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**32-bit ARM-Based Microcontrollers**

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**Introduction**

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The SAM DA1 is a series of low-power microcontrollers using the 32-bit ARM<sup>®</sup> Cortex<sup>®</sup>-M0+ processor, and ranging from 32- to 64-pins with up to 64KB Flash, 8KB of SRAM and up to 2KB Read-While-Write (RWW) Flash section. The SAM DA1 operate at a maximum frequency of 48MHz and reach 2.46 CoreMark<sup>®</sup>/MHz. They are designed for simple and intuitive migration with identical peripheral modules, hex compatible code, identical linear address map and pin compatible migration paths between all devices in the product series. All devices include intelligent and flexible peripherals, Event System for inter-peripheral signaling, and support for capacitive touch button, slider and wheel user interfaces.

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**Features**

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- Processor
  - ARM Cortex-M0+ CPU running at up to 48MHz
    - Single-cycle hardware multiplier
    - Micro Trace Buffer (MTB)
- Memories
  - 16/32/64KB in-system self-programmable Flash
  - 0.5/1/2KB Read-While-Write (RWW) Flash section
  - 4/4/8KB SRAM memory
- System
  - Power-on reset (POR) and brown-out detection (BOD)
  - Internal and external clock options with 48MHz Digital Frequency Locked Loop (DFLL48M) and 48MHz to 96MHz Fractional Digital Phase Locked Loop (FDPLL96M)
  - External Interrupt Controller (EIC)
  - 16 external interrupts
  - One non-maskable interrupt
  - Two-pin Serial Wire Debug (SWD) programming, test and debugging interface
- Low Power
  - Idle and standby sleep modes
  - SleepWalking peripherals
- Peripherals
  - 12-channel Direct Memory Access Controller (DMAC)
  - 12-channel Event System
  - Up to five 16-bit Timer/Counters (TC), configurable as either:
    - One 16-bit TC with two compare/capture channels
    - One 8-bit TC with two compare/capture channels
    - One 32-bit TC with two compare/capture channels, by using two TCs

- Three 24-bit Timer/Counters for Control (TCC), with extended functions:
  - Up to four compare channels with optional complementary output
  - Generation of synchronized pulse width modulation (PWM) pattern across port pins
  - Deterministic fault protection, fast decay and configurable dead-time between complementary output
  - Dithering that increase resolution with up to 5 bit and reduce quantization error
- 32-bit Real Time Counter (RTC) with clock/calendar function
- Watchdog Timer (WDT)
- CRC-32 generator
- One full-speed (12Mbps) Universal Serial Bus (USB) 2.0 interface controller
  - Device 2.0 and reduced-host low speed and full speed
  - Flexible end-point configuration and management with dedicated DMA channels
  - On-chip transceivers including pull-ups and serial resistors
  - Crystal-less operation in device mode
- Up to six Serial Communication Interfaces (SERCOM), each configurable to operate as either:
  - USART with full-duplex and single-wire half-duplex configuration
  - I<sup>2</sup>C up to 3.4MHz
  - SPI
- One two-channel Inter-IC Sound (I<sup>2</sup>S) interface
- One 12-bit, 350ksps Analog-to-Digital Converter (ADC) with up to 20 channels
  - Differential and single-ended input
  - 1/2x to 16x programmable gain stage
  - Automatic offset and gain error compensation
  - Oversampling and decimation in hardware to support 13-, 14-, 15- or 16-bit resolution
- 10-bit, 350ksps Digital-to-Analog Converter (DAC)
- Two Analog Comparators (AC) with window compare function
- Peripheral Touch Controller (PTC)
  - 256-Channel capacitive touch and proximity sensing
- I/O
  - Up to 52 programmable I/O pins
- Packages
  - 64-pin TQFP
  - 48-pin TQFP, QFN
  - 32-pin TQFP, QFN
- Operating Voltage
  - 2.7V - 3.63V
- Temperature range
  - -40°C to +105°C

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## 1. Description

The SAM DA1 is a series of low-power microcontrollers using the 32-bit ARM<sup>®</sup> Cortex<sup>®</sup>-M0+ processor, and ranging from 32- to 64-pins with up to 64KB Flash, 8KB of SRAM and up to 2KB Read-While-Write (RWW) Flash section. The SAM DA1 operate at a maximum frequency of 48MHz and reach 2.46 CoreMark/MHz. They are designed for simple and intuitive migration with identical peripheral modules, hex compatible code, identical linear address map and pin compatible migration paths between all devices in the product series. All devices include intelligent and flexible peripherals, Event System for inter-peripheral signaling, and support for capacitive touch button, slider and wheel user interfaces.

The SAM DA1 provide the following features: In-system programmable Flash, 12-channel direct memory access (DMA) controller, 12-channel Event System, programmable interrupt controller, up to 52 programmable I/O pins, 32-bit real-time clock and calendar, up to five 16-bit Timer/Counters (TC) and three 24-bit Timer/Counters for Control (TCC), where each TC can be configured to perform frequency and waveform generation, accurate program execution timing or input capture with time and frequency measurement of digital signals. The TCs can operate in 8- or 16-bit mode, selected TCs can be cascaded to form a 32-bit TC, and three timer/counters have extended functions optimized for motor, lighting and other control applications. The series provide one full-speed USB 2.0 embedded host and device interface; up to six Serial Communication Modules (SERCOM) that each can be configured to act as an USART, UART, SPI, I<sup>2</sup>C up to 3.4MHz, SMBus, PMBus, and LIN slave; two-channel I<sup>2</sup>S interface; up to twenty-channel 350kps 12-bit ADC with programmable gain and optional oversampling and decimation supporting up to 16-bit resolution, one 10-bit 350kps DAC, two analog comparators with window mode, Peripheral Touch Controller supporting up to 256 buttons, sliders, wheels and proximity sensing; programmable Watchdog Timer, brown-out detector and power-on reset and two-pin Serial Wire Debug (SWD) program and debug interface.

