



Product Change Notification / SYST-07SUZX681

Date:

08-Feb-2023

Product Category:

8-bit Microcontrollers

PCN Type:

Document Change

Notification Subject:

ERRATA - AVR64EA28/32/48 Silicon Errata and Data Sheet Clarifications

Affected CPNs:

[SYST-07SUZX681_Affected_CPN_02082023.pdf](#)

[SYST-07SUZX681_Affected_CPN_02082023.csv](#)

Notification Text:

SYST-07SUZX681

Microchip has released a new Errata for the AVR64EA28/32/48 Silicon Errata and Data Sheet Clarifications of devices. If you are using one of these devices please read the document located at [AVR64EA28/32/48 Silicon Errata and Data Sheet Clarifications](#).

Notification Status: Final

Description of Change: Initial document release

Impacts to Data Sheet: None

Change Implementation Status: Complete

Date Document Changes Effective: 08 Feb 2023

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:

[AVR64EA28/32/48 Silicon Errata and Data Sheet Clarifications](#)

Please contact your local [Microchip sales office](#) with questions or concerns regarding this notification.

Terms and Conditions:

If you wish to receive Microchip PCNs via email please register for our PCN email service at our [PCN home page](#) select register then fill in the required fields. You will find instructions about registering for Microchips PCN email service in the [PCN FAQ](#) section.

If you wish to change your PCN profile, including opt out, please go to the [PCN home page](#) select login and sign into your myMicrochip account. Select a profile option from the left navigation bar and make the applicable selections.

Affected Catalog Part Numbers (CPN)

AVR64EA48-I/6LX

AVR64EA28-I/SP

AVR64EA28-I/SS

AVR64EA32-I/RXB

AVR64EA28-I/STX

AVR64EA32-I/PT

AVR64EA48-I/PT

AVR64EA48T-I/6LXC01



AVR64EA28/32/48

Silicon Errata and Data Sheet Clarifications

The AVR64EA28/32/48 devices you have received conform functionally to the current device data sheet (www.microchip.com/DS40002443), except for the anomalies described in this document. The errata described in this document will likely be addressed in future revisions of the AVR64EA28/32/48 devices.

Notes:

- This document summarizes all the silicon errata issues from all the silicon revisions, previous and current
- Refer to the Device/Revision ID section in the current device data sheet (www.microchip.com/DS40002443) for more detailed information on Device Identification and Revision IDs for your specific device, or contact your local Microchip sales office for assistance

1. Silicon Issue Summary

Legend

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

Peripheral	Short Description	Valid for Silicon Revision
		Rev. B1 ⁽¹⁾
Device	2.2.1. NVM Programming Does Not Work Below 2.7V	X
	2.2.2. Reduced Flash Endurance for VDD Below BODLEVEL3	X
CRCSCAN	2.3.1. Running CRC Scan on Part of The Flash is Non-Functional	X
NVMCTRL	2.4.1. Flash Multi Page Erase Non-Functional from UPDI	X
	2.4.2. Flash Page Erase/Write Operation Non-Functional	X
USART	2.5.1. Receiver Non-Functional after Detection of Inconsistent Synchronization Field	X

Note:

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

2. Silicon Errata Issues

2.1 Errata Details

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

2.2 Device

2.2.1 NVM Programming Does Not Work Below 2.7V

Performing an erase or write operation when V_{DD} is below 2.7V may fail. It is recommended to ensure that V_{DD} is above 2.7V before starting an erase or write operation. Alternatively BOD can be enabled with level set to BODLEVEL2, or higher.

Work Around

None.

Affected Silicon Revisions

Rev. B1
X

2.2.2 Reduced Flash Endurance for V_{DD} Below BODLEVEL3

If operating at V_{DD} below BODLEVEL3, Flash endurance is reduced to 1k erase/write cycles. The reduction is independent of the V_{DD} level during erase/write.

