



Arm[®] Core-Based Embedded Microprocessors

High Performance, Power Efficient, Secure, Easy to Use



| Product | Core Sub-System | | | | Memory | | | | | | | | | | Connectivity | | | | | |
|----------------|-----------------|---------------------|-------------------|------------------------|-----------------|-------------------|-----------|--|---------------|----------------|-------------------|-------------------|---------------|---------------|--------------|-----|-----------|--------------------------|-----|-------------|
| | Core | VFPV/NEON/Trustzone | Clock Speed (MHz) | Core Operating Voltage | DDR2 SDRAM (MB) | LPDDR2 SDRAM (MB) | SRAM (KB) | L1 Cache Memory (KB) (Instruction/Data) | L2 Cache (KB) | QSPI Interface | DDR2/LPDDR/LPDDR2 | DDR3/DDR3L/LPDDR3 | NAND | | UART | SPI | TWI (I2C) | SSC and I ² S | CAN | Device Only |
| | | | | | | | | | | | | | SLC ECC (bit) | MLC ECC (bit) | | | | | | |
| SAMA5D21 | Cortex-A5 | 1/1/1 | 500 | 1.2V | - | - | 128 | 2 x 32 | 128 | 2 | 1/1/1 | 1/1/1 | 32 | 32 | 9 | 6 | 6 | 4 | - | - |
| SAMA5D22 | Cortex-A5 | 1/1/1 | 500 | 1.2V | - | - | 128 | 2 x 32 | 128 | 2 | 1/1/1 | 1/1/1 | 32 | 32 | 9 | 6 | 6 | 4 | 1 | - |
| SAMA5D225C-D1M | Cortex-A5 | 1/1/1 | 500 | 1.2V | 16 | - | 128 | 2 x 32 | 128 | 2 | 1/1/1 | 1/1/1 | 32 | 32 | 9 | 7 | 7 | 4 | 1 | - |
| SAMA5D23 | Cortex-A5 | 1/1/1 | 500 | 1.2V | - | - | 128 | 2 x 32 | 128 | 2 | 1/1/1 | 1/1/1 | 32 | 32 | 9 | 6 | 6 | 4 | 1 | - |
| SAMA5D24 | Cortex-A5 | 1/1/1 | 500 | 1.2V | - | - | 128 | 2 x 32 | 128 | 2 | 1/1/1 | 1/1/1 | 32 | 32 | 10 | 7 | 7 | 4 | - | - |
| SAMA5D26 | Cortex-A5 | 1/1/1 | 500 | 1.2V | - | - | 128 | 2 x 32 | 128 | 2 | 1/1/1 | 1/1/1 | 32 | 32 | 10 | 7 | 7 | 4 | - | - |
| SAMA5D27 | Cortex-A5 | 1/1/1 | 500 | 1.2V | - | - | 128 | 2 x 32 | 128 | 2 | 1/1/1 | 1/1/1 | 32 | 32 | 10 | 7 | 7 | 4 | 2 | - |
| SAMA5D27C-D5M | Cortex-A5 | 1/1/1 | 500 | 1.2V | 64 | - | 128 | 2 x 32 | 128 | 2 | 1/1/1 | 1/1/1 | 32 | 32 | 10 | 7 | 7 | 4 | 2 | - |
| SAMA5D27C-D1G | Cortex-A5 | 1/1/1 | 500 | 1.2V | 128 | - | 128 | 2 x 32 | 128 | 2 | 1/1/1 | 1/1/1 | 32 | 32 | 10 | 7 | 7 | 4 | 2 | - |
| SAMA5D27C-LD1G | Cortex-A5 | 1/1/1 | 500 | 1.2V | - | 128 | 128 | 2 x 32 | 128 | 2 | 1/1/1 | 1/1/1 | 32 | 32 | 10 | 7 | 7 | 4 | 2 | - |
| SAMA5D27C-LD2G | Cortex-A5 | 1/1/1 | 500 | 1.2V | - | 256 | 128 | 2 x 32 | 128 | 2 | 1/1/1 | 1/1/1 | 32 | 32 | 10 | 7 | 7 | 4 | 2 | - |
| SAMA5D28 | Cortex-A5 | 1/1/1 | 500 | 1.2V | - | - | 128 | 2 x 32 | 128 | 2 | 1/1/1 | 1/1/1 | 32 | 32 | 10 | 7 | 7 | 4 | 2 | - |
| SAMA5D28C-D1G | Cortex-A5 | 1/1/1 | 500 | 1.2V | 128 | - | 128 | 2 x 32 | 128 | 2 | 1/1/1 | 1/1/1 | 32 | 32 | 10 | 7 | 7 | 4 | 2 | - |
| SAMA5D28C-LD1G | Cortex-A5 | 1/1/1 | 500 | 1.2V | - | 128 | 128 | 2 x 32 | 128 | 2 | 1/1/1 | 1/1/1 | 32 | 32 | 10 | 7 | 7 | 4 | 2 | - |
| SAMA5D28C-LD2G | Cortex-A5 | 1/1/1 | 500 | 1.2V | - | 256 | 128 | 2 x 32 | 128 | 2 | 1/1/1 | 1/1/1 | 32 | 32 | 10 | 7 | 7 | 4 | 2 | - |
| SAMA5D31 | Cortex-A5 | 1/-/- | 536 | 1.2V | - | - | 128 | 2 x 32 | - | - | 1/1/1 | - | 24 | 24 | 7 | 6 | 3 | 2 | - | - |
| SAMA5D33 | Cortex-A5 | 1/-/- | 536 | 1.2V | - | - | 128 | 2 x 32 | - | - | 1/1/1 | - | 24 | 24 | 5 | 6 | 3 | 2 | - | - |
| SAMA5D34 | Cortex-A5 | 1/-/- | 536 | 1.2V | - | - | 128 | 2 x 32 | - | - | 1/1/1 | - | 24 | 24 | 5 | 6 | 3 | 2 | 2 | - |
| SAMA5D35 | Cortex-A5 | 1/-/- | 536 | 1.2V | - | - | 128 | 2 x 32 | - | - | 1/1/1 | - | 24 | 24 | 7 | 6 | 3 | 2 | 2 | - |
| SAMA5D36 | Cortex-A5 | 1/1/1 | 536 | 1.2V | - | - | 128 | 2 x 32 | - | - | 1/1/1 | - | 24 | 24 | 7 | 6 | 3 | 2 | 2 | - |
| SAMA5D41 | Cortex-A5 | 1/1/1 | 600 | 1.8V | - | - | 128 | 2 x 32 | 128 | - | 1/1/1 | - | 24 | 24 | 8 | 8 | 4 | 2 | - | - |
| SAMA5D42 | Cortex-A5 | 1/1/1 | 600 | 1.8V | - | - | 128 | 2 x 32 | 128 | - | 1/1/1 | - | 24 | 24 | 8 | 8 | 4 | 2 | - | - |
| SAMA5D43 | Cortex-A5 | 1/1/1 | 600 | 1.8V | - | - | 128 | 2 x 32 | 128 | - | 1/1/1 | - | 24 | 24 | 8 | 8 | 4 | 2 | - | - |
| SAMA5D44 | Cortex-A5 | 1/1/1 | 600 | 1.8V | - | - | 128 | 2 x 32 | 128 | - | 1/1/1 | - | 24 | 24 | 8 | 8 | 4 | 2 | - | - |

