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 Errata Section in Data Sheet is no Longer Valid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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Affected Catalog Part Numbers (CPN)

ATMEGA168P-20PU
ATMEGA168PV-10PU
ATMEGA168PV-10MU
ATMEGA168P-20MU
ATMEGA168P-20AU
ATMEGA168PV-10AU
ATMEGA168P-20MQ
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.

Peripheral	Short Description	Valid for Silicon Revision						
		ATmega48P/PV		ATmega88P/PV			ATmega168P/PV	
		Rev. B[1]	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(1)	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*.**

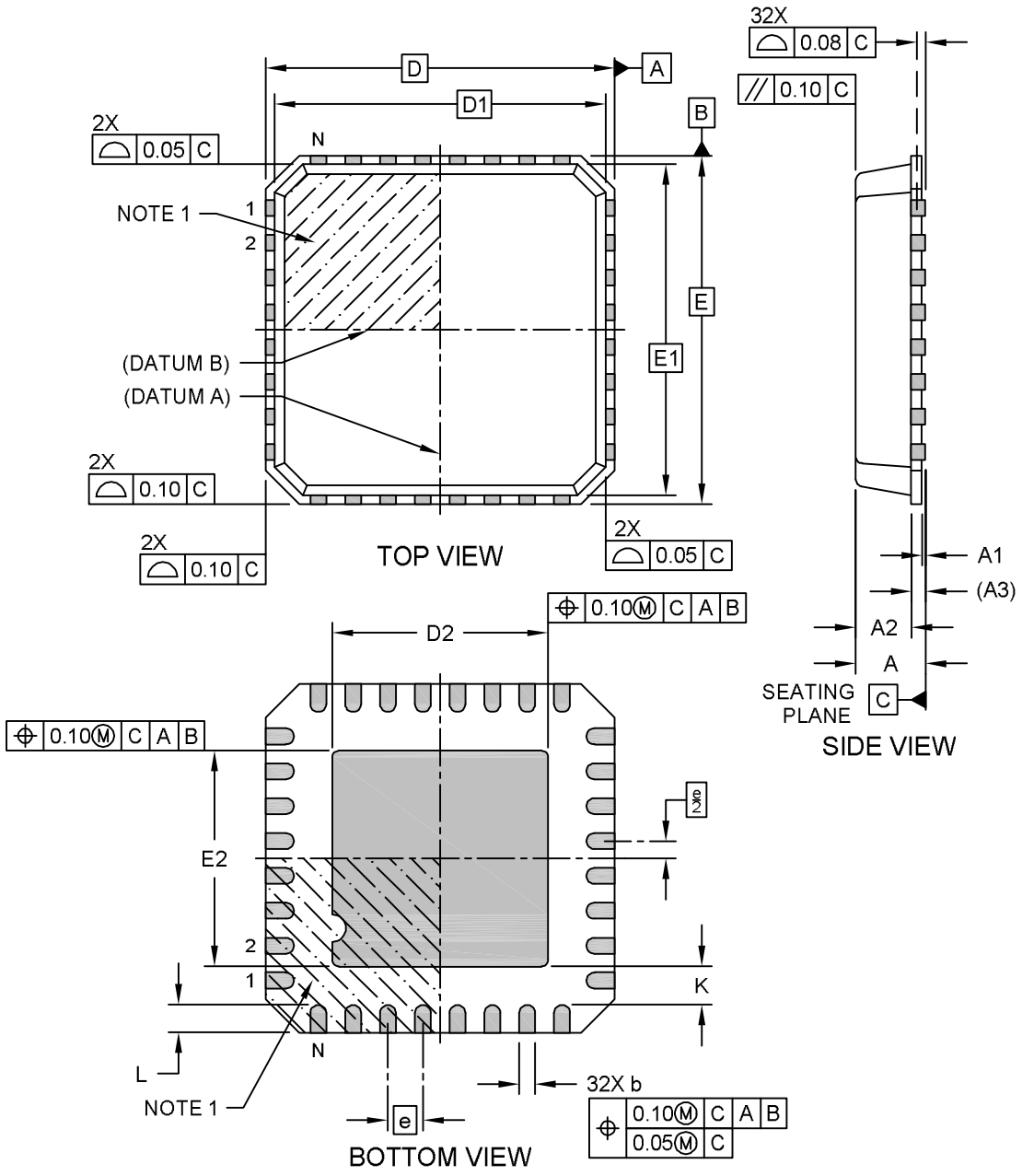
3.3 Package Information

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

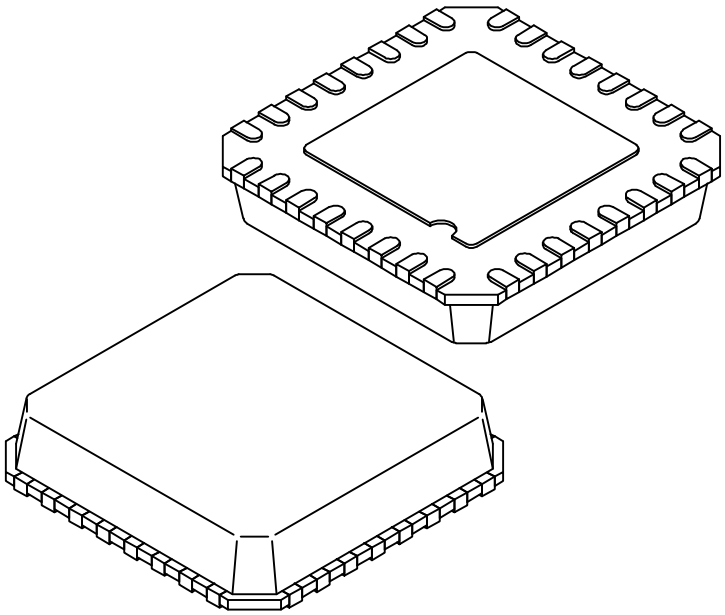
Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



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		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Terminals	N		32	
Pitch	e		0.50 BSC	
Overall Height	A	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	-	-

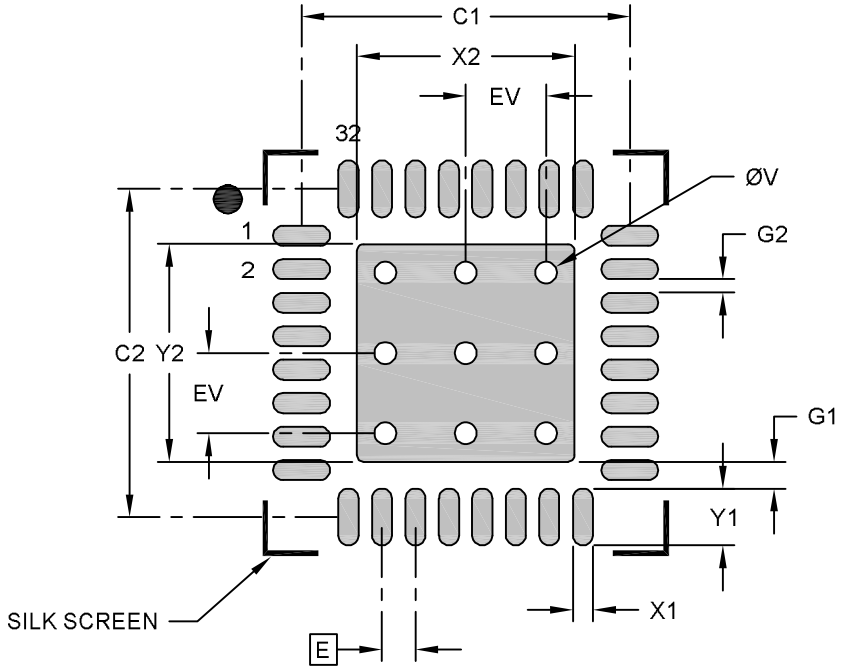
Notes:

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

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E		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	