Work Around

None

Affected Silicon Revisions

Rev. B1
X

2.3 CRCSCAN - Cyclic Redundancy Check Memory Scan

2.3.1 Running CRC Scan on Part of The Flash is Non-Functional

- Running CRC scan on the boot section does not work if FUSE.BOOTSIZE is different from 0x00
- Running CRC scan on the boot and application section does not work if FUSE.CODESIZE is different from 0x00
- Running CRC scan on the entire Flash works

Work Around

None

Affected Silicon Revisions

Rev. B1
X

2.4 NVMCTRL - Nonvolatile Memory Controller**2.4.1 Flash Multi Page Erase Non-Functional from UPDI**

Performing a Flash multi-page erase (writing the CMD bitfield in NVMCTRL.CTRLA to FLMPERn) from UPDI does not work on the boot section. It is not recommended to use multi-page erase on any Flash section.

Work Around

Use Flash page erase (writing the CMD bitfield in NVMCTRL.CTRLA to 0x08).

Affected Silicon Revisions

Rev. B1
X

2.4.2 Flash Page Erase/Write Operation Non-Functional

If the Flash NRWW section is read during a Flash page erase/write operation (the CMD bitfield in NVMCTRL.CTRLA is 0x05), the page write will be ignored.

Work Around

Perform Flash page erase (writing the CMD bitfield in NVMCTRL.CTRLA to 0x08) and write (writing the CMD bitfield in NVMCTRL.CTRLA to 0x04) as two separate operations. Alternatively, enter a sleep mode after the Flash page erase/write operation has been started, with NVMREADY as the only interrupt source.

Affected Silicon Revisions

Rev. B1
X

2.5 USART - Universal Synchronous and Asynchronous Receiver and Transmitter**2.5.1 Receiver Non-Functional after Detection of Inconsistent Synchronization Field**

The USART Receiver becomes non-functional when the Inconsistent Synchronization Field Interrupt Flag (ISFIF) in the Status (USARTn.STATUS) register is set. The ISFIF interrupt flag is set when the Receiver Mode (RXMODE) bit field in the Control B (USARTn.CTRLB) register is configured to Generic Auto-Baud (GENAUTO) or LIN Constrained Auto-Baud (LINAUTO) mode, and the received synchronization frame does not conform to the conditions described in the data sheet. Clearing the flag does not re-enable the USART Receiver.

Work Around

When the ISFIF interrupt flag is set, disable and re-enable the USART Receiver by first writing a '0' and then a '1' to the Receiver Enable (RXEN) bit in the Control B (USARTn.CTRLB) register.

Affected Silicon Revisions

Rev. B1

X

3. Data Sheet Clarifications

Note the following typographic corrections and clarifications for the latest version of the device data sheet (www.microchip.com/DS40002443).

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

3.1 Electrical Characteristics - RSTCTRL and BOD

A clarification has been made to change the Brown-out Detect Voltage (V_{BOD}) in the *Reset, WDT, Oscillator Start-up Timer, Power-up Timer, Brown-out Detector Specifications* table.

Table 35-15. Reset, WDT, Oscillator Start-up Timer, Power-up Timer, Brown-out Detector Specifications

Symbol	Description	Min.	Typ. †	Max.	Unit	Conditions
t_{RST}^*	RESET pin pulse-width low to ensure a Reset	2.5	—	—	μs	
$R_{RST_UP}^*$	RESET pin pull-up resistor	—	35	—	$\text{k}\Omega$	
T_{OST}^*	Oscillator start-up timer period ⁽¹⁾	—	1024	—	cycles	
V_{BOD+}	Brown-out Detect Voltage, rising slope ⁽²⁾	—	1.75	—	V	BODLEVEL0
			1.90	2.10	V	BODLEVEL1
			2.60	2.80	V	BODLEVEL2
			4.30	4.60	V	BODLEVEL3
V_{BOD-}	Brown-out Detect Voltage, falling slope ⁽²⁾	1.62	1.75	—	V	BODLEVEL0
			1.80	1.90	V	BODLEVEL1
			2.43	2.60	V	BODLEVEL2
			4.05	4.30	V	BODLEVEL3
V_{BOD_HYS}	Brown-out Detect hysteresis	—	25	—	mV	
t_{BOD_ST}	Brown-out Detect start-up time from sleep	—	30	—	μs	
t_{BOD}	BOD sampling time when used in Sampling mode	—	$1/f_{BOD}$	—	ms	
t_{BOD_RST}	Brown-out Reset response time	—	4	—	μs	$V_{DD} = V_{BOD} - 0.1\text{V}$

† Data in the "Typ." column is at $T_A = 25^\circ\text{C}$ and $V_{DD} = 3.0\text{V}$ unless otherwise specified. These parameters are not tested and are for design guidance only.

