

### Product Change Notification / SYST-23MVTN435

### Date:

24-Mar-2022

### **Product Category:**

8-bit Microcontrollers

### **PCN Type:**

**Document Change** 

### **Notification Subject:**

ERRATA - ATmega48P/PV/88P/PV/168P/PV Silicon Errata and Data Sheet Clarifications Revision

### **Affected CPNs:**

SYST-23MVTN435\_Affected\_CPN\_03242022.pdf SYST-23MVTN435\_Affected\_CPN\_03242022.csv

### Notification Text:

SYST-23MVTN435

Microchip has released a new Product Documents for the ATmega48P/PV/88P/PV/168P/PV Silicon Errata and Data Sheet Clarifications of devices. If you are using one of these devices please read the document located at ATmega48P/PV/88P/PV/168P/PV Silicon Errata and Data Sheet Clarifications.

#### Notification Status: Final

Description of Change: Initial document release.

- Content moved from the data sheet and restructured to the new document template
- Updated the silicon revision list to reflect silicon revisions in production
- Data sheet clarification added:
  - 3.1. Errata Section in Data Sheet is no Longer Valid
  - 3.2. Ordering Information
  - 3.3. Package Information

Impacts to Data Sheet: None

Reason for Change: To Improve Productivity

Change Implementation Status: Complete

Date Document Changes Effective: 24 March 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:

ATmega48P/PV/88P/PV/168P/PV Silicon Errata and Data Sheet Clarifications

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ATMEGA168P-20PU ATMEGA168PV-10PU ATMEGA168PV-10MU ATMEGA168P-20MU ATMEGA168P-20AU ATMEGA168PV-10AU ATMEGA168P-20MO ATMEGA168P-20AN ATMEGA168PV-10AN ATMEGA168P-20MQR ATMEGA168P-20ANR ATMEGA168PV-10MUR ATMEGA168PV-10MUR455 ATMEGA168P-20MUR ATMEGA168P-20AUR ATMEGA168PV-10AUR ATMEGA88P-20PU ATMEGA88PV-10PU ATMEGA88P-20MU ATMEGA88PV-10MU ATMEGA88P-20AU ATMEGA88PV-10AU ATMEGA88P-20MUR ATMEGA88PV-10MUR ATMEGA88PV-10AUR ATMEGA88P-20AUR ATMEGA48P-20PU ATMEGA48PV-10PU ATMEGA48PV-10PUA2 ATMEGA48P-20MMU ATMEGA48PV-10MMU ATMEGA48PV-10MU ATMEGA48P-20MU ATMEGA48PV-10AU ATMEGA48P-20AU ATMEGA48P-20MMUR ATMEGA48PV-10MMUR ATMEGA48P-20MUR ATMEGA48PV-10MUR ATMEGA48PV-10AUR ATMEGA48P-20AUR



# ATmega48P/PV/88P/PV/ 168P/PV

# Silicon Errata and Data Sheet Clarifications

### Introduction

The ATmega48P/PV/88P/PV/168P/PV devices you have received conform functionally to the current device data sheet (www.microchip.com/DS40002065), except for the anomalies described in this document. The errata described in this document will likely be addressed in future revisions of the ATmega48P/PV/88P/PV/168P/PV 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.

		Valid for Silicon Revision						
Peripheral	Short Description	ATmega48P/PV		ATmega88P/PV		ATmega168P/PV		
		Rev. B( <u>1)</u>	Rev. C	Rev. A	Rev. B	Rev. C	Rev. A	Rev. B
Device	No known errata							

#### Note:

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

### 2. Silicon Errata Issues

#### 2.1 None

There are no known errata as of this publication date.

### 3. Data Sheet Clarifications

Note the following typographic corrections and clarifications for the latest version of the device data sheet (www.microchip.com/DS40002065).

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, *ATmega48P/PV/88P/PV/168P/PVSilicon Errata* and Data Sheet Clarification (this document).