All devices have accurate and low-power external and internal oscillators. All oscillators can be used as a source for the system clock. Different clock domains can be independently configured to run at different frequencies, enabling power saving by running each peripheral at its optimal clock frequency, and thus maintaining a high CPU frequency while reducing power consumption.

The SAM DA1 have two software-selectable sleep modes, idle and standby. In idle mode the CPU is stopped while all other functions can be kept running. In standby all clocks and functions are stopped except those selected to continue running. The device supports SleepWalking. This feature allows the peripheral to wake up from sleep based on predefined conditions, and thus allows the CPU to wake up only when needed, e.g. when a threshold is crossed or a result is ready. The Event System supports synchronous and asynchronous events, allowing peripherals to receive, react to and send events even in standby mode.

The Flash program memory can be reprogrammed in-system through the SWD interface. The same interface can be used for non-intrusive on-chip debug of application code. A boot loader running in the device can use any communication interface to download and upgrade the application program in the Flash memory.

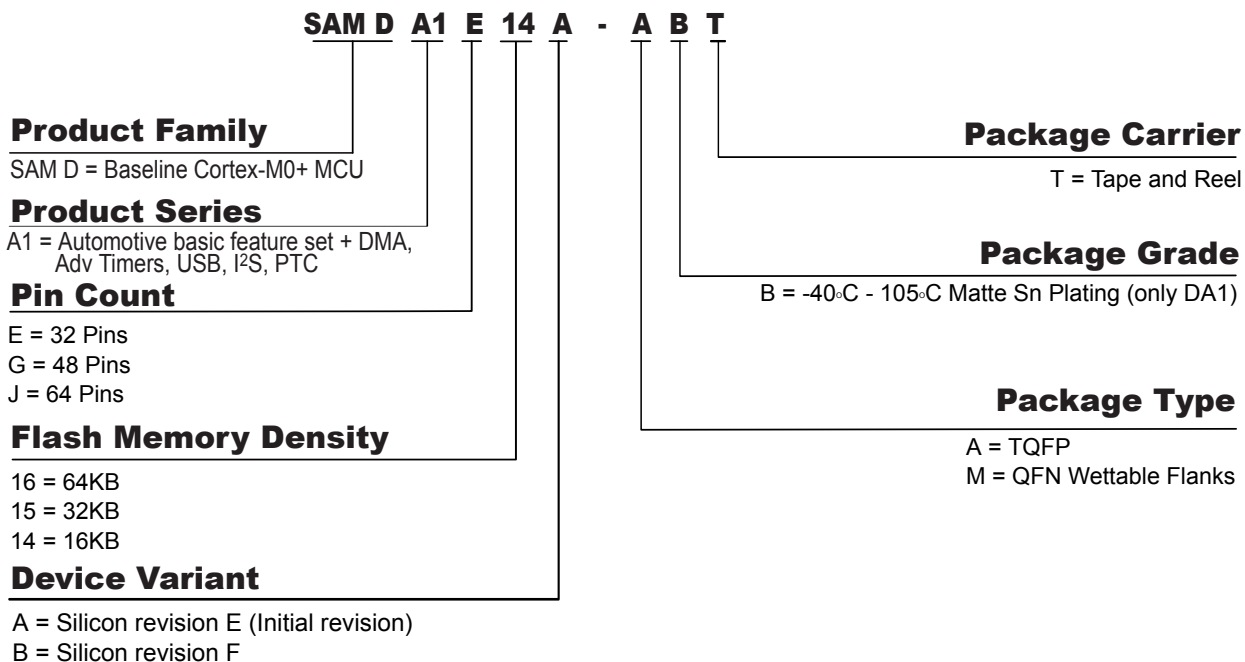
The SAM DA1 microcontrollers are supported with a full suite of program and system development tools, including C compilers, macro assemblers, program debugger/simulators, programmers and evaluation kits.

## 2. Configuration Summary

	SAM DA1J	SAM DA1G	SAM DA1E
Pins	64	48	32
General Purpose I/O-pins (GPIOs)	52	38	26
Flash	64/32/16KB	64/32/16KB	64/32/16KB
RWW Flash section	2KB/1KB/512B	2KB/1KB/512B	2KB/1KB/512B
SRAM	8/4/4KB	8/4/4KB	8/4/4KB
Timer Counter (TC) instances	5	3	3
Waveform output channels per TC instance	2	2	2
Timer Counter for Control (TCC) instances	3	3	3
Waveform output channels per TCC	8/4/2	8/4/2	6/4/2
DMA channels	12	12	12
USB interface	1	1	1
Serial Communication Interface (SERCOM) instances	6	6	4
Inter-IC Sound (I <sup>2</sup> S) interface	1	1	1
Analog-to-Digital Converter (ADC) channels	20	14	10
Analog Comparators (AC)	2	2	2
Digital-to-Analog Converter (DAC) channels	1	1	1
Real-Time Counter (RTC)	Yes	Yes	Yes
RTC alarms	1	1	1
RTC compare values	One 32-bit value or two 16-bit values	One 32-bit value or two 16-bit values	One 32-bit value or two 16-bit values
External Interrupt lines	16	16	16
Peripheral Touch Controller (PTC) X and Y lines	16x16	12x10	10x6
Maximum CPU frequency	48MHz		