Temperature Range: -40°C to +85°C (ambient), except where indicated

UART: Support for RS485, ISO7816, IrDA®, LIN, modem control lines and SPI on selected UARTs.

TWI: Two-Wire Interface, interconnects components on a two-wire bus.

SSC: Serial Synchronous Controller, supports many serial synchronous communications protocols used in audio and telecom applications such as I2S, short or long frame sync.

16-bit and 32-bit Timers: Capture/compare, waveform generation and PWM modes.

ECC: Error Corrected Code controller.

Security level: Adv. = hardware encryption engine + on the fly DDR encryption/decryption + secure storage + tamper pin Med. = hardware encryption engine only

System on Module (SoM)

| Product | MPU | Microchip Components |
|-----------------|---|---|
| SAMA5D27-SOM1 | System-In-Package (SAMA5D27C-D1G) including 500 MHz Arm® Cortex®-A5 Processor and 128 MByte DDR2 SDRAM | Power Management Unit (MIC2800-G1JJYML) 2 Kb Serial EEPROM with EUI-48™ Node Identity (24AA02E48T-I/OT) 64 Mb Serial Quad I/O Flash Memory (SST26VF064BT-104I/MF) 10Base-T/100Base-TX Ethernet PHY (KSZ8081RNAIA) Integrated Crystals and Internal Voltage Regulators |
| SAMA5D27-WLSOM1 | System-In-Package (SAMA5D27C-LD2G) including 500 MHz Arm Cortex-A5 Processor and 256 MByte LPDDR2 SDRAM | Power Management Unit (MCP16502AC-E/S8B) IEEE 802.11 n/g/n Link Controller with integrated Bluetooth® 4.0 (ATWILC3000-MR110UA) CryptoAuthentication™ Device (ATECC608-TNGTLSU) 64 Mb Serial Quad I/O Flash Memory (SST26VF064BEUI-104I/MF) 10Base-T/100Base-TX Ethernet PHY (KSZ8081RNAIA) Analog Comparator (MIC842NYMT) Clock Oscillators and Internal Voltage Regulators |

