



Product Change Notification - SYST-07FJOF556

Date:

08 Aug 2019

Product Category:

32-bit Microcontrollers

Affected CPNs:**Notification subject:**

ERRATA - SAM D09 Series Family Silicon Errata and Data Sheet Clarifications

Notification text:

SYST-07FJOF556

Microchip has released a new DeviceDoc for the SAM D09 Series Family Silicon Errata and Data Sheet Clarifications of devices. If you are using one of these devices please read the document located at [SAM D09 Series Family Silicon Errata and Data Sheet Clarifications](#).

Notification Status: Final

Description of Change:

1) This is the initial released version of this document.

Impacts to Data Sheet: None

Reason for Change: To Improve Productivity

Change Implementation Status: Complete

Date Document Changes Effective: 08 Aug 2019

NOTE: Please be advised that this is a change to the document only the product has not been changed.

Markings to Distinguish Revised from Unrevised Devices: N/A

Attachment(s):

[SAM D09 Series Family Silicon Errata and Data Sheet Clarifications](#)

Please contact your local [Microchip sales office](#) with questions or concerns regarding this notification.

Terms and Conditions:

If you wish to receive Microchip PCNs via email please register for our PCN email service at our [PCN home page](#) select register then fill in the required fields. You will find instructions about registering for Microchips PCN email service in the [PCN FAQ](#) section.

If you wish to change your PCN profile, including opt out, please go to the [PCN home page](#) select login and sign into your myMicrochip account. Select a profile option from the left navigation bar and make the applicable selections.

Affected Catalog Part Numbers (CPN)

ATSAMD09C13A-SSUT

ATSAMD09D14A-MUT

SAM D09 Series Family Silicon Errata and Data Sheet Clarification

The SAM D09 Series family of devices that you have received conform functionally to the current Device Data Sheet (Atmel-42414G-SAM-D09-Datasheet_09/2016), except for the anomalies described in this document.

New Silicon Errata Issues

Note: This document provides information on new errata issues for the SAM D09 Series of devices. Please refer to the current device data sheet for all pre-existing silicon errata issues.

1. Module: BOD12

On External Reset, the BOD12 reset cause can also be triggered.

Work around

Ignore BOD12 reset cause if External reset cause is set.

Affected Silicon Revisions

A	B						
X							

SAM D09 SERIES

Data Sheet Clarifications

The following typographic corrections and clarifications are to be noted for the latest version of the Device Data Sheet (Atmel-42414G-SAM-D09-Datasheet_09/2016).

Note: Corrections in tables and paragraphs are shown in **bold**. Where possible, the original bold text formatting has been removed for clarity.

1. Module: Package Marking Information

In the current device data sheet, the SAM D09 Package Marking Information is missing. The information is as follows:

All devices are marked with the Atmel logo, a shortened ordering code and additional marking (the two last lines).

YYWW R ARM
XXXXXX CC

Where:

- "Y" or "YY": Manufacturing Year (last OR two last digit(s))
- "WW": Manufacturing Week
- "R": Revision
- "XXXXXX": Lot number
- "CC": Internal Code

2. Module: XOSC32 EN1K bit

The EN1K bit is referenced several times in the device data sheet. The EN1K bit is not implemented for this device.

3. Module: OSCULP32K Characteristics

The value for the minimum output frequency is incorrect. The corrected information is shown in bold below.

TABLE 30-39: ULTRA-LOW POWER INTERNAL 32 kHz RC OSCILLATOR CHARACTERISTICS

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
f _{OUT}	Output frequency	Calibrated against a 32.768 kHz reference at 25°C, over [-40, +85]C, over [1.62, 3.63]V	27.8	32.768	37.8	kHz
		Calibrated against a 32.768 kHz reference at 25°C, at V _{DD} =3.3V	32.5	32.768	32.8	
		Calibrated against a 32.768 kHz reference at 25°C, over [1.62, 3.63]V	31.9	32.768	33.1	
Duty	Duty Cycle			50		%

4. Module: Brown-out Detectors (BOD) Characteristics

Figure 30-3 and Figure 30-4 have an incorrect reset Polarity value. The corrected figures are as shown below:

