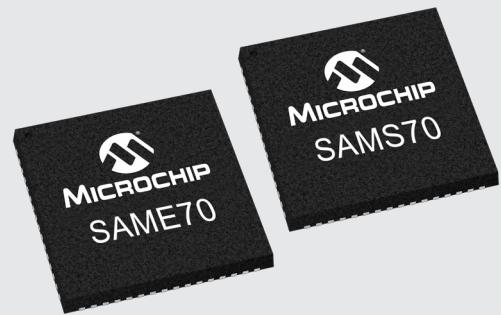


# SAMS70 and SAME70 Microcontroller Families

## Summary

The SAMS70 MCU family is based on the ARM® Cortex®-M7 core plus Floating Point Unit (FPU) extending Microchip's 32-bit microcontroller portfolio with maximum operating speeds of up to 300 MHz, 2 MB of Flash and up to 384 KB of multi-port SRAM, of which up to 256 KB can be assigned to tightly coupled memory (data and instructions) delivering a zero wait state at 300 MHz. The SAMS70 family is able to accelerate execution from on-chip Flash and Non-Volatile Memory (NVM) connected to Quad-SPI and EBI with 16 KB of data and 16 KB of instruction cache memory.



This unique memory architecture enables the SAMS70 family to be optimized for real-time deterministic code execution and low-latency peripheral data access. Additionally, the SAMS70 family includes an extensive peripheral set including high-speed USB host and device with high-speed PHY, up to eight UARTs, five SPI, three I<sup>2</sup>C, I<sup>2</sup>S™, SD/MMC interface, a CMOS camera interface, twelve 16-bit timers, eight 16-bits PWMs and analog interfaces. The SAME70 family includes similar features as the SAMS70 family as well as a 10/100 Ethernet MAC and dual Bosch CAN-FD interfaces with advanced analog features making them ideal for connectivity applications.

## Key Features

- ARM Cortex-M7 core running at 300 MHz
- FPU for high-precision computing and accelerated data processing
- High-performance internal-memory architecture with user-configurable tightly coupled memories and system memory/16 KB I and 16 KB D cache
- Dual Bosch CAN-FD controller
- 10/100 Ethernet MAC with IEEE 1588 and KSZ8061 PHY
- Quad-SPI with eXecute-In-Place
- High-speed USB host and device with on-chip high-speed PHY
- CMOS image sensor interface
- AES hardware-encryption engines, TRNG and SHA-based memory integrity checker
- Advanced analog front end based on dual 2 Msps, 12-bit ADCs, including 16-bit average, with up to 24 channels, offset error correction and gain control
- Dual 2 Msps, 12-bit DAC and analog comparator
- 64- to 144-pin package options
- Extended industrial temperature range from -40°C to 105°C

## Development Tools

### SAMV71 Xplained Ultra Evaluation Kit (ATSAMV71-XULT)



The SAM V71 Xplained Ultra evaluation kit is ideal for evaluating and prototyping with the SAMV71, SAM V70, SAM S70 and SAM E70 MCUs. Extension boards to the SAM V71 Xplained Ultra can be purchased individually. This kit is also compatible with Arduino Shields.

### SAME70 Xplained Evaluation Kit (ATSAME70-XPLD)



The SAME70-Xplained Evaluation Kit is ideal for evaluating and prototyping with the Microchip SAMS70 and SAME70 MCUs. It provides connectivity for Ethernet, HS USB and SD Cards as well as 2-XPRO extension headers. Extension boards for the SAME70 Xplained can be purchased individually.

## SAME70 Selector Guide

Product	Flash (KB)	Pin Count	CAN-FD	Ethernet	Temperature Range (°C)	Package
ATSAME70J19	512	64	Yes	Yes	–40 to 105	QFP
ATSAME70J20	1024	64	Yes	Yes	–40 to 105	QFP
ATSAME70J21	2048	64	Yes	Yes	–40 to 105	QFP
ATSAME70N19	512	100	Yes	Yes	–40 to 105	QFP, BGA
ATSAME70N20	1024	100	Yes	Yes	–40 to 105	QFP, BGA
ATSAME70N21	2048	100	Yes	Yes	–40 to 105	QFP, BGA
ATSAME70Q19	512	144	Yes	Yes	–40 to 105	QFP, BGA
ATSAME70Q20	1024	144	Yes	Yes	–40 to 105	QFP, BGA
ATSAME70Q21	2048	144	Yes	Yes	–40 to 105	QFP, BGA

## SAMS70 Selector Guide

Product	Flash (KB)	Pin Count	CAN-FD	Ethernet	Temperature Range (°C)	Package
ATSAMS70J19	512	64	No	No	–40 to 105	QFP
ATSAMS70J20	1024	64	No	No	–40 to 105	QFP
ATSAMS70J21	2048	64	No	No	–40 to 105	QFP
ATSAMS70N19	512	100	No	No	–40 to 105	QFP, BGA
ATSAMS70N20	1024	100	No	No	–40 to 105	QFP, BGA
ATSAMS70N21	2048	100	No	No	–40 to 105	QFP, BGA
ATSAMS70Q19	512	144	No	No	–40 to 105	QFP, BGA
ATSAMS70Q20	1024	144	No	No	–40 to 105	QFP, BGA
ATSAMS70Q21	2048	144	No	No	–40 to 105	QFP, BGA

## Package Options

Package Description	Package Size	Pitch	Package Name
144-lead LQFP	20 x 20 mm	0.5 mm	144-pin LQFP
144-ball LFBGA	10 x 10 mm	0.8 mm	144-pin LFBGA
144-ball UFBGA	6 x 6 mm	0.4 mm	144-pin UFBGA
100-lead LQFP	14 x 14 mm	0.5 mm	100-pin LQFP
100-ball TFBGA	9 x 9 mm	0.8 mm	100-pin TFBGA
100-ball VFBGA	7 x 7 mm	0.65 mm	100-pin VFBGA
64-lead LQFP	10 x 10 mm	0.5 mm	64-pin LQFP
64-pad QFN	9 x 9 mm	0.5 mm	64-pin QFN*

\*QFN with wettable Flanks

The Microchip name and logo and the Microchip logo are registered trademarks of Microchip Technology Incorporated in the U.S.A. and other countries. All other trademarks mentioned herein are property of their respective companies. © 2017, Microchip Technology Incorporated. All Rights Reserved. Printed in the U.S.A. 6/17  
DS60001427C