	SAM DA1J	SAM DA1G	SAM DA1E
Packages	TQFP	QFN TQFP	QFN TQFP
Oscillators	32.768kHz crystal oscillator (XOSC32K) 0.4-32MHz crystal oscillator (XOSC) 32.768kHz internal oscillator (OSC32K) 32KHz ultra-low-power internal oscillator (OSCULP32K) 8MHz high-accuracy internal oscillator (OSC8M) 48MHz Digital Frequency Locked Loop (DFLL48M) 96MHz Fractional Digital Phased Locked Loop (FDPLL96M)		
Event System channels	12	12	12
SW Debug Interface	Yes	Yes	Yes
Watchdog Timer (WDT)	Yes	Yes	Yes

### 3. Ordering Information



#### 3.1 Device Variant A

##### 3.1.1 SAM DA1E

Ordering Code	Flash (Bytes)	SRAM (Bytes)	Package	Carrier Type	Temp. Grade	PTC, USB, I <sup>2</sup> S
ATSAMDA1E 14A-ABT <sup>(1)</sup>	16K	4K	TQFP32	Tape and Reel	-40°C to +105°C	Yes
ATSAMDA1E 14A-MBT <sup>(1)</sup>	16K	4K	QFN32	Tape and Reel	-40°C to +105°C	Yes
ATSAMDA1E 15A-ABT <sup>(1)</sup>	32K	4K	TQFP32	Tape and Reel	-40°C to +105°C	Yes
ATSAMDA1E 15A-MBT <sup>(1)</sup>	32K	4K	QFN32	Tape and Reel	-40°C to +105°C	Yes
ATSAMDA1E 16A-ABT <sup>(1)</sup>	64K	8K	TQFP32	Tape and Reel	-40°C to +105°C	Yes
ATSAMDA1E 16A-MBT <sup>(1)</sup>	64K	8K	QFN32	Tape and Reel	-40°C to +105°C	Yes

1. Contact your local sales representative for availability.



## 3.1.2 SAM DA1G

Ordering Code	Flash (Bytes)	SRAM (Bytes)	Package	Carrier Type	Temp. Grade	PTC, USB, I <sup>2</sup> S
ATSAMDA1 G14A-ABT <sup>(1)</sup>	16K	4K	TQFP48	Tape and Reel	-40°C to +105°C	Yes
ATSAMDA1 G14A-MBT <sup>(1)</sup>	16K	4K	QFN48	Tape and Reel	-40°C to +105°C	Yes
ATSAMDA1 G15A-ABT <sup>(1)</sup>	32K	4K	TQFP48	Tape and Reel	-40°C to +105°C	Yes
ATSAMDA1 G15A-MBT <sup>(1)</sup>	32K	4K	QFN48	Tape and Reel	-40°C to +105°C	Yes
ATSAMDA1 G16A-ABT <sup>(1)</sup>	64K	8K	TQFP48	Tape and Reel	-40°C to +105°C	Yes
ATSAMDA1 G16A-MBT <sup>(1)</sup>	64K	8K	QFN48	Tape and Reel	-40°C to +105°C	Yes

1. Contact your local sales representative for availability.

## 3.1.3 SAM DA1J

Ordering Code	Flash (Bytes)	SRAM (Bytes)	Package	Carrier Type	Temp. Grade	PTC, USB, I <sup>2</sup> S
ATSAMDA1J 14A-ABT <sup>(1)</sup>	16K	4K	TQFP64	Tape and Reel	-40°C to +105°C	Yes
ATSAMDA1J 15A-ABT <sup>(1)</sup>	32K	4K	TQFP64	Tape and Reel	-40°C to +105°C	Yes
ATSAMDA1J 16A-ABT <sup>(1)</sup>	64K	8K	TQFP64	Tape and Reel	-40°C to +105°C	Yes

1. Contact your local sales representative for availability.

## 3.2 Device Variant B

### 3.2.1 SAM DA1E

Ordering Code	Flash (Bytes)	SRAM (Bytes)	Package	Carrier Type	Temp. Grade	PTC, USB, I <sup>2</sup> S
ATSAMDA1E 14B-ABT <sup>(1)</sup>	16K	4K	TQFP32	Tape and Reel	-40°C to +105°C	Yes
ATSAMDA1E 14B-MBT <sup>(1)</sup>	16K	4K	QFN32	Tape and Reel	-40°C to +105°C	Yes
ATSAMDA1E 15B-ABT <sup>(1)</sup>	32K	4K	TQFP32	Tape and Reel	-40°C to +105°C	Yes

Ordering Code	Flash (Bytes)	SRAM (Bytes)	Package	Carrier Type	Temp. Grade	PTC, USB, I <sup>2</sup> S
ATSAMDA1E 15B-MBT <sup>(1)</sup>	32K	4K	QFN32	Tape and Reel	-40°C to +105°C	Yes
ATSAMDA1E 16B-ABT <sup>(1)</sup>	64K	8K	TQFP32	Tape and Reel	-40°C to +105°C	Yes
ATSAMDA1E 16B-MBT <sup>(1)</sup>	64K	8K	QFN32	Tape and Reel	-40°C to +105°C	Yes

