

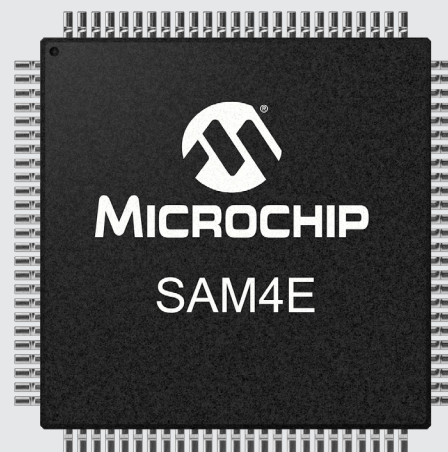
# SAM4E Microcontroller Family

ARM® Cortex®-M4 Processor-Based Devices for Industrial Automation and Building Control Applications

## Summary

Microchip's SAM4E family of microcontrollers (MCUs) delivers a rich set of advanced connectivity peripherals and a Floating Point Unit (FPU). Based on the 32-bit ARM® Cortex®-M4 processor, SAM4E devices operate up to 120 MHz and offer up to 1024 KB of Flash, 2 KB of cache memory and up to 128 KB of SRAM. The family further extends a growing Microchip portfolio of ARM processor-based devices.

The SAM4E family offers a rich set of advanced connectivity peripherals such as a 10/100 Mbps Ethernet MAC supporting IEEE 1588 and dual CAN. With a single-precision FPU, advanced analog features as well as a full set of timing and control functions, SAM4E MCUs are ideal for industrial automation, home and building control, machine-to-machine communications, automotive aftermarket and energy management applications.



### High Performance

- ARM Cortex-M4 processor running at 120 MHz
- Floating point unit
- 2 KB cache providing zero wait state flash access at full speed

### Connectivity

- 10/100 Ethernet MAC, supporting IEEE1588
- Dual CAN
- USB 2.0

### Advanced Analog

- Two 16-bit Analog-to-Digital Converters (ADCs) with up to 24 channels
- Programmable gain amplifier
- Offset error correction
- Gain error correction

### Real Time Event

- No CPU intervention
- No latency

SAM4E Key Features

Frequency	120 MHz
Flash	512 KB–1 MB
SRAM	128 KB
EMAC	1
USB	FS Device
CAN	2
USART	4
MCI/SDIO	Yes
Ext Bus Interface	Yes
SPI	3
I <sup>2</sup> C	2
Crypto	AES
Parallel Capture (CMOS int.)	Yes
2x16-bit ADC	Up to 24 Channels
12-bit DAC	Up to 2 Channels
Timers/ PWMs	9/4
GPIO	Up to 117
Pin Count	100–144
Package	QFP, BGA

## Key Applications

- Industrial Automation and machine-to-machine
  - Programmable logic controllers
  - Drive control
  - Robotics
- Building and home control
  - Concentrator
  - Access control
  - Control panels
  - Room control unit
- Energy management
  - Power supplies communication
  - Switch breakers communication
  - Inverters communication
- Automotive aftermarket
  - Fleet management
  - Telematics

## Faster Development with Integrated Platform

As with all of Microchip's AVR® and ARM Cortex-M processor-based devices, the SAM4E family is supported by the Atmel Studio IDE. Available as a free download, Atmel Studio includes the Software Framework, a complete library of source code, project examples, drivers and stacks. The IDE also features the Gallery apps store for embedded tools and extensions and the Spaces collaborative workspace for software and hardware projects based on AVR and SAM microcontrollers.

## Head Start on Your Designs

Get a fast start on your designs with the SAM4E Evaluation Kit (ATSAM4E-EK), featuring a SAM4E16EA microcontroller. The SAM4E Evaluation Kit is based on the integration of an ARM Cortex-M4 processor with on-board NAND Flash and a set of popular peripherals. It is designed to provide a high-performance, highly flexible processor evaluation platform for a wide range of applications.

## Device Ordering Information

Part Number	Flash	Package
ATSAM4E16EA-AU	1 MB	144-pin LQFP
ATSAM4E16EA-CU	1 MB	144-pin LFBGA
ATSAM4E16CA-AU	1 MB	100-pin LQFP
ATSAM4E16CA-CU	1 MB	100-pin LFBGA
ATSAM4E8EA-AU	512 KB	144-pin LQFP
ATSAM4E8EA-CU	512 KB	144-pin LFBGA
ATSAM4E8CA-AU	512 KB	100-pin LQFP
ATSAM4E8CA-CU	512 KB	100-pin LFBGA