SAMA5 Arm Cortex-A5 MPUs

| USB | | | | | User Interface | | | | | | Security | | | | Control | | | | Max I/O Pins | Extended Temperature Range (-40 to 105°C Ambient) | Packages | |
|-----------------|--------------|---------------------|-----------------|-------------------|----------------|-------------|-------------|------------------------------------|------------------------|------------------|-----------------------|-------------------|-------------|------------------|------------------------|---------------|--------------|---------------------|--------------|--|----------|--|
| Device and Host | Host Only | 10/100 Ethernet MAC | 10/100/1000 MAC | IEEE 1588 Support | SD/eMMC | Graphic LCD | LCD Overlay | Resistive (R) and/or CAP (C) Touch | Hardware Video Decoder | Camera Interface | Class D/PDM/Audio PLL | Security Level | Secure Boot | Anti-Tamper Pins | Environmental Monitors | 32-bit Timers | PWM Channels | 10-bit ADC Channels | | | | 12-bit ADC Channels |
| 1 HS | 1 HS | 1 | - | Y | 1 | 1 | Y | R | - | 1 | 1/1/1 | Med. | Y | 6 | - | 5 | 4 | - | 5 | 72 | - | BGA 196, 11 x 11, 0.75 mm pitch |
| 1 HS | 1 HS | 1 | - | Y | 1 | 1 | Y | R, C | - | 1 | 1/1/1 | Adv. | Y | 6 | - | 5 | 4 | - | 5 | 72 | Y | BGA 196, 11 x 11, 0.75 mm pitch |
| 1 HS | 1 HS | 1 | - | Y | 2 | 1 | Y | R, C | - | 1 | 1/1/1 | Adv. | Y | 6 | - | 5 | 4 | - | 5 | 90 | - | BGA 196, 11 x 11, 0.75 mm pitch |
| 1 HS | 1 HS | 1 | - | Y | 1 | 1 | Y | R, C | - | 1 | 1/1/1 | PCI Pre-certified | Y | 6 | Y | 5 | 4 | - | 5 | 72 | Y | BGA 196, 11 x 11, 0.75 mm pitch |
| 1 HS | 1 HS, 1 HSIC | 1 | - | Y | 2 | 1 | Y | R, C | - | 1 | 1/1/1 | Adv. | Y | 2 | - | 6 | 4 | - | 12 | 105 | - | BGA 256, 8 x 8, 0.4 mm pitch |
| 1 HS | 1 HS | 1 | - | Y | 2 | 1 | Y | R | - | 1 | 1/1/1 | Med. | Y | 8 | - | 6 | 4 | - | 12 | 128 | Y | BGA 289, 14 x 14, 0.8 mm pitch |
| 1 HS | 1 HS, 1 HSIC | 1 | - | Y | 2 | 1 | Y | R, C | - | 1 | 1/1/1 | Adv. | Y | 8 | - | 6 | 4 | - | 12 | 128 | Y | BGA 289, 14 x 14, 0.8 mm pitch |
| 1 HS | 1 HS, 1 HSIC | 1 | - | Y | 2 | 1 | Y | R, C | - | 1 | 1/1/1 | Adv. | Y | 8 | - | 6 | 4 | - | 12 | 128 | - | BGA 289, 14 x 14, 0.8 mm pitch |
| 1 HS | 1 HS, 1 HSIC | 1 | - | Y | 2 | 1 | Y | R, C | - | 1 | 1/1/1 | Adv. | Y | 8 | - | 6 | 4 | - | 12 | 128 | - | BGA 289, 14 x 14, 0.8 mm pitch |
| 1 HS | 1 HS, 1 HSIC | 1 | - | Y | 2 | 1 | Y | R, C | - | 1 | 1/1/1 | Adv. | Y | 8 | - | 6 | 4 | - | 12 | 128 | - | BGA 361, 16 x 16, 0.8 mm pitch |
