Product Change Notification / SYST-16EQYH046

Date:

17-Mar-2022

Product Category:

8-bit Microcontrollers

PCN Type:

Document Change

Notification Subject:

ERRATA - ATxmega128/64B3 Silicon Errata and Data Sheet Clarification Document Revision

Affected CPNs:

SYST-16EQYH046_Affected_CPN_03172022.pdf
SYST-16EQYH046_Affected_CPN_03172022.csv

Notification Text:

SYST-16EQYH046

Microchip has released a new Product Documents for the ATxmega128/64B3 Silicon Errata and Data Sheet Clarification of devices. If you are using one of these devices please read the document located at ATxmega128/64B3 Silicon Errata and Data Sheet Clarification.

Notification Status: Final

Description of Change:
Initial release of this document.
1) Content moved from the data sheet and restructured to the new document template
2) Added data sheet clarification section 3.2. ADC – 12-bit Analog to Digital Converter and added a note in 3.2.1. Overview

Impacts to Data Sheet: None

Reason for Change: To Improve Productivity

Change Implementation Status: Complete

Date Document Changes Effective: 17 Mar 2022

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

Attachments:

ATxmega128/64B3 Silicon Errata and Data Sheet Clarification

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Affected Catalog Part Numbers (CPN)

ATXMEGA128B3-AU
ATXMEGA128B3-AUR
ATXMEGA128B3-MCU
ATXMEGA128B3-MCUR
ATXMEGA128B3-MCURA0
ATXMEGA128B3-MH
ATXMEGA128B3-MHR
ATXMEGA64B3-AU
ATXMEGA64B3-AUR
ATXMEGA64B3-MH

ATxmega128/64B3

Silicon Errata and Data Sheet Clarification

Introduction

The ATxmega128/64B3 devices you have received conform functionally to the current device data sheet (https://ww1.microchip.com/downloads/en/DeviceDoc/Atmel-8074-8-and-16-bit-AVR-Microcontroller-XMEGA-B-ATxmega64B3-ATxmega128B3_Datasheet.pdf), except for the anomalies described in this document. The errata described in this document will likely be addressed in future revisions of the ATxmega128/64B3 devices.

Note:

- This document summarizes all the silicon errata issues from all revisions of silicon, previous and current.

1. Silicon Issue Summary

Legend

- **-** Erratum is not applicable.
- **X** Erratum is applicable.

Peripheral	Short Description	Valid for Silicon Revision	
		ATxmega64/128B3	
		Rev. A	Rev. C
Device	2.2.1. Power-Down Consumption	X	-
	2.2.2. Device Revision Number is Unchanged Between Rev. B and Rev. C	-	X
ADC	2.3.1. ADC Conversion Error when x0.5 Gain is used	X	-
AWeX	2.4.1. AWeX Fault Protection Restore is Not Done Correctly in Pattern Generation Mode	-	X
USART	2.5.1. Disabling of USART Transmitter Does Not Automatically Set the TxD Pin to Input	X	-

Note: The following silicon revisions were never released to production:

- Rev. B

2. Silicon Errata Issues

2.1 Errata Details

- Erratum is not applicable.

X Erratum is applicable.

2.2 Device

2.2.1 Power-Down Consumption

After reset, extra power consumption is drawn when the system enters power-down or when ADC is disabled.

Workaround

Set ADC to a configuration different from the Differential Mode.

Affected Silicon Revisions

ATxmega128/64B3	
Rev. A	**Rev. C**
X	-

2.2.2 Device Revision Number is Unchanged Between Rev. B and Rev. C

Device revision number is unchanged between Rev. B and Rev. C.

Workaround

There is no workaround.

Affected Silicon Revisions

ATxmega128/64B3	
Rev. A	**Rev. C**
-	X

2.3 ADC - Analog to Digital Converter

2.3.1 ADC Conversion Error when x0.5 Gain is used

When setting the gain to x0.5, the conversion result is similar to the gain setting x1.

Workaround

There is no workaround.

Affected Silicon Revisions

ATxmega128/64B3	
Rev. A	Rev. C
X	-

2.4 AWeX - Advanced Waveform eXtension

2.4.1 AWeX Fault Protection Restore is Not Done Correctly in Pattern Generation Mode

When a fault is detected, the OUTOVEN register is cleared, and when the fault condition is cleared, OUTOVEN is restored according to the corresponding enabled DTI channels. For Common Waveform Channel Mode (CWCM), as the OUTOVEN is correct after restoring from fault, this has no effect. For Pattern Generation Mode (PGM), OUTOVEN should instead have been restored according to the DTLSBUF register.

Workaround

For CWCM, no workaround is required.

For PGM in Latched Mode, disable the DTI channels before returning from the fault condition. Then, set the correct OUTOVEN value and enable the DTI channels before the direction (DIR) register is written to enable the correct outputs again.