FIGURE 30-3: BOD33 HYSTERESIS OFF

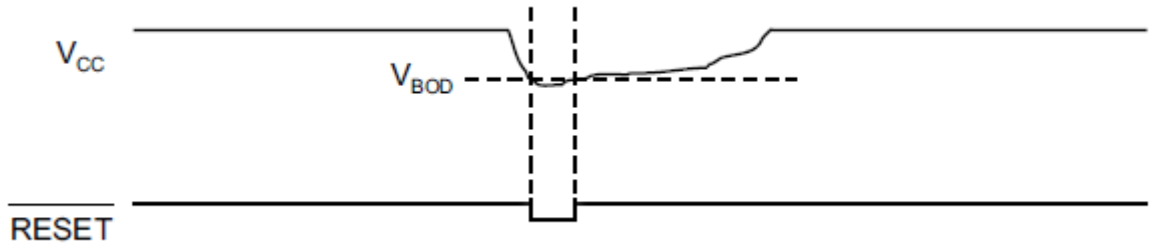
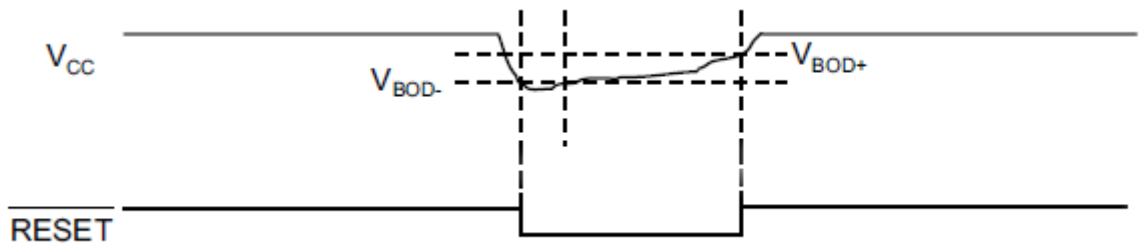


FIGURE 30-4: BOD33 LEVEL VALUE



5. Module: ADC Power Management

A new information has been added to the Section 29.5.2, and is shown in bold.

The ADC will continue to operate in any sleep modes where the selected source clock is running. The ADC's interrupts can be used to wake up the device from sleep modes (**Except the OVERRUN interrupt**). The events can trigger other operations in the system without exiting the sleep modes. Refer to "PM – Power Manager" on page 107 for details on the different sleep modes.

6. Module: EVSYS Register Summary

The USER register is displayed incorrectly in the Register Summary. The correct USER register summary section is displayed as follows:

0x0120	USER0	7:0					CHANNEL[3:0]			
...										
0x0136	USER22	7:0					CHANNEL [3:0]			

SAM D09 SERIES

7. Module: EVSYS Principle of Operation

Section 23.6.1 has some incorrect information in the second part, the corrected information is shown in bold.

The EVSYS allows for communication between peripherals via events. Peripherals that respond to events (event users) are connected to multiplexers which have all event channels as input. **Each peripheral emitting events (Event Generator) can be connected to one or multiple event users, using one or multiple channels of the Event System.**

8. Module: NVMCTRL - CTRLA Register

Table 21-6 for the Command bit displays Write Lockbits as a feature. Write lockbits are not supported on this device.

9. Module: NVMCTRL - NVM User Configuration

Table 21-2 and Table 21-3 show incorrect values on the last two rows of each table. These values are not possible per the device memory density.

10. Module: RTC - Overview

The overview section for the RTC has had a new verbiage, which has been highlighted in bold.

The Real-Time Counter (RTC) is a 32-bit counter with a 10-bit programmable prescaler that typically runs continuously to keep track of time. The RTC can wake up the device from sleep modes using the alarm/compare wake up, periodic wake up or overflow wake up mechanisms.

The RTC is clocked by any clock sources selectable through the Generic Clock module (GCLK), providing the signal GCLK_RTC.

The RTC can generate periodic peripheral events from outputs of the prescaler, as well as alarm/compare interrupts and peripheral events, which can trigger at any counter value. Additionally, the timer can trigger an overflow interrupt and peripheral event, and be reset on the occurrence of an alarm/compare match. This allows periodic interrupts and peripheral events at very long and accurate intervals.

