



Product Change Notification / SYST-17ZAXF644

Date:

22-Sep-2020

Product Category:

8-bit Microcontrollers

PCN Type:

Document Change

Notification Subject:

ERRATA - ATmega48A/PA/88A/PA/168A/PA/328/P Silicon Errata and Data Sheet Clarification

Affected CPNs:

[SYST-17ZAXF644_Affected_CPN_09222020.pdf](#)

[SYST-17ZAXF644_Affected_CPN_09222020.csv](#)

Notification Text:

SYST-17ZAXF644

Microchip has released a new Product Documents for the ATmega48A/PA/88A/PA/168A/PA/328/P Silicon Errata and Data Sheet Clarification of devices. If you are using one of these devices please read the document located at

[ATmega48A/PA/88A/PA/168A/PA/328/P 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) Updated the die revision list to reflect die revisions in production

Impacts to Data Sheet: None

Reason for Change: To Improve Productivity

Change Implementation Status: Complete

Date Document Changes Effective: 22 Sep 2020

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:

[ATmega48A/PA/88A/PA/168A/PA/328/P Silicon Errata and Data Sheet Clarification](#)

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Affected Catalog Part Numbers (CPN)

ATMEGA168A-AU
ATMEGA168A-AUR
ATMEGA168A-MMH
ATMEGA168A-MMHR
ATMEGA168A-MU
ATMEGA168A-MUR
ATMEGA168A-PU
ATMEGA168PA-15AZ
ATMEGA168PA-15AZT
ATMEGA168PA-15AZTV02
ATMEGA168PA-15MZ
ATMEGA168PA-15MZV01
ATMEGA168PA-15MZV03
ATMEGA168PA-15MZV04
ATMEGA168PA-AN
ATMEGA168PA-ANR
ATMEGA168PA-AU
ATMEGA168PA-AUR
ATMEGA168PA-MMH
ATMEGA168PA-MMHR
ATMEGA168PA-MN
ATMEGA168PA-MNR
ATMEGA168PA-MU
ATMEGA168PA-MUA2
ATMEGA168PA-MUR
ATMEGA168PA-MURA2
ATMEGA168PA-PN
ATMEGA168PA-PU
ATMEGA328-AU
ATMEGA328-AUR
ATMEGA328-MMH
ATMEGA328-MMHR
ATMEGA328-MU
ATMEGA328-MUR
ATMEGA328-PU
ATMEGA328P-15AZ
ATMEGA328P-15MZ
ATMEGA328P-AN
ATMEGA328P-ANR
ATMEGA328P-AU
ATMEGA328P-AUR
ATMEGA328P-AURA0
ATMEGA328P-MMH
ATMEGA328P-MMHR
ATMEGA328P-MN
ATMEGA328P-MNR

ATMEGA328P-MU
ATMEGA328P-MUR
ATMEGA328P-PN
ATMEGA328P-PU
ATMEGA48A-AU
ATMEGA48A-AUR
ATMEGA48A-MMH
ATMEGA48A-MMHR
ATMEGA48A-MU
ATMEGA48A-MUR
ATMEGA48A-PU
ATMEGA48PA-15AZ
ATMEGA48PA-15MZ
ATMEGA48PA-15MZV01
ATMEGA48PA-AN
ATMEGA48PA-ANR
ATMEGA48PA-AU
ATMEGA48PA-AUA8
ATMEGA48PA-AUR
ATMEGA48PA-AURA9
ATMEGA48PA-AURB0
ATMEGA48PA-MMH
ATMEGA48PA-MMHR
ATMEGA48PA-MMHRA1
ATMEGA48PA-MMN
ATMEGA48PA-MMNR
ATMEGA48PA-MN
ATMEGA48PA-MNR
ATMEGA48PA-MU
ATMEGA48PA-MUR
ATMEGA48PA-PN
ATMEGA48PA-PU
ATMEGA88A-AU
ATMEGA88A-AUR
ATMEGA88A-MMH
ATMEGA88A-MMHR
ATMEGA88A-MU
ATMEGA88A-MUR
ATMEGA88A-PU
ATMEGA88PA-15AZ
ATMEGA88PA-15AZT
ATMEGA88PA-15AZV01
ATMEGA88PA-15AZV02
ATMEGA88PA-15MZ
ATMEGA88PA-15MZV03
ATMEGA88PA-15MZV04
ATMEGA88PA-15MZV05
ATMEGA88PA-15MZV06
ATMEGA88PA-AN

ATMEGA88PA-ANR
ATMEGA88PA-AU
ATMEGA88PA-AUA5
ATMEGA88PA-AUA6
ATMEGA88PA-AUR
ATMEGA88PA-AURA3
ATMEGA88PA-MMH
ATMEGA88PA-MMHR
ATMEGA88PA-MMN
ATMEGA88PA-MMNR
ATMEGA88PA-MMUR
ATMEGA88PA-MN
ATMEGA88PA-MNR
ATMEGA88PA-MU
ATMEGA88PA-MUR
ATMEGA88PA-MURA06
ATMEGA88PA-MURA6
ATMEGA88PA-PN
ATMEGA88PA-PU



ATmega48A/PA/88A/PA/ 168A/PA/328/P

ATmega48A/PA/88A/PA/168A/PA/328/P Silicon Errata and Data Sheet Clarification

Introduction

The ATmega48A/PA/88A/PA/168A/PA/328/P devices you have received conform functionally to the current device data sheet (www.microchip.com/DS40002061), except for the anomalies described in this document. The erratas described in this document will likely be addressed in future revisions of the ATmega48A/PA/88A/PA/168A/PA/328/P devices.