1. Contact your local sales representative for availability.

### 3.2.2 SAM DA1G

Ordering Code	Flash (Bytes)	SRAM (Bytes)	Package	Carrier Type	Temp. Grade	PTC, USB, I <sup>2</sup> S
ATSAMDA1 G14B-ABT <sup>(1)</sup>	16K	4K	TQFP48	Tape and Reel	-40°C to +105°C	Yes
ATSAMDA1 G14B-MBT <sup>(1)</sup>	16K	4K	QFN48	Tape and Reel	-40°C to +105°C	Yes
ATSAMDA1 G15B-ABT <sup>(1)</sup>	32K	4K	TQFP48	Tape and Reel	-40°C to +105°C	Yes
ATSAMDA1 G15B-MBT <sup>(1)</sup>	32K	4K	QFN48	Tape and Reel	-40°C to +105°C	Yes
ATSAMDA1 G16B-ABT <sup>(1)</sup>	64K	8K	TQFP48	Tape and Reel	-40°C to +105°C	Yes
ATSAMDA1 G16B-MBT <sup>(1)</sup>	64K	8K	QFN48	Tape and Reel	-40°C to +105°C	Yes

1. Contact your local sales representative for availability.

### 3.2.3 SAM DA1J

Ordering Code	Flash (Bytes)	SRAM (Bytes)	Package	Carrier Type	Temp. Grade	PTC, USB, I <sup>2</sup> S
ATSAMDA1J 14B-ABT <sup>(1)</sup>	16K	4K	TQFP64	Tape and Reel	-40°C to +105°C	Yes
ATSAMDA1J 15B-ABT <sup>(1)</sup>	32K	4K	TQFP64	Tape and Reel	-40°C to +105°C	Yes
ATSAMDA1J 16B-ABT <sup>(1)</sup>	64K	8K	TQFP64	Tape and Reel	-40°C to +105°C	Yes

1. Contact your local sales representative for availability.

## 3.3 Device Identification

The DSU - Device Service Unit peripheral provides the Device Selection bits in the Device Identification register (DID.DEVSEL) in order to identify the device by software. The SAM DA1 variants have a reset value of DID=0x1001drxx, with the LSB identifying the die number ('d'), the die revision ('r') and the device selection ('xx').

**Table 3-1. SAM DA1 Device Identification Values**

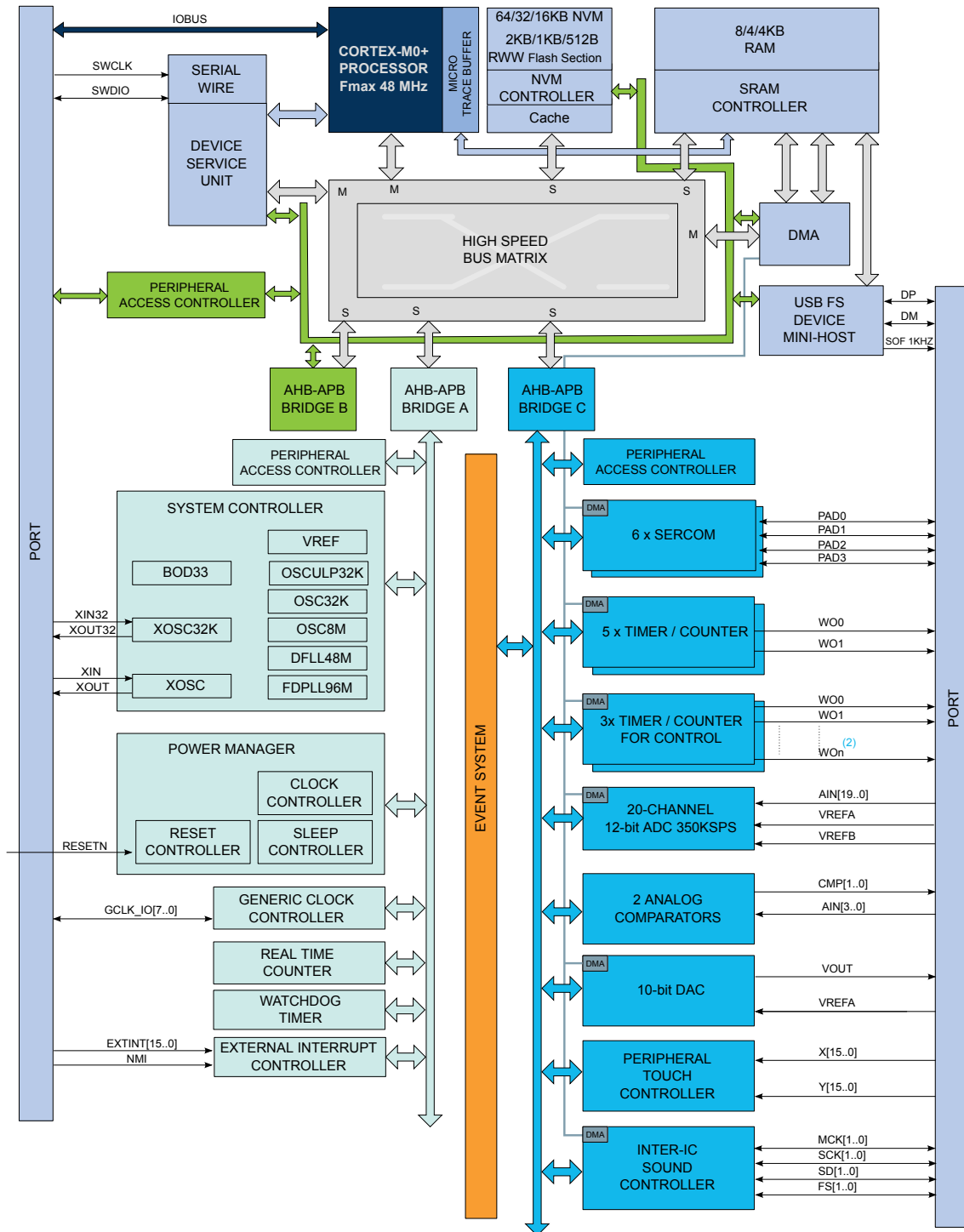
Device Variant	DID.DEVSEL	Device ID (DID)
Reserved	0x00 - 0x28	
SAMDA1J16A	0x29	0x10011429
SAMDA1J15A	0x2A	0x1001142A
SAMDA1J14A	0x2B	0x1001142B
SAMDA1G16A	0x2C	0x1001142C
SAMDA1G15A	0x2D	0x1001142D
SAMDA1G14A	0x2E	0x1001142D
SAMDA1E16A	0x2F	0x1001142F
SAMDA1E15A	0x30	0x10011430
SAMDA1E14A	0x31	0x10011431
Reserved	0x32 - 0x63	
SAMDA1J16B	0x64	0x10011564
SAMDA1J15B	0x65	0x10011565
SAMDA1J14B	0x66	0x10011566
SAMDA1G16B	0x67	0x10011567
SAMDA1G15B	0x68	0x10011568
SAMDA1G14B	0x69	0x10011569
SAMDA1E16B	0x6A	0x1001156A
SAMDA1E15B	0x6B	0x1001156B
SAMDA1E14B	0x6C	0x1001156C
Reserved	0x6D - 0xFF	

