C, and I^2S serial audio)

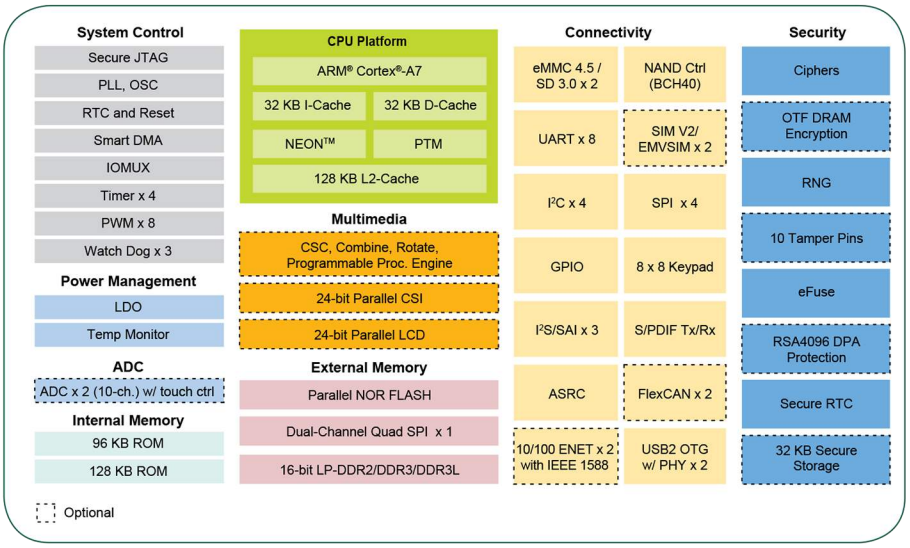
PACKAGE TECHNOLOGY

The i.MX 6UltraLite processor provides multiple compatible and scalable package options. The 14 x 14 289 MAPBGA with 0.8 mm pitch brings out all features and GPIOs. It is ideal for simple and low-cost 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 6UltraLite processor is supported by the i.MX 6UltraLite evaluation kit that includes a CPU module and a base board.

i.MX 6UltraLite APPLICATIONS PROCESSOR BLOCK DIAGRAM



i.MX 6UltraLite DEVICE OPTIONS

- Red indicates change from column to the left

Feature	MCIMX6G0	MCIMX6G1	MCIMX6G2	MCIMX6G3
Speed	528 MHz	528 MHz, 696 MHz	528 MHz, 696 MHz	528 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	32 KB-I, 32 KB-D 128 KB L2
OCRAM	128 KB	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	16-bit LP-DDR2, DDR3/DDR3L
eFuse for Customer	512-bit	1024-bit	1536-bit	2048-bit
NAND (BCH40)	Yes	Yes	Yes	Yes
Parallel NOR/EBI	Yes	Yes	Yes	Yes
Ethernet	10/100-Mbit/s x 1	10/100-Mbit/s x 1	10/100-Mbit/s x 2	10/100-Mbit/s x 2
USB with PHY	OTG, HS/FS x 1	OTG, HS/FS x 2	OTG, HS/FS x 2	OTG, HS/FS x 2
CAN	0	1	2	2
Security	Basic	TRNG, Crypto Engine (AES/TDES/SHA), Secure Boot	TRNG, Crypto Engine (AES/TDES/SHA), Secure Boot	TRNG, Crypto Engine (AES with DPA/TDES/SHA/RSA), Secure Boot, tamper monitor, PCI4.0 pre-certification, OTF DRAM encryption
Graphic	None	None	PxP	PxP
CSI	None	None	24-bit Parallel CSI	24-bit Parallel CSI
LCD	None	None	24-bit Parallel LCD	24-bit Parallel LCD
Quad SPI	1	1	1	1
SDIO	2	2	2	2
UART	4	8	8	8
I²C	2	4	4	4
SPI	2	4	4	4
I²S/SAI	1	3	3	3
S/PDIF	1	1	1	1
Timer/PWM	Timer x 2, PWM x 4	Timer x 4, PWM x 8	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.	2 x 10-ch.

www.nxp.com/iMX6UltraLite
www.imxcommunity.org

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Product Longevity

Energy Efficient Solutions by Freescale

Power-efficient, cost-optimized products

i.MX 6ULL Applications Processors

The i.MX 6ULL processor is a high-performance, ultra-efficient processor family featuring an advanced implementation of a single ARM® Cortex®-A7 core, which operates at speeds up to 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, I^2C, and I^2S serial audio)