| 1 HS | 1 HS, 1 HSIC | 1 | - | Y | 2 | 1 | Y | R, C | - | 1 | 1/1/1 | Adv. | Y | 8 | - | 6 | 4 | - | 12 | 128 | - | BGA 361, 16 x 16, 0.8 mm pitch |
| 1 HS | 1 HS, 1 HSIC | 1 | - | Y | 2 | 1 | Y | R, C | - | 1 | 1/1/1 | PCI Pre-certified | Y | 8 | Y | 6 | 4 | - | 12 | 128 | Y | BGA 289, 14 x 14, 0.8 mm pitch |
| 1 HS | 1 HS, 1 HSIC | 1 | - | Y | 2 | 1 | Y | R, C | - | 1 | 1/1/1 | PCI Pre-certified | Y | 8 | Y | 6 | 4 | - | 12 | 128 | - | BGA 289, 14 x 14, 0.8 mm pitch |
| 1 HS | 1 HS, 1 HSIC | 1 | - | Y | 2 | 1 | Y | R, C | - | 1 | 1/1/1 | PCI Pre-certified | Y | 8 | Y | 6 | 4 | - | 12 | 128 | - | BGA 361, 16 x 16, 0.8 mm pitch |
| 1 HS | 1 HS, 1 HSIC | 1 | - | Y | 2 | 1 | Y | R, C | - | 1 | 1/1/1 | PCI Pre-certified | Y | 8 | Y | 6 | 4 | - | 12 | 128 | - | BGA 361, 16 x 16, 0.8 mm pitch |
| 1 HS | 2 HS | 1 | - | Y | 3 | 1 | Y | R | - | 1 | - | Med. | Y | - | - | 5 | 4 | - | 12 | 160 | - | BGA 324, 15 x 15, 0.8 mm pitch, BGA 324, 12 x 12, 0.5 mm pitch |
| 1 HS | 2 HS | - | 1 | Y | 2 | 1 | Y | R | - | 1 | - | Med. | Y | - | - | 5 | 4 | - | 12 | 160 | - | BGA 324, 15 x 15, 0.8 mm pitch |
| 1 HS | 2 HS | - | 1 | Y | 3 | 1 | Y | R | - | 1 | - | Med. | Y | - | - | 5 | 4 | - | 12 | 160 | - | BGA 324, 15 x 15, 0.8 mm pitch |
| 1 HS | 2 HS | 1 | 1 | Y | 3 | - | - | R | - | 1 | - | Med. | Y | - | - | 6 | 4 | - | 12 | 160 | Y | BGA 324, 15 x 15, 0.8 mm pitch |
| 1 HS | 2 HS | 1 | 1 | Y | 3 | 1 | Y | R | - | 1 | - | Med. | Y | - | - | 6 | 4 | - | 12 | 160 | Y | BGA 324, 15 x 15, 0.8 mm pitch |
| 1 HS | 2 HS | 2 | - | Y | 2 | 1 | Y | R | - | 1 | - | Adv. | Y | 8 | - | 9 | 4 | 5 | - | 152 | - | BGA 289, 14 x 14, 0.8 mm pitch |
| 1 HS | 2 HS | 2 | - | Y | 2 | 1 | Y | R | - | 1 | - | Adv. | Y | 8 | - | 9 | 4 | 5 | - | 152 | - | BGA 361, 16 x 16, 0.8 mm pitch |
| 1 HS | 2 HS | 2 | - | Y | 2 | 1 | Y | R | 30 fps, 720p | 1 | - | Adv. | Y | 8 | - | 9 | 4 | 5 | - | 152 | - | BGA 289, 14 x 14, 0.8 mm pitch |
| 1 HS | 2 HS | 2 | - | Y | 2 | 1 | Y | R | 30 fps, 720p | 1 | - | Adv. | Y | 8 | - | 9 | 4 | 5 | - | 152 | - | BGA 361, 16 x 16, 0.8 mm pitch |

Camera Interface: For CMOS-type image sensor, ITU-R BT. 601/656 external interface, programmable frame capture rate, up to 12-bit data interface, SAV and EAV synchronization, preview path with scaling, output is in YCbCr format; Raw Bayer is supported on the ATSAMA5D2 series.

Graphics LCD: 24-bit parallel interface; supports STN and TFT displays, up to 16-bits per pixel in STN color mode, up to 16M colors in TFT mode.