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

#### 3.2 Ordering Information

A clarification has been made to tables titled 'Package Type' for all devices documented in the data sheet:

• A note to the 32M1-A row was added informing that the package type can be delivered in two different styles

Package Type				
32A	32-lead, (1.0 mm) Plastic Thin Quad Flat Package (TQFP)			
28M1	28-pad, 4 x 4 x 1.0 body, Lead Pitch 0.45 mm Very Thin Plastic Quad Flat No-Lead (VQFN)			
32M1-A <sup>(1)</sup>	32-pad, 5 x 5 x 1.0 body, Lead Pitch 0.50 mm Thin Plastic Quad Flat No-Lead (VQFN)			
28P3	28-lead, 0.300" Wide, Skinny Plastic Dual Inline Package (SPDIP)			

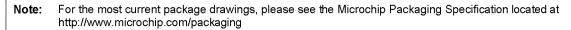
1. This package type can be delivered with two different styles with reference numbers 'C04-21400' (punched) and 'C04-21395' (sawn), as shown in section 3.2.1 - 32M1-A. For PCB layouts, it is recommended to consider both *recommended land patterns*.

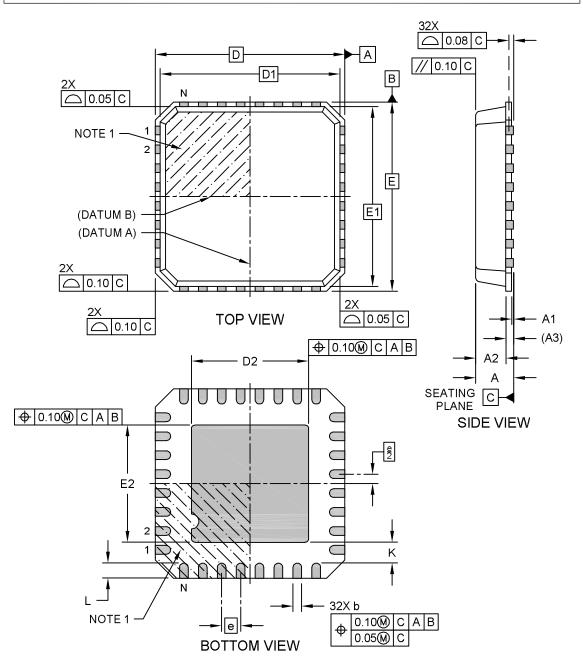
#### 3.3 Package Information

A clarification about the other package style available for package type 32M1-A has been added to the 32M1-A section.

#### 3.3.1 32M1-A

#### 32-Lead Thin Plastic Quad Flat, No Lead Package (S4B) - 5x5 mm Body [VQFN] Punch Singulated; 3.10x3.10 mm Exposed Pad

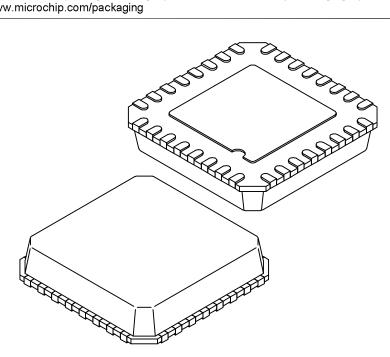




Microchip Technology Drawing C04-21400 Rev B Sheet 1 of 2

#### 32-Lead Thin Plastic Quad Flat, No Lead Package (S4B) - 5x5 mm Body [VQFN] Punch Singulated; 3.10x3.10 mm Exposed Pad

**Note:** For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	N	IILLIMETER	S	
Dimensior	n Limits	MIN	NOM	MAX	
Number of Terminals	Ν	32			
Pitch	е	0.50 BSC			
Overall Height	Α	0.80	0.85	1.00	
Standoff	A1	0.00	0.02	0.05	
Mold Cap Thickness	A2	-	0.65	0.70	
Terminal Thickness	A3	0.20 REF			
Overall Length	D	5.00 BSC			
Mold Cap Length D1 4.75 BSC					
Exposed Pad Length	D2	2.95	3.10	3.25	
Overall Width	E	5.00 BSC			
Mold Cap Width	E1	4.75 BSC			
Exposed Pad Width	E2	2.95	3.10	3.25	
Terminal Width	b	0.18	0.23	0.30	
Terminal Length	L	0.30	0.40	0.50	
Terminal-to-Exposed-Pad	K	0.20	-	-	

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.