The 10-bit programmable prescaler can scale down the clock source, and so a wide range of resolutions and time-out periods can be configured. With a 32.768 kHz clock source, the minimum counter tick interval is 30.5 μ s, and time-out periods can range up to 36 hours. With the counter tick interval configured to 1s, the maximum time-out period is more than 136 years.

11. Module: 32 kHz Internal Oscillator (OSC32K) Operation

The data sheet erroneously lists a 1.024 kHz output and the EN1K bit in section 16.6.4. These are not available for this device.

12. Module: 32 kHz External Crystal Oscillator (XOSC32K) Operation

The data sheet erroneously lists a 1.024 kHz output and the EN1K bit in the Section 16.6.3. These are not available for this device.

13. Module: SYSCCTRL - XOSC Register

The register description for the GAIN bit has been updated, and the newly added text is shown in bold.

These bits select the gain for the oscillator. The listed maximum frequencies are recommendations, and might vary based on capacitive load and crystal characteristics. **Those bits must be properly configured even when the Automatic Amplitude Gain Control is active.**

14. Module: SYSCCTRL - XOSC Register

The AMPGC bit has been updated with a new note, as shown in bold.

Note: The configuration of the oscillator gain is mandatory even if AMPGC feature is enabled at startup.

15. Module: 32kHz Ultra-Low Power Internal Oscillator (OSCULP32K) Operation

The data sheet erroneously lists a 1.024 kHz output in Section 16.6.5. The corrected text is shown in bold.

The OSCULP32K provides a tunable, low-speed and ultra-low power clock source. The OSCULP32K is factory calibrated under typical voltage and temperature conditions. The OSCULP32K should be preferred to the OSC32K whenever the power requirements are prevalent over frequency stability and accuracy.

The OSCULP32K can be used as a source for the generic clock generators, as described in the “GCLK – Generic Clock Controller” on page 85.

The OSCULP32K is enabled by default after a Power-on Reset (POR) and will always run except during POR. **The OSCULP32K has a 32.768 kHz output that is always running.**

16. Module: 32 kHz Internal Oscillator (OSC32K) Operation

The data sheet erroneously lists a 1.024 kHz output and the EN1K bit in section 16.6.4. These are not available for this device.

17. Module: 32 kHz External Crystal Oscillator (XOSC32K) Operation

The data sheet erroneously lists a 1.024 kHz output and the EN1K bit in section 16.6.3. These are not available for this device.

18. Module: Debug Operation - DCFGn Register

The register is erroneously listed as Read-Write. This register is Read Only.

SAM D09 SERIES

APPENDIX A: REVISION HISTORY

Revision A Document (07/2019)

This is the initial released version of this document.

Note the following details of the code protection feature on Microchip devices:

- Microchip products meet the specification contained in their particular Microchip Data Sheet.
- Microchip believes that its family of products is one of the most secure families of its kind on the market today, when used in the intended manner and under normal conditions.
- There are dishonest and possibly illegal methods used to breach the code protection feature. All of these methods, to our knowledge, require using the Microchip products in a manner outside the operating specifications contained in Microchip's Data Sheets. Most likely, the person doing so is engaged in theft of intellectual property.
- Microchip is willing to work with the customer who is concerned about the integrity of their code.
- Neither Microchip nor any other semiconductor manufacturer can guarantee the security of their code. Code protection does not mean that we are guaranteeing the product as "unbreakable."

Code protection is constantly evolving. We at Microchip are committed to continuously improving the code protection features of our products. Attempts to break Microchip's code protection feature may be a violation of the Digital Millennium Copyright Act. If such acts allow unauthorized access to your software or other copyrighted work, you may have a right to sue for relief under that Act.

Information contained in this publication regarding device applications and the like is provided only for your convenience and may be superseded by updates. It is your responsibility to ensure that your application meets with your specifications. MICROCHIP MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND WHETHER EXPRESS OR IMPLIED, WRITTEN OR ORAL, STATUTORY OR OTHERWISE, RELATED TO THE INFORMATION, INCLUDING BUT NOT LIMITED TO ITS CONDITION, QUALITY, PERFORMANCE, MERCHANTABILITY OR FITNESS FOR PURPOSE. Microchip disclaims all liability arising from this information and its use. Use of Microchip devices in life support and/or safety applications is entirely at the buyer's risk, and the buyer agrees to defend, indemnify and hold harmless Microchip from any and all damages, claims, suits, or expenses resulting from such use. No licenses are conveyed, implicitly or otherwise, under any Microchip intellectual property rights unless otherwise stated.