Video Decoder: Hardware video decoding and image post processing : H.264, MPEG4, H.263, MPEG2, JPEG, VP8.

eMMC™: V4.3 – MLC NandFlash supported through eMMC interface; V4.5 support for ATSAMA5D2 series.

USB: High speed (HS) or Full Speed (FS), High Speed Inter-Chip (HSIC)

Peripheral implementation varies among products. Consult individual product datasheets for a detailed description.

FLEXCOM: Flexible Serial Communication Controller that can be configured as USART, SPI or TWI.

PTC: Peripheral Touch Controller, built-in hardware for capacitive touch buttons, sliders and wheels.

| SoM Interfaces | Dimensions (mm) | Number of Pins | IO Pins | Main Supply Voltage | Temperature Range | Connector Style | Metal Shield Ready | Optional Voltage Supplies |
|---|-----------------|----------------|---------|---------------------|-------------------|-------------------------------------|--------------------|---|
| 4 UARTS, 4 FLEXCOMs, 2 SPI, TWI, QSPI, SSC, I ² S, 6 PTC Buttons, 4 ADC, 2 CAN-FD, 3 HS-USB Host/Device and HSIC, 10 Base-100Base-TX Ethernet, 2 SD/MMC/eMMC/SDIO, 24-bit RGB, Camera - ISC, Mono PDMIC, Class D Stereo, 6 Tamper Pins, Shutdown and Reset control pins | 38 x 40 | 176 | 103 | 3.3V | -40°C to +85°C | Single-sided, hand-solderable board | Yes | VDDBU, VDDSDHC, VDDISC |
| 5 UARTS, 4 FLEXCOMs, 2 SPI, TWI, 2 QSPI, SSC, I ² S, Full PTC, 6 ADC, CAN-FD, 2 HS-USB Host/Device and HSIC, 10 Base-100Base-TX Ethernet, SD/MMC/eMMC, 18-bit RGB, Camera - ISC, Mono PDMIC, Class D Mono, 7 Tamper Pins, Start, Shutdown, Wake-Up and Reset control pins | 40.8 x 40.8 | 188 | 94 | 5V | -40°C to +85°C | Single-sided, hand-solderable board | No | VDDBU, VDDSDHC, VDDISC, VDDFUSE, VDDANA |