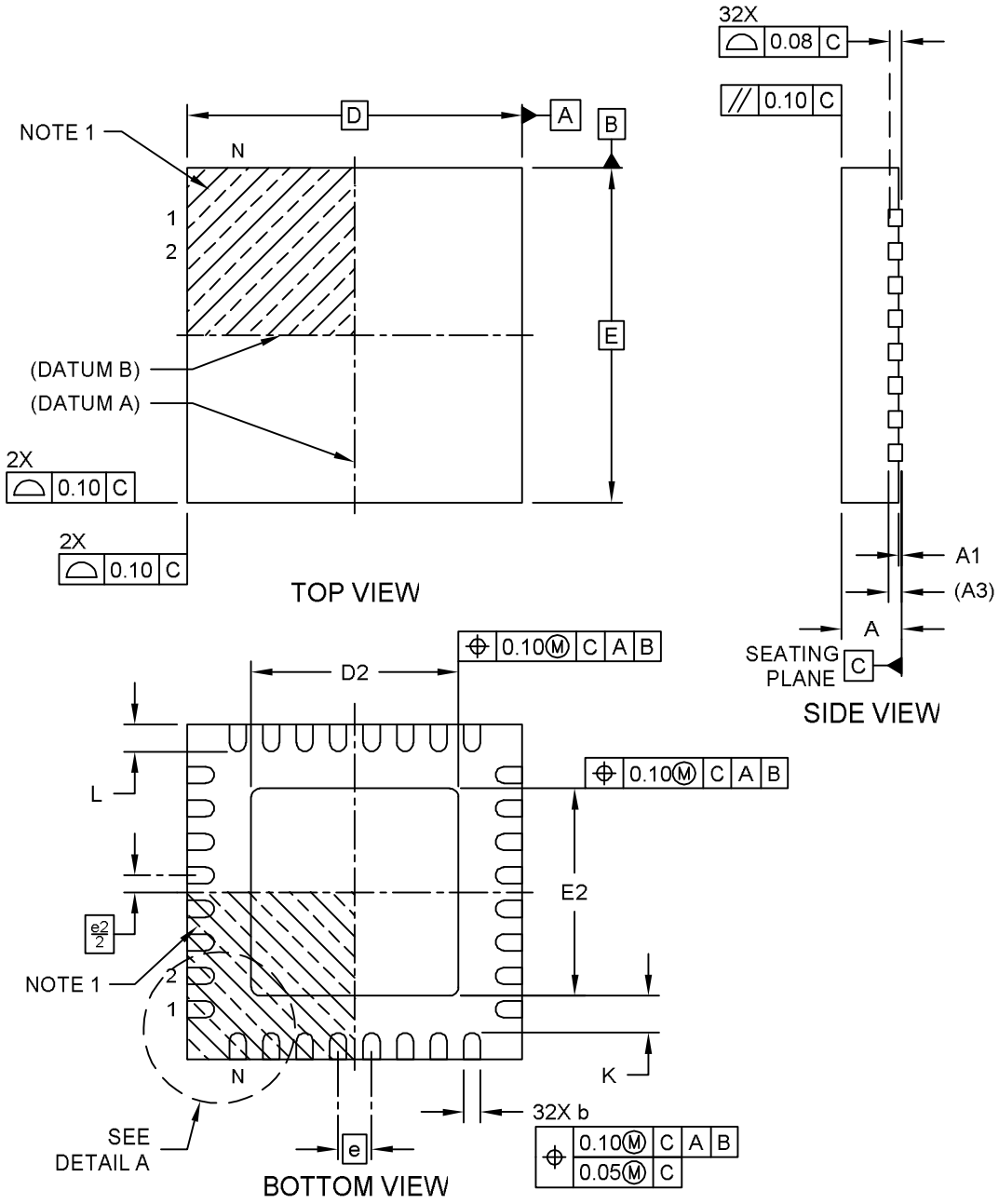
Notes:

