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# Atmel | SMART SAM DA1 Series

## Targeting Automotive Capacitive Buttons/Sliders/Wheels Applications

The Atmel® | SMART SAM DA1 series is the first within Atmel's ARM® Cortex®-M0+ based automotive qualified microcontroller family. The SAM DA1 offers superior capacitive touch hardware support by embedding the peripheral touch controller (PTC), enabling efficient button/slider/wheel and proximity-detection applications.

The series is qualified according to AEC-Q100 Grade 2 standard (-40 to +105°C ambient temperature).

### Key Highlights

#### Comprehensive Peripheral Set for Connectivity

- Up to six serial communication interfaces (SERCOM), each configurable to operate as USART/UART, I<sup>2</sup>C or SPI.
- USB 2.0 Full-Speed embedded host and device.
- One-channel Inter-IC sound interface (I<sup>2</sup>S).

#### High Analog Performance

- 12-bit 350ksp/s analog-to-digital converter (ADC) with up to 20 channels, programmable gain stage, oversampling and decimation in hardware to support up to 16-bit resolution
- 10-bit, 350ksp/s digital-to-analog converter (DAC)
- Two analog comparators (ACs) with window-compare function

#### State-of-the-art Touch Support

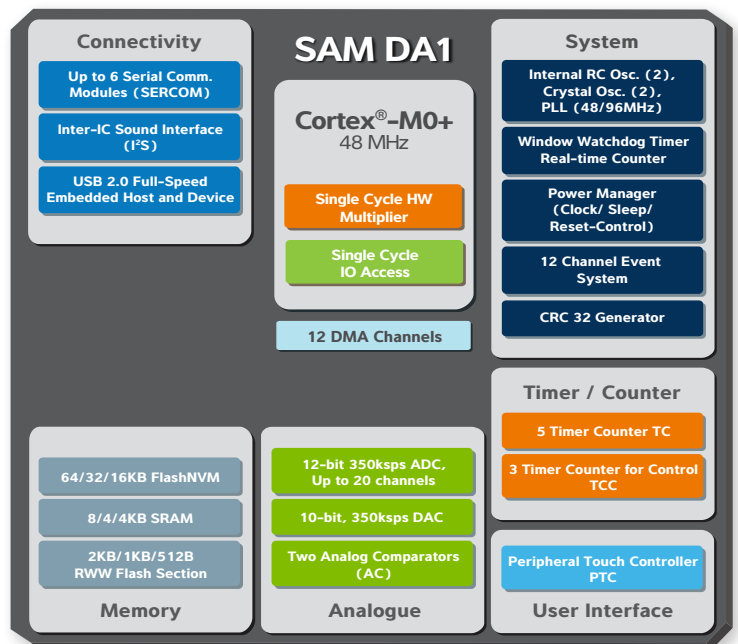
- The SAM DA1 embeds the peripheral touch controller with up to 256 channels enabling high-sensitivity, environmentally robust capacitive touch solutions by auto calibration/compensation and Hardware noise filtering.

#### Excellent Real-time Behavior

- 12-channel event-system, DMA System and single-cycle I/O access

### Key Applications

- Automotive capacitive-touch HMI with or without haptic or acoustic feedback
- Proximity detection
- Switch modules
- Rain/light sensors





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### Ecosystem

- Atmel Studio Integrated development environment (IDE) for developing and debugging: [www.atmel.com/studio](http://www.atmel.com/studio)
- Atmel software framework: Software library providing a large collection of embedded software for Atmel Flash MCUs: [www.atmel.com/asf](http://www.atmel.com/asf)
- Third-Party LIN software stack by ihr GmbH: [www.ihr.de/ihr/index.php?lang=en](http://www.ihr.de/ihr/index.php?lang=en)

To evaluate and prototype your application, Atmel provides a Xplained Pro evaluation kit: **ATSAMDA1-XPRO**.

### SAM DA1 Selector Guide

Ordering Code SAM DA1	FLASH (bytes)	SRAM (bytes)	Package	Temperature Grade	Touch, USB, I <sup>2</sup> S
ATSAMDA1E14A-ABT	16K	4K	TQFP32	-40°C to +105°C	Yes
ATSAMDA1E14A-MBT	16K	4K	QFN32	-40°C to +105°C	Yes
ATSAMDA1E15A-ABT	32K	4K	TQFP32	-40°C to +105°C	Yes
ATSAMDA1E15A-MBT	32K	4K	QFN32	-40°C to +105°C	Yes
ATSAMDA1E16A-ABT	64K	8K	TQFP32	-40°C to +105°C	Yes
ATSAMDA1E16A-MBT	64K	8K	QFN32	-40°C to +105°C	Yes
ATSAMDA1G14A-ABT	16K	4K	TQFP48	-40°C to +105°C	Yes
ATSAMDA1G14A-MBT	16K	4K	QFN48	-40°C to +105°C	Yes
ATSAMDA1G15A-ABT	32K	4K	TQFP48	-40°C to +105°C	Yes
ATSAMDA1G15A-MBT	32K	4K	QFN48	-40°C to +105°C	Yes
ATSAMDA1G16A-ABT	64K	8K	TQFP48	-40°C to +105°C	Yes
ATSAMDA1G16A-MBT	64K	8K	QFN48	-40°C to +105°C	Yes
ATSAMDA1J14A-ABT	16K	4K	TQFP64	-40°C to +105°C	Yes
ATSAMDA1J15A-ABT	32K	4K	TQFP64	-40°C to +105°C	Yes
ATSAMDA1J16A-ABT	64K	8K	TQFP64	-40°C to +105°C	Yes

For more information on the SAM DA1 series, go to [http://www.atmel.com/products/automotive/automotive\\_microcontrollers/default.aspx](http://www.atmel.com/products/automotive/automotive_microcontrollers/default.aspx)



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