| Product | Core Sub-System | | | | Memory | | | | | | | | | Connectivity | | | | | | | |
|--------------------|-----------------|-------------------|------------------------|------------|-----------------|-----------|--|-------------|----------------|------------------------|--------------------|---------------|---------------|--------------|-----|------------------------|--------------------------|-----|-------------|-----------------|------------|
| | Core | Clock Speed (MHz) | Core Operating Voltage | SDRAM (MB) | DDR2 SDRAM (MB) | SRAM (KB) | L1 Cache Memory (KB) (Instruction/Data) | LPDDR/SDRAM | QSPI Interface | External Bus Interface | DDR2/LPDDR/ LPDDR2 | NAND | | UART | SPI | TWI (I ² C) | SSC and I ² S | CAN | USB | | |
| | | | | | | | | | | | | SLC ECC (bit) | MLC ECC (bit) | | | | | | Device Only | Device and Host | Host Only |
| SAM9X60 | ARM926EJ-S | 600 | 1.2V | - | - | 64 | 2 × 32 | 1/1 | 1 | 1 | 1/1/- | 24 | 24 | 13 | 6 | 13 | 2 | 2 | - | 1 HS | 3 HS |
| SAM9X60D6K | ARM926EJ-S | 600 | 1.2V | 8 | - | 64 | 2 × 32 | 1/1 | 1 | 1 | 1/1/- | 24 | 24 | 13 | 6 | 13 | 2 | 2 | - | 1 HS | 3 HS |
| SAM9X60D5M | ARM926EJ-S | 600 | 1.2V | - | 64 | 64 | 2 × 32 | 1/1 | 1 | 1 | 1/1/- | 24 | 24 | 13 | 6 | 13 | 2 | 2 | - | 1 HS | 3 HS |
| SAM9X60D1G | ARM926EJ-S | 600 | 1.2V | - | 128 | 64 | 2 × 32 | 1/1 | 1 | 1 | 1/1/- | 24 | 24 | 13 | 6 | 13 | 2 | 2 | - | 1 HS | 3 HS |
| SAM9M10/M11 | ARM926EJ-S | 400 | 1.0V | - | - | 64 | 2 × 32 | 1/1 | - | 2 | 1/1/- | 1 | - | 5 | 6 | 2 | 2 | - | - | 1 HS | 2 HS |
| SAM9G45/G46 | ARM926EJ-S | 400 | 1.0V | - | - | 64 | 2 × 32 | 1/1 | - | 2 | 1/1/- | 1 | - | 5 | 6 | 2 | 2 | - | - | 1 HS | 2 HS |
| SAM9X35 | ARM926EJ-S | 400 | 1.0V | - | - | 32 | 2 × 16 | 1/1 | - | 1 | 1/1/- | 24 | 24 | 7 | 5 | 3 | 1 | 2 | - | 1 HS | 1 HS, 1 FS |
| SAM9X25 | ARM926EJ-S | 400 | 1.0V | - | - | 32 | 2 × 16 | 1/1 | - | 1 | 1/1/- | 24 | 24 | 7 | 6 | 3 | 1 | 2 | - | 1 HS | 1 HS, 1 FS |
| SAM9G35 | ARM926EJ-S | 400 | 1.0V | - | - | 32 | 2 × 16 | 1/1 | - | 1 | 1/1/- | 24 | 24 | 6 | 5 | 3 | 1 | - | - | 1 HS | 1 HS, 1 FS |
| SAM9G25 | ARM926EJ-S | 400 | 1.0V | - | - | 32 | 2 × 16 | 1/1 | - | 1 | 1/1/- | 24 | 24 | 7 | 6 | 3 | 1 | - | - | 1 HS | 1 HS, 1 FS |
| SAM9G15 | ARM926EJ-S | 400 | 1.0V | - | - | 32 | 2 × 16 | 1/1 | - | 1 | 1/1/- | 24 | 24 | 5 | 5 | 3 | 1 | - | - | 1 HS | 1 HS, 1 FS |
| SAM9CN12 | ARM926EJ-S | 400 | 1.0V | - | - | 32 | 2 × 16 | 1/1 | - | 1 | 1/1/- | 24 | 24 | 7 | 6 | 2 | 1 | - | 1 FS | - | 1 FS |
| SAM9CN11 | ARM926EJ-S | 400 | 1.0V | - | - | 32 | 2 × 16 | 1/1 | - | 1 | 1/1/- | 24 | 24 | 7 | 6 | 2 | 1 | - | 1 FS | - | 1 FS |
| SAM9N12 | ARM926EJ-S | 400 | 1.0V | - | - | 32 | 2 × 16 | 1/1 | - | 1 | 1/1/- | 24 | 24 | 7 | 6 | 2 | 1 | - | 1 FS | - | 1 FS |
| SAM9G20 | ARM926EJ-S | 400 | 1.0V | - | - | 32 | 2 × 32 | -/1 | - | 1 | - | 1 | - | 7 | 6 | 1 | 1 | - | 1 FS | - | 2 FS |
| SAM9G10 | ARM926EJ-S | 266 | 1.2V | - | - | 16 | 2 × 16 | -/1 | - | 1 | - | 1 | - | 4 | 5 | 1 | 3 | - | 1 FS | - | 2 FS |
| SAM9263 | ARM926EJ-S | 240 | 1.3V | - | - | 96 | 2 × 16 | -/1 | - | 2 | - | 1 | - | 4 | 5 | 1 | 2 | 1 | 1 FS | - | 2 FS |
| SAM9261 | ARM926EJ-S | 190 | 1.2V | - | - | 160 | 2 × 16 | -/1 | - | 1 | - | 1 | - | 4 | 5 | 1 | 3 | - | 1 FS | - | 2 FS |
| SAM9260 | ARM926EJ-S | 190 | 1.2V | - | - | 8 | 2 × 8 | -/1 | - | 1 | - | 1 | - | 7 | 6 | 1 | 1 | - | 1 FS | - | 2 FS |

Temperature Range: -40°C to +85°C (ambient)

UART: Support for RS485, ISO7816, IrDA®, LIN, modem control lines and SPI on selected UARTs.

TWI: Two-Wire Interface, interconnects components on a two-wire bus.

SSC: Serial Synchronous Controller, supports many serial synchronous communications protocols used in audio and telecom applications such as I2S, short or long frame sync.

16-bit and 32-bit Timers: Capture/compare, waveform generation and PWM modes.

ECC: Error Corrected Code controller.