* These parameters are characterized but not tested in production.

Notes:

- By design, the Oscillator Start-up Timer (T_{OST}) counts the first 1024 cycles, independent of frequency.
- V_{DD} and GND must be capacitively decoupled as close to the device as possible to ensure these voltage tolerances. Recommended values are $0.1\ \mu\text{F}$ and $0.01\ \mu\text{F}$ in parallel.

4. Document Revision History

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

4.1 Revision History

Doc. Rev.	Date	Comments
A	02/2023	Initial document release

Microchip Information

The Microchip Website

Microchip provides online support via our website at www.microchip.com/. This website is used to make files and information easily available to customers. Some of the content available includes:

- **Product Support** – Data sheets and errata, application notes and sample programs, design resources, user's guides and hardware support documents, latest software releases and archived software
- **General Technical Support** – Frequently Asked Questions (FAQs), technical support requests, online discussion groups, Microchip design partner program member listing
- **Business of Microchip** – Product selector and ordering guides, latest Microchip press releases, listing of seminars and events, listings of Microchip sales offices, distributors and factory representatives

Product Change Notification Service

Microchip's product change notification service helps keep customers current on Microchip products. Subscribers will receive email notification whenever there are changes, updates, revisions or errata related to a specified product family or development tool of interest.

To register, go to www.microchip.com/pcn and follow the registration instructions.

Customer Support

Users of Microchip products can receive assistance through several channels:

- Distributor or Representative
- Local Sales Office
- Embedded Solutions Engineer (ESE)
- Technical Support

Customers should contact their distributor, representative or ESE for support. Local sales offices are also available to help customers. A listing of sales offices and locations is included in this document.

Technical support is available through the website at: www.microchip.com/support

Microchip Devices Code Protection Feature

Note the following details of the code protection feature on Microchip products:

- Microchip products meet the specifications contained in their particular Microchip Data Sheet.
- Microchip believes that its family of products is secure when used in the intended manner, within operating specifications, and under normal conditions.
- Microchip values and aggressively protects its intellectual property rights. Attempts to breach the code protection features of Microchip product is strictly prohibited and may violate the Digital Millennium Copyright Act.
- Neither Microchip nor any other semiconductor manufacturer can guarantee the security of its code. Code protection does not mean that we are guaranteeing the product is "unbreakable". Code protection is constantly evolving. Microchip is committed to continuously improving the code protection features of our products.

Legal Notice

This publication and the information herein may be used only with Microchip products, including to design, test, and integrate Microchip products with your application. Use of this information in any other manner violates these terms. Information regarding device applications is provided only for your convenience and may be superseded

by updates. It is your responsibility to ensure that your application meets with your specifications. Contact your local Microchip sales office for additional support or, obtain additional support at www.microchip.com/en-us/support/design-help/client-support-services.

THIS INFORMATION IS PROVIDED BY MICROCHIP "AS IS". MICROCHIP MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND WHETHER EXPRESS OR IMPLIED, WRITTEN OR ORAL, STATUTORY OR OTHERWISE, RELATED TO THE INFORMATION INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY, AND FITNESS FOR A PARTICULAR PURPOSE, OR WARRANTIES RELATED TO ITS CONDITION, QUALITY, OR PERFORMANCE.

IN NO EVENT WILL MICROCHIP BE LIABLE FOR ANY INDIRECT, SPECIAL, PUNITIVE, INCIDENTAL, OR CONSEQUENTIAL LOSS, DAMAGE, COST, OR EXPENSE OF ANY KIND WHATSOEVER RELATED TO THE INFORMATION OR ITS USE, HOWEVER CAUSED, EVEN IF MICROCHIP HAS BEEN ADVISED OF THE POSSIBILITY OR THE DAMAGES ARE FORESEEABLE. TO THE FULLEST EXTENT ALLOWED BY LAW, MICROCHIP'S TOTAL LIABILITY ON ALL CLAIMS IN ANY WAY RELATED TO THE INFORMATION OR ITS USE WILL NOT EXCEED THE AMOUNT OF FEES, IF ANY, THAT YOU HAVE PAID DIRECTLY TO MICROCHIP FOR THE INFORMATION.