2. Package is punch singulated

3. Dimensioning and tolerancing per ASME Y14.5M

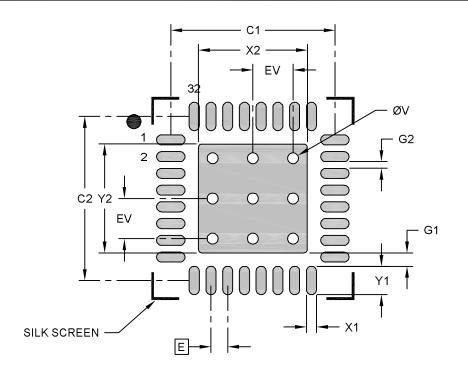
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-21400 Rev B Sheet 2 of 2

#### 32-Lead Thin Plastic Quad Flat, No Lead Package (S4B) - 5x5 mm Body [VQFN] Punch Singulated; 3.10x3.10 mm Exposed Pad

**Note:** For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



#### RECOMMENDED LAND PATTERN

	MILLIMETERS			
Dimension	Dimension Limits		NOM	MAX
Contact Pitch	Е	0.50 BSC		
Optional Center Pad Width	X2			3.25
Optional Center Pad Length	Y2			3.25
Contact Pad Spacing	C1		4.90	
Contact Pad Spacing	C2		4.90	
Contact Pad Width (X32)	X1			0.30
Contact Pad Length (X32)	Y1			0.85
Contact Pad to Center Pad (X32)	G1	0.40		
Contact Pad to Contact Pad (X28)	G2	0.20		
Thermal Via Diameter	V		0.33	
Thermal Via Pitch EV			1.20	

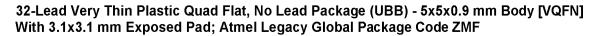
Notes:

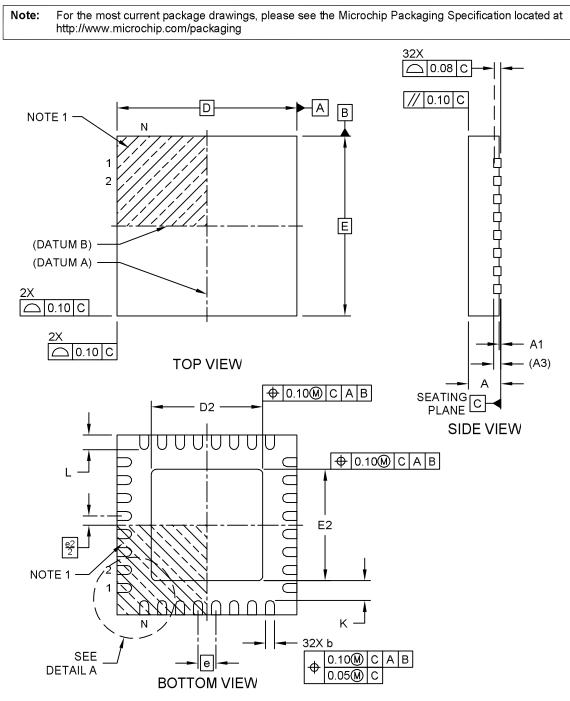
1. Dimensioning and tolerancing per ASME Y14.5M

BSC: Basic Dimension. Theoretically exact value shown without tolerances.