Security level: Adv. = hardware encryption engine + on the fly DDR encryption/decryption + secure storage + tamper pin Med. = hardware encryption engine

ATSAM9 Arm9-Based MPUs

| Ethernet | | User Interface | | | | | | | | | Security | | | Control | | | | | Max I/O Pins | Extended Temperature Range (-40 to 105°C Ambient) | Packages |
|---------------------|---------|----------------|-------------|-------------|-----------------------|------------------------|-------------|------------------|---------|----------------|-------------|------------------|---------------|---------------|---------------|--------------|---------------------|---------------------|--------------|---|---|
| 10/100 Ethernet MAC | SD/eMMC | Soft Modem | Graphic LCD | LCD Overlay | Resistive Touchscreen | Hardware Video Decoder | 2D Graphics | Camera Interface | Class D | Security Level | Secure Boot | Anti-Tamper Pins | 16-bit Timers | 32-bit Timers | 64-bit Timers | PWM Channels | 10-bit ADC Channels | 12-bit ADC Channels | | | |
| 2 | 2 | - | 1 | Y | Y | - | Y | 1 | 1 | Adv. | Y | 8 | - | 6 | 1 | 4 | - | 12 | 112 | Y | BGA 228, 11 × 11, 0.65 mm pitch |
| 2 | 2 | - | 1 | Y | Y | - | Y | 1 | 1 | Adv. | Y | 8 | - | 6 | 1 | 4 | - | 12 | 112 | - | BGA 196, 11 × 11, 0.65 mm pitch |
| 2 | 2 | - | 1 | Y | Y | - | Y | 1 | 1 | Adv. | Y | 8 | - | 6 | 1 | 4 | - | 12 | 112 | - | BGA 233, 14 × 14, 0.8 mm pitch |
| 2 | 2 | - | 1 | Y | Y | - | Y | 1 | 1 | Adv. | Y | 8 | - | 6 | 1 | 4 | - | 12 | 112 | - | BGA 233, 14 × 14, 0.8 mm pitch |
| 1 | 2 | - | 1 | Y | Y | 30 fps, D1 | - | 1 | - | Med. (M11) | - | - | 6 | - | - | 4 | 8 | - | 160 | - | BGA 324, 15 × 15, 0.8 mm pitch |
| 1 | 2 | - | 1 | - | Y | - | - | 1 | - | Med. (G46) | - | - | 6 | - | - | 4 | 8 | - | 160 | - | BGA 324, 15 × 15, 0.8 mm pitch |
| 1 | 2 | Y | 1 | Y | Y | - | - | - | - | - | - | - | 6 | - | 4 | 12 | - | 105 | - | BGA 217, 15 × 15, 0.8 mm pitch | |
| 2 | 2 | Y | - | - | - | - | - | - | - | - | - | - | 6 | - | 4 | 12 | - | 105 | - | BGA 217, 15 × 15, 0.8 mm pitch | |
| 1 | 2 | Y | 1 | Y | Y | - | - | - | - | - | - | - | 6 | - | 4 | 12 | - | 105 | - | BGA 217, 15 × 15, 0.8 mm pitch | |
| 1 | 2 | Y | - | - | - | - | - | 1 | - | - | - | - | 6 | - | 4 | 12 | - | 105 | - | BGA 217, 15 × 15, 0.8 mm pitch, BGA 247, 10 × 10, 0.5 mm pitch | |
| - | 2 | Y | 1 | Y | Y | - | - | - | - | - | - | - | 6 | - | 4 | 12 | - | 105 | - | BGA 217, 15 × 15, 0.8 mm pitch | |
| - | 1 | - | 1 | - | Y | - | - | - | - | Med. | Y | - | 6 | - | - | 4 | 12 | - | 105 | - | BGA 217, 15 × 15, 0.8 mm pitch, BGA 247, 10 × 10, 0.5 mm pitch |
| - | 1 | - | 1 | - | Y | - | - | - | - | - | - | - | 6 | - | - | 4 | 12 | - | 105 | - | BGA 217, 15 × 15, 0.8 mm pitch, BGA 247, 10 × 10, 0.5 mm pitch |
| - | 1 | - | 1 | - | Y | - | - | - | - | - | - | - | 6 | - | - | 4 | 12 | - | 105 | - | BGA 217, 15 × 15, 0.8 mm pitch, BGA 247, 10 × 10, 0.5 mm pitch |
| 1 | 1 | - | - | - | - | - | - | Y | - | - | - | - | 6 | - | - | - | 4 | - | 96 | - | BGA 217, 15 × 15, 0.8 mm pitch |
| - | 1 | - | 1 | - | - | - | - | - | - | - | - | - | 3 | - | - | - | - | - | 96 | - | BGA 217, 15 × 15, 0.8 mm pitch |
| 1 | 2 | - | 1 | - | - | - | - | Y | - | - | - | - | 3 | - | - | 4 | - | - | 160 | - | BGA 324, 15 × 15, 0.8 mm pitch |
| - | 1 | - | 1 | - | - | - | - | - | - | - | - | - | 3 | - | - | - | - | - | 96 | - | BGA 217, 15 × 15, 0.8 mm pitch |
| 1 | 1 | - | - | - | - | - | - | Y | - | - | - | - | 6 | - | - | - | 4 | - | 96 | - | BGA 217, 15 × 15, 0.8 mm pitch, QFP 208, 28 × 28, 0.5 mm pitch |