Use of Microchip devices in life support and/or safety applications is entirely at the buyer's risk, and the buyer agrees to defend, indemnify and hold harmless Microchip from any and all damages, claims, suits, or expenses resulting from such use. No licenses are conveyed, implicitly or otherwise, under any Microchip intellectual property rights unless otherwise stated.

Trademarks

The Microchip name and logo, the Microchip logo, Adaptec, AVR, AVR logo, AVR Freaks, BesTime, BitCloud, CryptoMemory, CryptoRF, dsPIC, flexPWR, HELDO, IGLOO, JukeBlox, KeeLoq, Kleer, LANCheck, LinkMD, maXStylus, maXTouch, MediaLB, megaAVR, Microsemi, Microsemi logo, MOST, MOST logo, MPLAB, OptoLyzer, PIC, picoPower, PICSTART, PIC32 logo, PolarFire, Prochip Designer, QTouch, SAM-BA, SenGenuity, SpyNIC, SST, SST Logo, SuperFlash, Symmetricom, SyncServer, Tachyon, TimeSource, tinyAVR, UNI/O, Vectron, and XMEGA are registered trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

AgileSwitch, APT, ClockWorks, The Embedded Control Solutions Company, EtherSynch, Flashtec, Hyper Speed Control, HyperLight Load, Libero, motorBench, mTouch, Powermite 3, Precision Edge, ProASIC, ProASIC Plus, ProASIC Plus logo, Quiet-Wire, SmartFusion, SyncWorld, Temux, TimeCesium, TimeHub, TimePictra, TimeProvider, TrueTime, and ZL are registered trademarks of Microchip Technology Incorporated in the U.S.A.

Adjacent Key Suppression, AKS, Analog-for-the-Digital Age, Any Capacitor, AnyIn, AnyOut, Augmented Switching, BlueSky, BodyCom, Clockstudio, CodeGuard, CryptoAuthentication, CryptoAutomotive, CryptoCompanion, CryptoController, dsPICDEM, dsPICDEM.net, Dynamic Average Matching, DAM, ECAN, Espresso T1S, EtherGREEN, GridTime, IdealBridge, In-Circuit Serial Programming, ICSP, INICnet, Intelligent Paralleling, IntellIMOS, Inter-Chip Connectivity, JitterBlocker, Knob-on-Display, KoD, maxCrypto, maxView, memBrain, Mindi, MiWi, MPASM, MPF, MPLAB Certified logo, MPLIB, MPLINK, MultiTRAK, NetDetach, Omniscient Code Generation, PICDEM, PICDEM.net, PICkit, PICtail, PowerSmart, PureSilicon, QMatrix, REAL ICE, Ripple Blocker, RTAX, RTG4, SAM-ICE, Serial Quad I/O, simpleMAP, SimpliPHY, SmartBuffer, SmartHLS, SMART-I.S., storClad, SQL, SuperSwitcher, SuperSwitcher II, Switchtec, SynchroPHY, Total Endurance, Trusted Time, TSHARC, USBCheck, VariSense, VectorBlox, VeriPHY, ViewSpan, WiperLock, XpressConnect, and ZENA are trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

SQTP is a service mark of Microchip Technology Incorporated in the U.S.A.

The Adaptec logo, Frequency on Demand, Silicon Storage Technology, and Symmcom are registered trademarks of Microchip Technology Inc. in other countries.

GestIC is a registered trademark of Microchip Technology Germany II GmbH & Co. KG, a subsidiary of Microchip Technology Inc., in other countries.

All other trademarks mentioned herein are property of their respective companies.

© 2023, Microchip Technology Incorporated and its subsidiaries. All Rights Reserved.

ISBN: 978-1-6683-1103-5

Quality Management System

For information regarding Microchip's Quality Management Systems, please visit www.microchip.com/quality.