**Note:** The device variant (last letter of the ordering number) is independent of the die revision (DSU.DID.REVISION): The device variant denotes functional differences, whereas the die revision marks evolution of the die. The device variant denotes functional differences, whereas the die revision marks evolution of the die.

### Related Links

[DID](#)

## 4. Block Diagram



1. Some products have different number of SERCOM instances, Timer/Counter instances, PTC signals and ADC signals. Refer to the Configuration Summary for details.

2. The three TCC instances have different configurations, including the number of Waveform Output (WO) lines. Refer to the TCC Configuration for details.

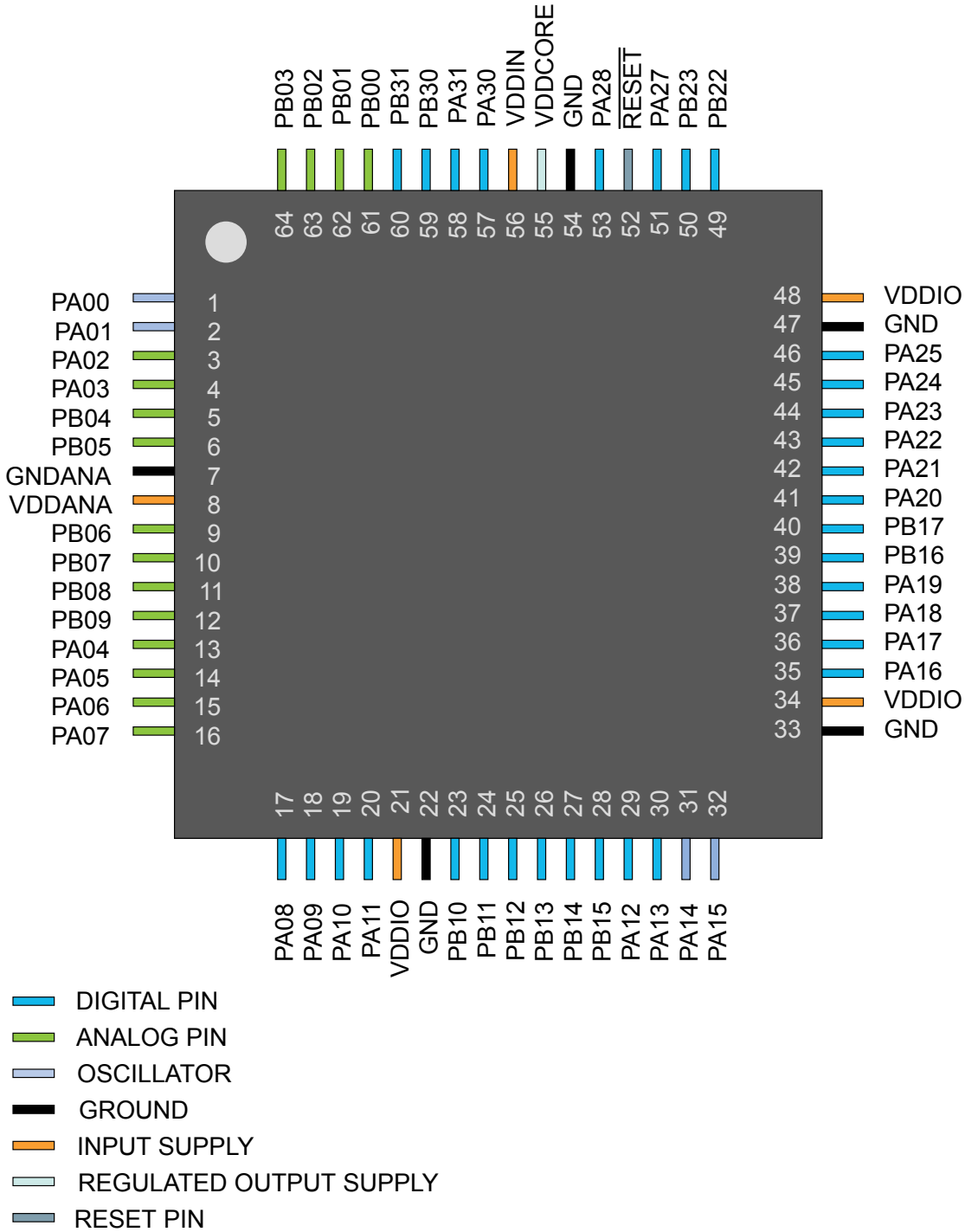
**Related Links**

[Configuration Summary](#)

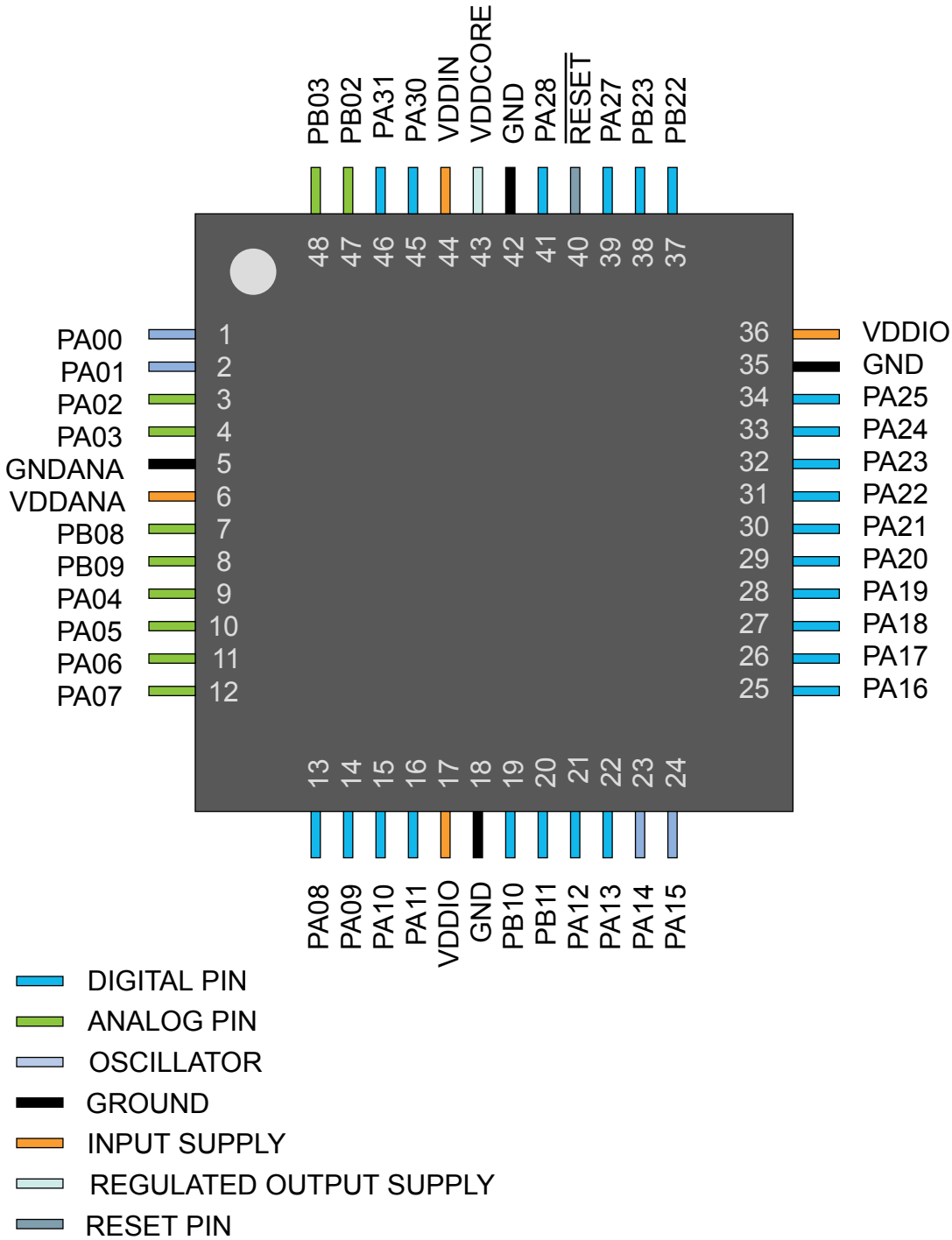
[TCC Configurations](#)