Note:

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

Table of Contents

Introduction.....	1
1. Silicon Issue Summary.....	3
2. Silicon Errata Issues.....	4
2.1. Errata Details.....	4
2.2. System Clock and Clock Options.....	4
2.3. TWI - Two-Wire Interface	4
2.4. AC - Analog Comparator.....	5
3. Data Sheet Clarifications.....	6
3.1. None.....	6
4. Document Revision History.....	7
4.1. Revision History.....	7
The Microchip Website.....	8
Product Change Notification Service.....	8
Customer Support.....	8
Microchip Devices Code Protection Feature.....	8
Legal Notice.....	9
Trademarks.....	9
Quality Management System.....	10
Worldwide Sales and Service.....	11

1. Silicon Issue Summary

Legend

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

Peripheral	Short Description	Valid for Silicon Revision								
		ATmega48A/PA		ATmega88A/PA		ATmega168A/PA		ATmega328/P		
		Rev. D (1)	Rev. E	Rev. F (1)	Rev. G	Rev. E (1)	Rev. L	Rev. A	Rev. B	Rev. D
System Clock and Clock Options	2.2.1 Unstable 32 kHz Oscillator	-	-	-	-	-	-	X	X	-
TWI	2.3.1 TWI Data Setup Time Can Be Too Short	X	X	X	X	X	X	-	-	X
Analog Comparator	2.4.1 Analog MUX Can Be Turned Off When Setting the ACME Bit	X	X	X	X	X	X	X	X	X

Note:

1. This revision is the initial release of the silicon.

The following silicon revisions were never released to production:

- ATmega48A/PA
 - Rev. A-C
- ATmega88A/PA
 - Rev. A-E
- ATmega168A/PA
 - Rev. A-D
 - Rev. F-K
- ATmega328/P
 - Rev. C

2. Silicon Errata Issues

2.1 Errata Details

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

2.2 System Clock and Clock Options

2.2.1 Unstable 32 kHz Oscillator

The 32 kHz oscillator does not work as a system clock and if it used as an asynchronous timer, it is inaccurate.

Work around

None.

Affected Silicon Revisions

ATmega48A/PA		
Rev. D	Rev. E	
-	-	

ATmega88A/PA	
Rev. F	Rev. G
-	-

ATmega168A/PA	
Rev. E	Rev. L
-	-

ATmega328/P		
Rev. A	Rev. B	Rev. D
X	X	-

2.3 TWI - Two-Wire Interface

2.3.1 TWI Data Setup Time Can Be Too Short

When running the device as a TWI slave with a system clock above 2 MHz, the data setup time for the first bit after ACK may, in some cases, be too short. This may cause a false start or stop condition on the TWI line.

Work around

Insert a delay between setting TWDR and TWCR.

Affected Silicon Revisions

ATmega48A/PA		
Rev. D		Rev. E
X		X

ATmega88A/PA	
Rev. F	Rev. G
X	X

ATmega168A/PA	
Rev. E	Rev. L
X	X

ATmega328/P		
Rev. A	Rev. B	Rev. D
-	-	X

2.4 AC - Analog Comparator

2.4.1 Analog MUX Can Be Turned Off When Setting the ACME Bit

If the ACME (Analog Comparator Multiplexer Enabled) bit in ADCSRB is set while MUX3 in ADMUX is '1' (ADMUX[3:0]=1xxx), all MUXs are turned off until the ACME bit is cleared.

Work around

Clear the MUX3 bit before setting the ACME bit.

Affected Silicon Revisions

ATmega48A/PA		
Rev. D		Rev. E
X		X

ATmega88A/PA	
Rev. F	Rev. G
X	X

ATmega168A/PA	
Rev. E	Rev. L
X	X

ATmega328/P		
Rev. A	Rev. B	Rev. D
X	X	X

3. Data Sheet Clarifications

The following typographic corrections and clarifications are to be noted for the latest version of the device data sheet (www.microchip.com/DS40002061).

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

3.1 None

There are no known data sheet clarifications as of this publication date.

4. Document Revision History

Note: The data sheet clarification document revision is independent of the die revision and the device variant (last letter of the ordering number).

4.1 Revision History

Doc Rev.	Date	Comments
A	09/2020	Initial release of this document. <ul style="list-style-type: none">• Content moved from the data sheet and restructured to the new document template• Updated the die revision list to reflect die revisions in production

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