



## Product Change Notification / SYST-17ZAXF644

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### 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

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

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### Introduction

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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](http://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.

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### 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	<a href="#">2.2.1 Unstable 32 kHz Oscillator</a>	-	-	-	-	-	-	X	X	-
TWI	<a href="#">2.3.1 TWI Data Setup Time Can Be Too Short</a>	X	X	X	X	X	X	-	-	X
Analog Comparator	<a href="#">2.4.1 Analog MUX Can Be Turned Off When Setting the ACME Bit</a>	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](http://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"><li>• Content moved from the data sheet and restructured to the new document template</li><li>• Updated the die revision list to reflect die revisions in production</li></ul>

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