5. Pinout

5.1 SAM DA1J - TQFP64

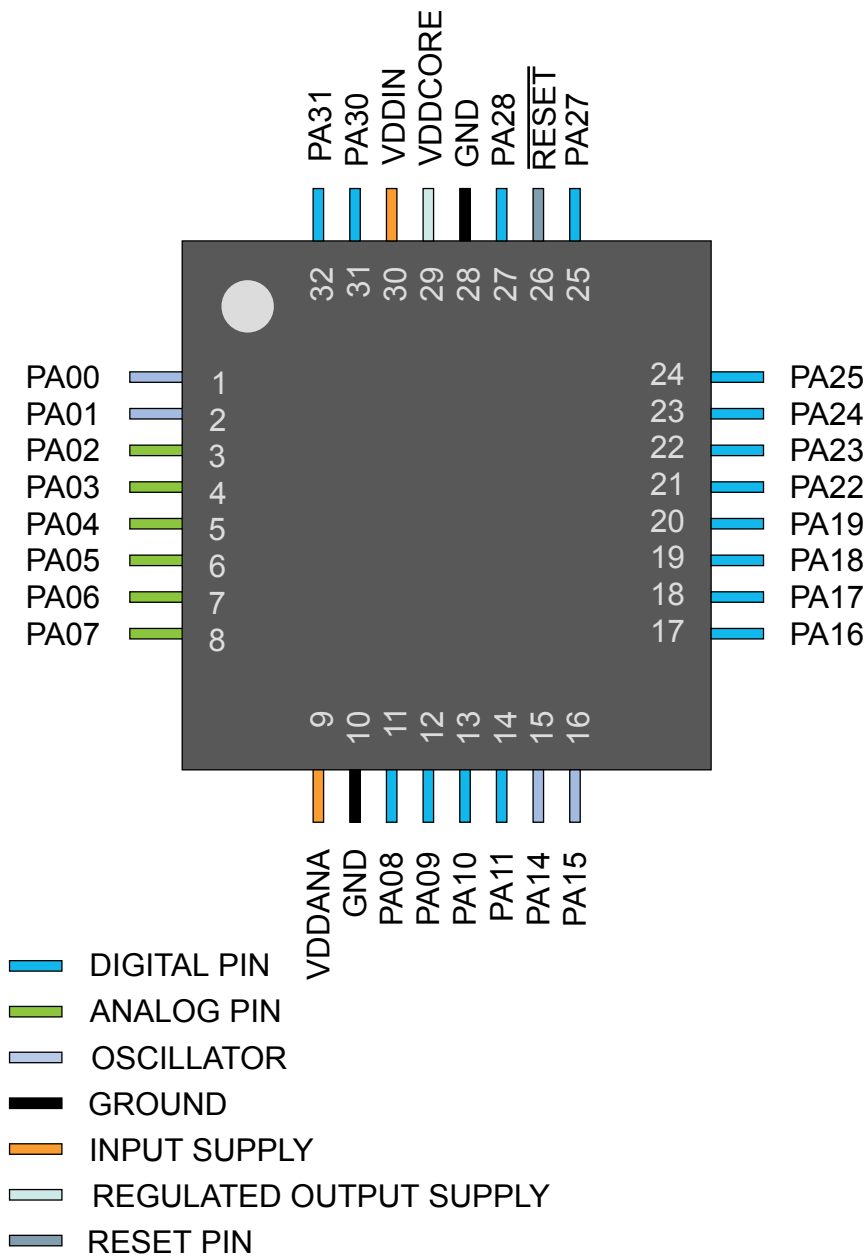


5.2 SAM DA1G - QFN48 / TQFP48





5.3 SAM DA1E - QFN32 / TQFP32



## 6. Signal Descriptions List

The following table gives details on signal names classified by peripheral.

Signal Name	Function	Type	Active Level
Analog Comparators - AC			
AIN[3:0]	AC Analog Inputs	Analog	
CMP[:0]	AC Comparator Outputs	Digital	
Analog Digital Converter - ADC			
AIN[19:0]	ADC Analog Inputs	Analog	
VREFA	ADC Voltage External Reference A	Analog	
VREFB	ADC Voltage External Reference B	Analog	
Digital Analog Converter - DAC			
VOUT	DAC Voltage output	Analog	
VREFA	DAC Voltage External Reference	Analog	
External Interrupt Controller			
EXTINT[15:0]	External Interrupts	Input	
NMI	External Non-Maskable Interrupt	Input	
Generic Clock Generator - GCLK			
GCLK_IO[7:0]	Generic Clock (source clock or generic clock generator output)	I/O	
Inter-IC Sound Controller - I2S			
MCK[1:0]	Master Clock	I/O	
SCK[1:0]	Serial Clock	I/O	
FS[1:0]	I2S Word Select or TDM Frame Sync	I/O	
SD[1:0]	Serial Data Input or Output	I/O	
Power Manager - PM			
RESETN	Reset	Input	Low
Serial Communication Interface - SERCOMx			
PAD[3:0]	SERCOM I/O Pads	I/O	
System Control - SYSCTRL			
XIN	Crystal Input	Analog/ Digital	
XIN32	32kHz Crystal Input	Analog/ Digital	
XOUT	Crystal Output	Analog	
XOUT32	32kHz Crystal Output	Analog	

Signal Name	Function	Type	Active Level
Timer Counter - TCx			
WO[1:0]	Waveform Outputs	Output	
Timer Counter - TCCx			
WO[1:0]	Waveform Outputs	Output	
Peripheral Touch Controller - PTC			
X[15:0]	PTC Input	Analog	
Y[15:0]	PTC Input	Analog	
General Purpose I/O - PORT			
PA25 - PA00	Parallel I/O Controller I/O Port A	I/O	
PA28 - PA27	Parallel I/O Controller I/O Port A	I/O	
PA31 - PA30	Parallel I/O Controller I/O Port A	I/O	
PB17 - PB00	Parallel I/O Controller I/O Port B	I/O	
PB23 - PB22	Parallel I/O Controller I/O Port B	I/O	
PB31 - PB30	Parallel I/O Controller I/O Port B	I/O	
Universal Serial Bus - USB			
DP	DP for USB	I/O	
DM	DM for USB	I/O	
SOF 1kHz	USB Start of Frame	I/O	