Worldwide Sales and Service

AMERICAS	ASIA/PACIFIC	ASIA/PACIFIC	EUROPE
Corporate Office 2355 West Chandler Blvd. Chandler, AZ 85224-6199 Tel: 480-792-7200 Fax: 480-792-7277 Technical Support: www.microchip.com/support Web Address: www.microchip.com	Australia - Sydney Tel: 61-2-9868-6733 China - Beijing Tel: 86-10-8569-7000 China - Chengdu Tel: 86-28-8665-5511 China - Chongqing Tel: 86-23-8980-9588 China - Dongguan Tel: 86-769-8702-9880 China - Guangzhou Tel: 86-20-8755-8029 China - Hangzhou Tel: 86-571-8792-8115 China - Hong Kong SAR Tel: 852-2943-5100 China - Nanjing Tel: 86-25-8473-2460 China - Qingdao Tel: 86-532-8502-7355 China - Shanghai Tel: 86-21-3326-8000 China - Shenyang Tel: 86-24-2334-2829 China - Shenzhen Tel: 86-755-8864-2200 China - Suzhou Tel: 86-186-6233-1526 China - Wuhan Tel: 86-27-5980-5300 China - Xian Tel: 86-29-8833-7252 China - Xiamen Tel: 86-592-2388138 China - Zhuhai Tel: 86-756-3210040	India - Bangalore Tel: 91-80-3090-4444 India - New Delhi Tel: 91-11-4160-8631 India - Pune Tel: 91-20-4121-0141 Japan - Osaka Tel: 81-6-6152-7160 Japan - Tokyo Tel: 81-3-6880-3770 Korea - Daegu Tel: 82-53-744-4301 Korea - Seoul Tel: 82-2-554-7200 Malaysia - Kuala Lumpur Tel: 60-3-7651-7906 Malaysia - Penang Tel: 60-4-227-8870 Philippines - Manila Tel: 63-2-634-9065 Singapore Tel: 65-6334-8870 Taiwan - Hsin Chu Tel: 886-3-577-8366 Taiwan - Kaohsiung Tel: 886-7-213-7830 Taiwan - Taipei Tel: 886-2-2508-8600 Thailand - Bangkok Tel: 66-2-694-1351 Vietnam - Ho Chi Minh Tel: 84-28-5448-2100	Austria - Wels Tel: 43-7242-2244-39 Fax: 43-7242-2244-393 Denmark - Copenhagen Tel: 45-4485-5910 Fax: 45-4485-2829 Finland - Espoo Tel: 358-9-4520-820 France - Paris Tel: 33-1-69-53-63-20 Fax: 33-1-69-30-90-79 Germany - Garching Tel: 49-8931-9700 Germany - Haan Tel: 49-2129-3766400 Germany - Heilbronn Tel: 49-7131-72400 Germany - Karlsruhe Tel: 49-721-625370 Germany - Munich Tel: 49-89-627-144-0 Fax: 49-89-627-144-44 Germany - Rosenheim Tel: 49-8031-354-560 Israel - Ra'anana Tel: 972-9-744-7705 Italy - Milan Tel: 39-0331-742611 Fax: 39-0331-466781 Italy - Padova Tel: 39-049-7625286 Netherlands - Drunen Tel: 31-416-690399 Fax: 31-416-690340 Norway - Trondheim Tel: 47-72884388 Poland - Warsaw Tel: 48-22-3325737 Romania - Bucharest Tel: 40-21-407-87-50 Spain - Madrid Tel: 34-91-708-08-90 Fax: 34-91-708-08-91 Sweden - Gothenberg Tel: 46-31-704-60-40 Sweden - Stockholm Tel: 46-8-5090-4654 UK - Wokingham Tel: 44-118-921-5800 Fax: 44-118-921-5820
Atlanta Duluth, GA Tel: 678-957-9614 Fax: 678-957-1455 Austin, TX Tel: 512-257-3370 Boston Westborough, MA Tel: 774-760-0087 Fax: 774-760-0088 Chicago Itasca, IL Tel: 630-285-0071 Fax: 630-285-0075 Dallas Addison, TX Tel: 972-818-7423 Fax: 972-818-2924 Detroit Novi, MI Tel: 248-848-4000 Houston, TX Tel: 281-894-5983 Indianapolis Noblesville, IN Tel: 317-773-8323 Fax: 317-773-5453 Tel: 317-536-2380 Los Angeles Mission Viejo, CA Tel: 949-462-9523 Fax: 949-462-9608 Tel: 951-273-7800 Raleigh, NC Tel: 919-844-7510 New York, NY Tel: 631-435-6000 San Jose, CA Tel: 408-735-9110 Tel: 408-436-4270 Canada - Toronto Tel: 905-695-1980 Fax: 905-695-2078			