2. For best soldering results, thermal vias, if used, should be filled or tented to avoid solder loss during reflow process

Microchip Technology Drawing C04-23400 Rev B

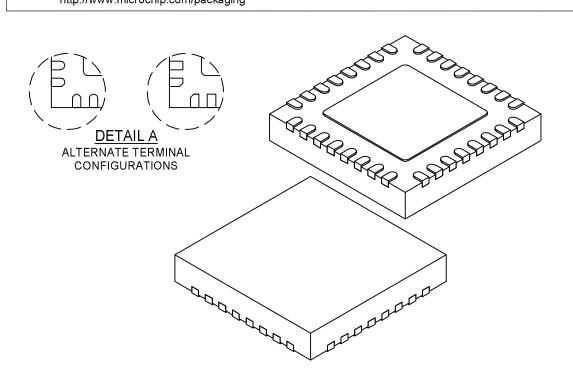




Microchip Technology Drawing C04-21395-UBB Rev C Sheet 1 of 2

# 32-Lead Very Thin Plastic Quad Flat, No Lead Package (UBB) - 5x5x0.9 mm Body [VQFN] With 3.1x3.1 mm Exposed Pad; Atmel Legacy Global Package Code ZMF

**Note:** For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units		MILLIMETERS		
Dimension	Limits	MIN	NOM	MAX	
Number of Terminals	N	32			
Pitch	е		0.50 BSC		
Overall Height	Α	0.80	0.85	0.90	
Standoff	A1	0.00	0.02	0.05	
Terminal Thickness	A3	0.203 REF			
Overall Length	D 5.00 BSC				
Exposed Pad Length D2 3.00 3.10		3.10	3.20		
Overall Width		5.00 BSC			
Exposed Pad Width	E2	3.00	3.10	3.20	
Terminal Width	b	0.18	0.25	0.30	
Terminal Length	L	0.30	0.40	0.50	
Terminal-to-Exposed-Pad	K	0.20	-	-	

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.

2. Package is saw singulated

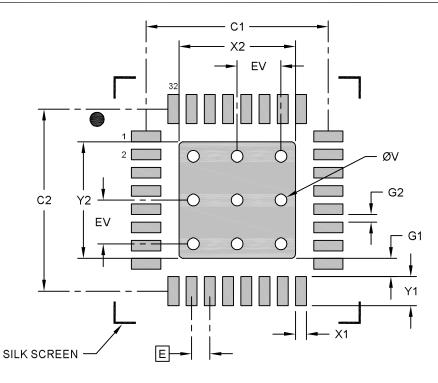
3. Dimensioning and tolerancing per ASME Y14.5M

BSC: Basic Dimension. Theoretically exact value shown without tolerances. REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-21395-UBB Rev C Sheet 2 of 2

#### 32-Lead Very Thin Plastic Quad Flat, No Lead Package (UBB) - 5x5x0.9 mm Body [VQFN] With 3.1x3.1 mm Exposed Pad; Atmel Legacy Global Package Code ZMF

**Note:** For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



#### **RECOMMENDED LAND PATTERN**

	Units		MILLIMETERS		
Dimension	Limits	MIN	NOM	MAX	
Contact Pitch	E	0.50 BSC			
Center Pad Width	X2			3.20	
Center Pad Length	Y2			3.20	
Contact Pad Spacing	C1		5.00		
Contact Pad Spacing	C2		5.00		
Contact Pad Width (X32)	X1			0.30	
Contact Pad Length (X32)	Y1			0.80	
Contact Pad to Center Pad (X32)	G1	0.20			
Contact Pad to Contact Pad (X28)	G2	0.20			
Thermal Via Diameter	V		0.33		
Thermal Via Pitch	EV		1.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

BSC: Basic Dimension. Theoretically exact value shown without tolerances.

2. For best soldering results, thermal vias, if used, should be filled or tented to avoid solder loss during reflow process

Microchip Technology Drawing C04-23395-UBB Rev C

### **Document Revision History**

### 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	<ul> <li>Initial document release.</li> <li>Content moved from the data sheet and restructured to the new document template</li> <li>Updated the silicon revision list to reflect silicon revisions in production</li> <li>Data sheet clarification added: <ul> <li>3.1. Errata Section in Data Sheet is no Longer Valid</li> <li>3.2. Ordering Information</li> <li>3.3. Package Information</li> </ul> </li> </ul>

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