Trademarks

The Microchip name and logo, the Microchip logo, Adaptec, AnyRate, AVR, AVR logo, AVR Freaks, BesTime, BitCloud, chipKIT, chipKIT logo, CryptoMemory, CryptoRF, dsPIC, FlashFlex, flexPWR, HELDO, IGLOO, JukeBlox, KeeLoq, Klear, LANCheck, LinkMD, maXStylus, maXTouch, MediaLB, megaAVR, Microsemi, Microsemi logo, MOST, MOST logo, MPLAB, OptoLyzer, PackTime, PIC, picoPower, PICSTART, PIC32 logo, PolarFire, Prochip Designer, QTouch, SAM-BA, SenGenuity, SpyNIC, SST, SST Logo, SuperFlash, Symmetricom, SyncServer, Tachyon, TempTrackr, TimeSource, tinyAVR, UNI/O, Vectron, and XMEGA are registered trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

APT, ClockWorks, The Embedded Control Solutions Company, EtherSynch, FlashTec, Hyper Speed Control, HyperLight Load, IntelliMOS, Libero, motorBench, mTouch, Powermite 3, Precision Edge, ProASIC, ProASIC Plus, ProASIC Plus logo, Quiet-Wire, SmartFusion, SyncWorld, Temux, TimeCesium, TimeHub, TimePictra, TimeProvider, Vite, WinPath, and ZL are registered trademarks of Microchip Technology Incorporated in the U.S.A.

Adjacent Key Suppression, AKS, Analog-for-the-Digital Age, Any Capacitor, AnyIn, AnyOut, BlueSky, BodyCom, CodeGuard, CryptoAuthentication, CryptoAutomotive, CryptoCompanion, CryptoController, dsPICDEM, dsPICDEM.net, Dynamic Average Matching, DAM, ECAN, EtherGREEN, In-Circuit Serial Programming, ICSP, INICnet, Inter-Chip Connectivity, JitterBlocker, KlearNet, KlearNet logo, memBrain, Mindi, MiWi, MPASM, MPF, MPLAB Certified logo, MPLIB, MPLINK, MultiTRAK, NetDetach, Omniscient Code Generation, PICDEM, PICDEM.net, PICKit, PICtail, PowerSmart, PureSilicon, QMatrix, REAL ICE, Ripple Blocker, SAM-ICE, Serial Quad I/O, SMART-I.S., S QL, SuperSwitcher, SuperSwitcher II, Total Endurance, TSHARC, USBCheck, VariSense, ViewSpan, WiperLock, Wireless DNA, and ZENA are trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

SQTP is a service mark of Microchip Technology Incorporated in the U.S.A.

The Adaptec logo, Frequency on Demand, Silicon Storage Technology, and Symmcom are registered trademarks of Microchip Technology Inc. in other countries.

GestIC is a registered trademark of Microchip Technology Germany II GmbH & Co. KG, a subsidiary of Microchip Technology Inc., in other countries.

All other trademarks mentioned herein are property of their respective companies.

© 2019, Microchip Technology Incorporated, All Rights Reserved.

For information regarding Microchip's Quality Management Systems, please visit www.microchip.com/quality.

ISBN: 978-1-5224-4804-4

Worldwide Sales and Service

AMERICAS

Corporate Office
2355 West Chandler Blvd.
Chandler, AZ 85224-6199

Tel: 480-792-7200

Fax: 480-792-7277

Technical Support:

[http://www.microchip.com/
support](http://www.microchip.com/support)