Affected Silicon Revisions

ATxmega128/64B3	
Rev. A	Rev. C
-	X

2.5 USART - Universal Synchronous/Asynchronous Receiver/Transmitter

2.5.1 Disabling of USART Transmitter Does Not Automatically Set the TxD Pin to Input

If the USART transmitter is idle with no frames to transmit, setting TXEN to zero will not automatically set the TxD pin direction to input.

Workaround

The TxD pin direction can be set to input using the Port DIR register. Be advised that setting the Port DIR register to input will be immediate. Ongoing transmissions will be truncated.

Affected Silicon Revisions

ATxmega128/64B3	
Rev. A	Rev. C
X	-

3. Data Sheet Clarifications

Note the following typographic corrections and clarifications for the latest version of the device data sheet (https://ww1.microchip.com/downloads/en/DeviceDoc/Atmel-8074-8-and-16-bit-AVR-Microcontroller-XMEGA-B-ATxmega64B3-ATxmega128B3_Datasheet.pdf).

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

3.1 Errata Section in Data Sheet is no Longer Valid

A clarification for the Errata section in the device data sheet has been made.

The errata content has been moved to a separate document, *ATxmega128/64B3* (this document).

See the *Silicon Errata Issues* section of this document for the latest errata.

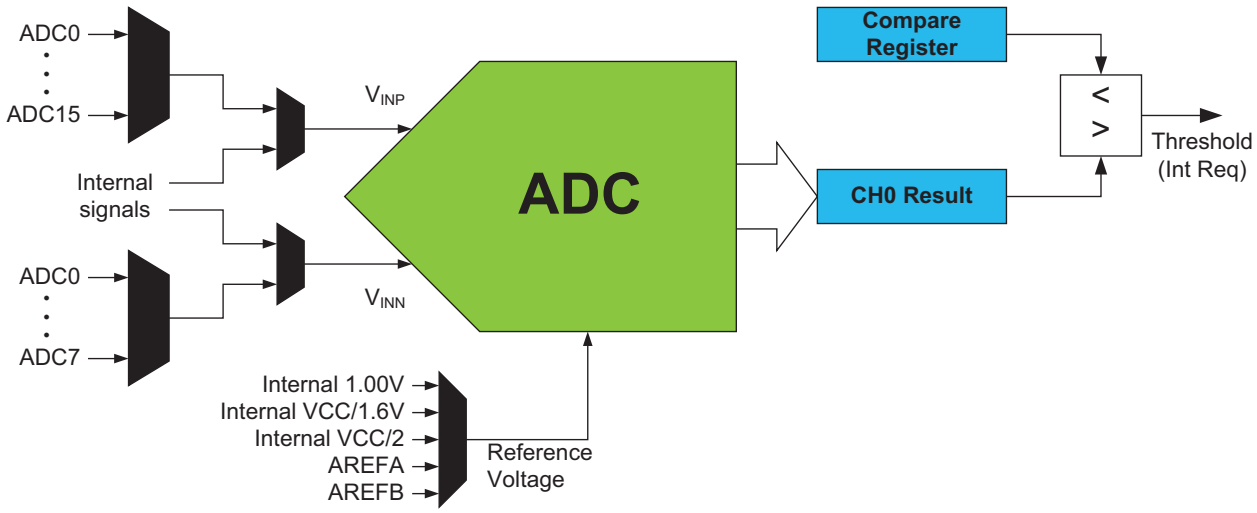
3.2 ADC – 12-bit Analog to Digital Converter

3.2.1 Overview

The ADC converts analog signals to digital values. The ADC has a 12-bit resolution and can convert up to 300 thousand samples per second (ksps). The input selection is flexible, and both single-ended and differential measurements can be done. An optional gain stage is available to increase the dynamic range for differential measurements.

The ADC can provide both signed and unsigned results. The ADC measurements can be started either by application software or an incoming event from another peripheral in the device. The ADC measurements can be started with predictable timing and without software intervention. When conversions are done, it is possible to use DMA to move ADC results directly to memory or peripherals. Both internal and external reference voltages can be used. An integrated temperature sensor is available for use with the ADC. The ADC can also measure the $AV_{CC}/10$ output and the band gap voltage. The ADC has a Compare function for accurate monitoring of user-defined thresholds with minimum software intervention required.

Figure 3-1. ADC Overview



The ADC may be configured for an 8- or 12-bit result. The minimum conversion time (propagation delay) reduces from 3.35 µs for a 12-bit result to 2.3µs for an 8-bit.

ADC conversion results are left or right adjusted with optional '1' or '0' padding, which eases calculation when the result is presented as a signed integer (signed 16-bit number).

PORTB has one ADC. Notation of this peripheral is ADCB.

Note: After the ADC is enabled, the first sample may deviate from the expected result. It is recommended to discard the first sample or accumulate several samples.

4. Document Revision History

Note: The document revision is independent of the silicon revision.

4.1 Revision History

Doc. Rev.	Date	Comments
A	03/2022	Initial release of this document. • Content moved from the data sheet and restructured to the new document template • Added data sheet clarification section 3.2. ADC – 12-bit Analog to Digital Converter and added a note in 3.2.1. Overview

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