Camera Interface: For CMOS-type image sensor, ITU-R BT. 601/656 external interface, programmable frame capture rate, up to 12-bit data interface, SAV and EAV synchronization, preview path with scaler, YCbCr format ; Raw Bayer support with ATSAMA5D2 series












Graphics LCD: 24-bit parallel interface; supports STN and TFT displays, up to 16-bits per pixel in STN color mode, up to 16M colors in TFT mode.






Hardware Video Decoder: Hardware video decoding and image post processing : H.264, MPEG4, H.263, MPEG2, JPEG, VP8.

2D Graphics: 2D Graphics Engine supporting fill BLT, copy BLT, transparent BLT, blend/alpha BLT, ROP4 BLT (Raster Operations) and command ring buffer.

eMMC: V4.3 – MLC NandFlash supported through MMC interface; V4.5 support for ATSAMA5D2 series.

USB: High speed (HS) or Full Speed (FS).

| Ordering Code | Supported Devices | Image |
|-----------------------|--|---|
| SAM9X60-EK | SAM9X60 |  |
| ATSAMA5D27-WLSOM1-EK1 | SAMA5D2-Series LPDDR2 SiP and Wireless SOM included |  |
| ATSAMA5D27-SOM1-EK1 | SAMA5D2-Series DDR2 SiP and SOM included |  |
| DM320108-BNDL | Bundle ATSAMA5D2-PTC-EK + QT1-XPRO |  |
| ATSAMA5D2C-XULT | SAMA5D2 Series |  |
| ATSAMA5D4-XULT | SAMA5D4 Series |  |
| ATSAMA5D3-XPLD | SAM5D3 Series |  |
| AT91SAM9M10-G45-EK | SAM9M10, SAM9G45 |  |
| AT91SAM9X35-EK | SAM9X35 |  |
| AT91SAM9X25-EK | SAM9X25 |  |
| AT91SAM9G35-EK | SAM9G35 |  |

| Ordering Code | Supported Devices | Image |
|-----------------|--|--|
| AT91SAM9G15-EK | SAM9G15 |  |
| AT91SAM9N12-EK | SAM9N12 |  |
| AT91SAM9G10-EK2 | SAM9G10 |  |
| AT91SAM9263-EK | SAM9263 |  |
| DV164232 | J-32 Debug Probe supporting all MPU products |  |

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Microchip has developed software solutions optimized for and tested on our Microprocessors (MPUs) to speed up your development and shorten time to market. For more information, visit www.microchip.com/design-centers/32-bit-mpus/software

Operating Systems

- Linux® Operating System (OS)
www.at91.com/linux4sam
- FreeRTOS
www.freertos.org

Bare Metal

- MPLAB® Harmony v3
<https://github.com/Microchip-MPLAB-Harmony/Microchip-MPLAB-Harmony.github.io/wiki>
- Softpacks
<https://github.com/atmelcorp/atmel-software-package/releases>

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Our MPUs are supported by a full range of development tools for software development, debugging and programming. The Linux cross-build environments, our MPLAB development ecosystems and selected partner solutions are particularly well suited for developing embedded applications. For more information, please visit www.microchip.com/design-centers/32-bit-mpus/development-tools

- Cross-build environments for Linux OS users
www.at91.com/linux4sam
- MPLAB X Integrated Development Environment
www.microchip.com/mplab/mplab-x-ide
- IAR Embedded Workbench for Arm® processors (EWARM)
www.iar.com/iar-embedded-workbench/partners/microchip/
- GNU Toolchain Bare Metal and RTOS-Based Systems Learning
developer.arm.com/tools-and-software/open-source-software/developer-tools/gnu-toolchain
- J-32 Debug Probe
www.microchip.com/DevelopmentTools/ProductDetails/DV164232
- SAM-BA In-System Programmer
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