## 7. I/O Multiplexing and Considerations

### 7.1 Multiplexed Signals

Each pin is by default controlled by the PORT as a general purpose I/O and alternatively it can be assigned to one of the peripheral functions A, B, C, D, E, F, G or H. To enable a peripheral function on a pin, the Peripheral Multiplexer Enable bit in the Pin Configuration register corresponding to that pin (PINCFGn.PMUXEN, n = 0-31) in the PORT must be written to one. The selection of peripheral function A to H is done by writing to the Peripheral Multiplexing Odd and Even bits in the Peripheral Multiplexing register (PMUXn.PMUXE/O) in the PORT.

This table describes the peripheral signals multiplexed to the PORT I/O pins.

**Table 7-1. PORT Function Multiplexing**

Pin			I/O Pin	Supply	A	B <sup>(1)(2)</sup>					C	D	E	F	G	H
SAMDA1E	SAMDA1G	SAMDA1J			EIC	REF	ADC	AC	PTC	DAC	SERCOM <sup>(1)(2)</sup>	SERCOM-ALT	Tc <sup>(3)</sup> /TCC	TCC	COM	AC/ GCLK
1	1	1	PA00	VDDANA	EXTINT[0]							SERCOM1/ PAD[0]	TCC2/WO[0]			
2	2	2	PA01	VDDANA	EXTINT[1]							SERCOM1/ PAD[1]	TCC2/WO[1]			
3	3	3	PA02	VDDANA	EXTINT[2]		AIN[0]		Y[0]	VOUT						
4	4	4	PA03	VDDANA	EXTINT[3]	ADC/ VREFA DAC/ VREFA	AIN[1]		Y[1]							
		5	PB04	VDDANA	EXTINT[4]		AIN[12]		Y[10]							
		6	PB05	VDDANA	EXTINT[5]		AIN[13]		Y[11]							
		9	PB06	VDDANA	EXTINT[6]		AIN[14]		Y[12]							
		10	PB07	VDDANA	EXTINT[7]		AIN[15]		Y[13]							
	7	11	PB08	VDDANA	EXTINT[8]		AIN[2]		Y[14]			SERCOM4/ PAD[0]	TC4/WO[0]			
	8	12	PB09	VDDANA	EXTINT[9]		AIN[3]		Y[15]			SERCOM4/ PAD[1]	TC4/WO[1]			
5	9	13	PA04	VDDANA	EXTINT[4]	ADC/ VREFB	AIN[4]	AIN[0]	Y[2]			SERCOM0/ PAD[0]	TCC0/WO[0]			
6	10	14	PA05	VDDANA	EXTINT[5]		AIN[5]	AIN[1]	Y[3]			SERCOM0/ PAD[1]	TCC0/WO[1]			
7	11	15	PA06	VDDANA	EXTINT[6]		AIN[6]	AIN[2]	Y[4]			SERCOM0/ PAD[2]	TCC1/WO[0]			
8	12	16	PA07	VDDANA	EXTINT[7]		AIN[7]	AIN[3]	Y[5]			SERCOM0/ PAD[3]	TCC1/WO[1]		I2S/SD[0]	
11	13	17	PA08	VDDIO	NMI		AIN[16]		X[0]		SERCOM0/ PAD[0]	SERCOM2/ PAD[0]	TCC0/WO[0]	TCC1/ WO[2]	I2S/SD[1]	
12	14	18	PA09	VDDIO	EXTINT[9]		AIN[17]		X[1]		SERCOM0/ PAD[1]	SERCOM2/ PAD[1]	TCC0/WO[1]	TCC1/ WO[3]	I2S/ MCK[0]	
13	15	19	PA10	VDDIO	EXTINT[10]		AIN[18]		X[2]		SERCOM0/ PAD[2]	SERCOM2/ PAD[2]	TCC1/WO[0]	TCC0/ WO[2]	I2S/ SCK[0]	GCLK_IO[4]
14	16	20	PA11	VDDIO	EXTINT[11]		AIN[19]		X[3]		SERCOM0/ PAD[3]	SERCOM2/ PAD[3]	TCC1/WO[1]	TCC0/ WO[3]	I2S/FS[0]	GCLK_IO[5]
		19	PB10	VDDIO	EXTINT[10]							SERCOM4/ PAD[2]	TC5/WO[0]	TCC0/ WO[4]	I2S/ MCK[1]	GCLK_IO[4]
		20	PB11	VDDIO	EXTINT[11]							SERCOM4/ PAD[3]	TC5/WO[1]	TCC0/ WO[5]	I2S/ SCK[1]	GCLK_IO[5]
		25	PB12	VDDIO	EXTINT[12]				X[12]		SERCOM4/ PAD[0]		TC4/WO[0]	TCC0/ WO[6]	I2S/FS[1]	GCLK_IO[6]
		26	PB13	VDDIO	EXTINT[13]				X[13]		SERCOM4/ PAD[1]		TC4/WO[1]	TCC0/ WO[7]		GCLK_IO[7]
		27	PB14	VDDIO	EXTINT[14]				X[14]		SERCOM4/ PAD[2]		TC5/WO[0]			GCLK_IO[0]