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

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

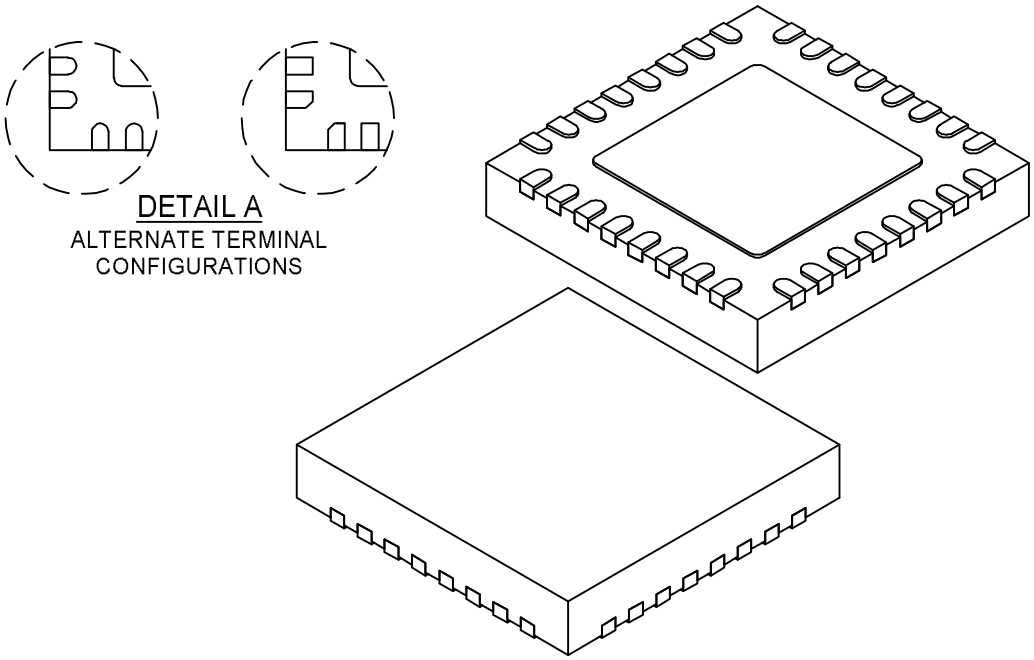
Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



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	e		0.50 BSC	
Overall Height	A	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	3.20
Overall Width	E		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	-	-

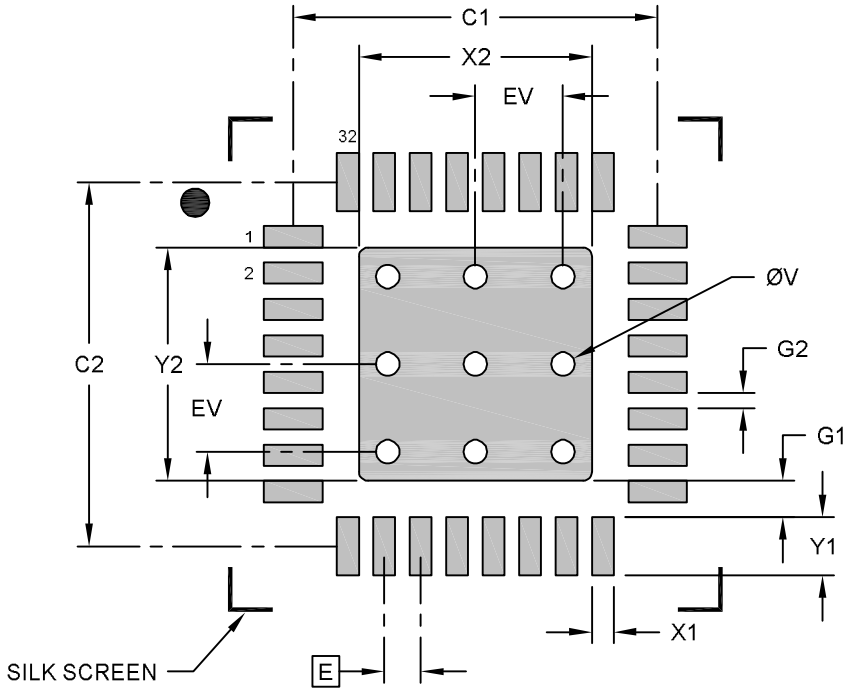
Notes:

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

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 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

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