Web Address:

www.microchip.com

Atlanta

Duluth, GA

Tel: 678-957-9614

Fax: 678-957-1455

Austin, TX

Tel: 512-257-3370

Boston

Westborough, MA

Tel: 774-760-0087

Fax: 774-760-0088

Chicago

Itasca, IL

Tel: 630-285-0071

Fax: 630-285-0075

Dallas

Addison, TX

Tel: 972-818-7423

Fax: 972-818-2924

Detroit

Novi, MI

Tel: 248-848-4000

Houston, TX

Tel: 281-894-5983

Indianapolis

Noblesville, IN

Tel: 317-773-8323

Fax: 317-773-5453

Tel: 317-536-2380

Los Angeles

Mission Viejo, CA

Tel: 949-462-9523

Fax: 949-462-9608

Tel: 951-273-7800

Raleigh, NC

Tel: 919-844-7510

New York, NY

Tel: 631-435-6000

San Jose, CA

Tel: 408-735-9110

Tel: 408-436-4270

Canada - Toronto

Tel: 905-695-1980

Fax: 905-695-2078

ASIA/PACIFIC

Australia - Sydney

Tel: 61-2-9868-6733

China - Beijing

Tel: 86-10-8569-7000

China - Chengdu

Tel: 86-28-8665-5511

China - Chongqing

Tel: 86-23-8980-9588

China - Dongguan

Tel: 86-769-8702-9880

China - Guangzhou

Tel: 86-20-8755-8029

China - Hangzhou

Tel: 86-571-8792-8115

China - Hong Kong SAR

Tel: 852-2943-5100

China - Nanjing

Tel: 86-25-8473-2460

China - Qingdao

Tel: 86-532-8502-7355

China - Shanghai

Tel: 86-21-3326-8000

China - Shenyang

Tel: 86-24-2334-2829

China - Shenzhen

Tel: 86-755-8864-2200

China - Suzhou

Tel: 86-186-6233-1526

China - Wuhan

Tel: 86-27-5980-5300

China - Xian

Tel: 86-29-8833-7252

China - Xiamen

Tel: 86-592-2388138

China - Zhuhai

Tel: 86-756-3210040

ASIA/PACIFIC

India - Bangalore

Tel: 91-80-3090-4444

India - New Delhi

Tel: 91-11-4160-8631

India - Pune

Tel: 91-20-4121-0141

Japan - Osaka

Tel: 81-6-6152-7160

Japan - Tokyo

Tel: 81-3-6880-3770

Korea - Daegu

Tel: 82-53-744-4301

Korea - Seoul

Tel: 82-2-554-7200

Malaysia - Kuala Lumpur

Tel: 60-3-7651-7906

Malaysia - Penang

Tel: 60-4-227-8870

Philippines - Manila

Tel: 63-2-634-9065

Singapore

Tel: 65-6334-8870

Taiwan - Hsin Chu

Tel: 886-3-577-8366

Taiwan - Kaohsiung

Tel: 886-7-213-7830

Taiwan - Taipei

Tel: 886-2-2508-8600

Thailand - Bangkok

Tel: 66-2-694-1351

Vietnam - Ho Chi Minh

Tel: 84-28-5448-2100

EUROPE

Austria - Wels

Tel: 43-7242-2244-39

Fax: 43-7242-2244-393

Denmark - Copenhagen

Tel: 45-4450-2828

Fax: 45-4485-2829

Finland - Espoo

Tel: 358-9-4520-820

France - Paris

Tel: 33-1-69-53-63-20

Fax: 33-1-69-30-90-79

Germany - Garching

Tel: 49-8931-9700

Germany - Haan

Tel: 49-2129-3766400

Germany - Heilbronn

Tel: 49-7131-72400

Germany - Karlsruhe

Tel: 49-721-625370

Germany - Munich

Tel: 49-89-627-144-0

Fax: 49-89-627-144-44

Germany - Rosenheim

Tel: 49-8031-354-560

Israel - Ra'anana

Tel: 972-9-744-7705

Italy - Milan

Tel: 39-0331-742611

Fax: 39-0331-466781

Italy - Padova

Tel: 39-049-7625286

Netherlands - Drunen

Tel: 31-416-690399

Fax: 31-416-690340

Norway - Trondheim

Tel: 47-7288-4388

Poland - Warsaw

Tel: 48-22-3325737

Romania - Bucharest

Tel: 40-21-407-87-50

Spain - Madrid

Tel: 34-91-708-08-90

Fax: 34-91-708-08-91

Sweden - Gothenberg

Tel: 46-31-704-60-40

Sweden - Stockholm

Tel: 46-8-5090-4654

UK - Wokingham

Tel: 44-118-921-5800

Fax: 44-118-921-5820