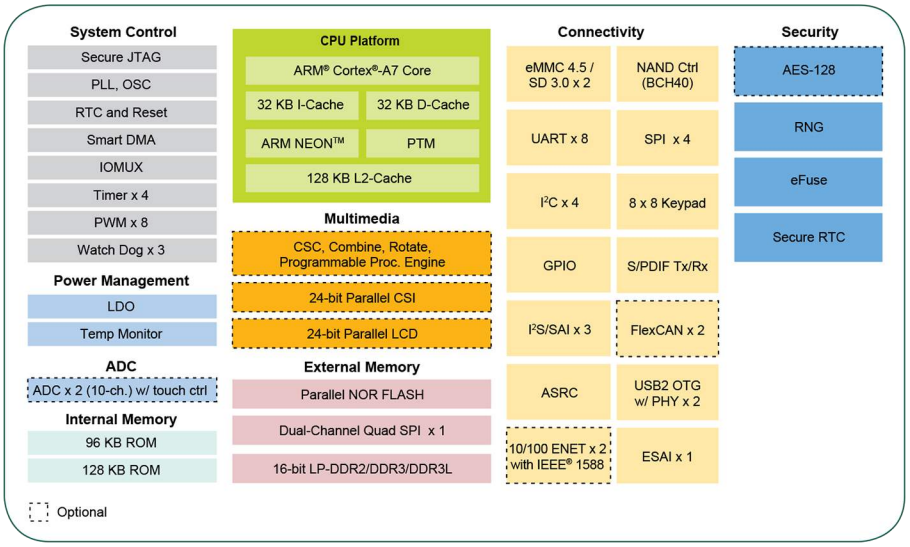
PACKAGE TECHNOLOGY

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



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

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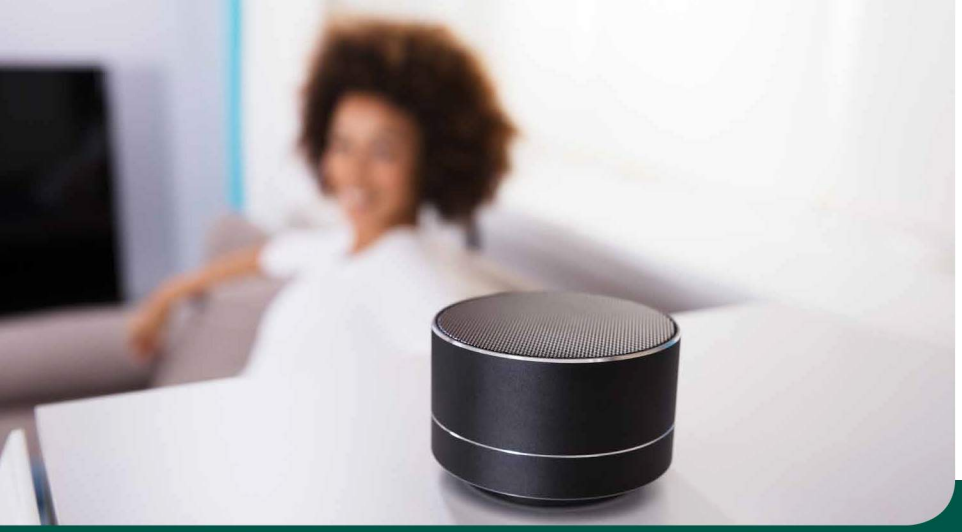
Product Longevity

Energy Efficient Solutions by Freescale



Ultra Low Cost Linux® Applications Processors

i.MX 6ULZ Applications Processors

The i.MX 6ULZ processor is a high-performance, ultra-efficient consumer processor featuring an advanced implementation of a single Arm® Cortex®-A7 core, which operates at 900 MHz.

TARGET APPLICATIONS

- Computing Engine
- Consumer Electronics
- Audio
- Voice control

The i.MX 6ULZ application processors includes full audio suite: ESAI, I²S X 3, S/PDIF, and 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® and GPS. The i.MX 6ULZ is supported by discrete component power circuitry.

i.MX 6ULZ 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), and a variety of other popular interfaces (such as UART, I²C, and I²S serial audio)

PACKAGE TECHNOLOGY

The i.MX 6ULZ processor provides 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.

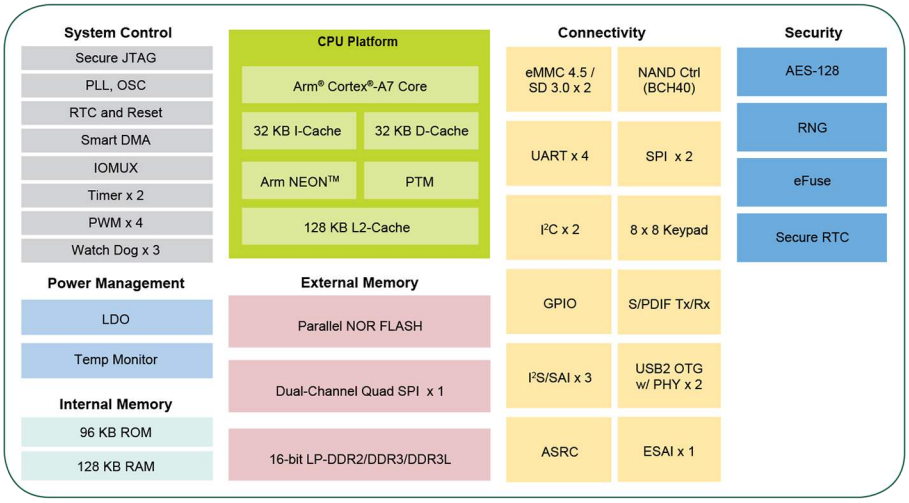
SOFTWARE AND TOOLS

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

i.MX 6ULZ DEVICE OPTIONS

Feature	MCIMX6Z0
Core	Arm® Cortex-A7
Speed	900 MHz
Cache	32 KB-I, 32 KB-D
OCRAM	128 KB
DRAM	16-bit LP-DDR2, DDR3/DDR3L
eFuse for customer	256-bit
NAND (BCH40)	Yes
Parallel Nor/EBI	Yes
SDIO	2
UART	4
IIC	2
SPI	2
I²S/SAI	3
ESAI	1
S/PDIF	1
Timer/PWM	Timer x 2, PWM x 4
Temperature	0°C to 95°C (Tj)

i.MX 6ULZ APPLICATIONS PROCESSOR BLOCK DIAGRAM



www.nxp.com/iMX6ULZ and www.imxcommunity.org

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Product Longevity

Energy Efficient Solutions by Freescale