

MCP7941X Family Silicon Errata

The MCP7941X family devices that you have received conform functionally to the current Device Data Sheet (DS20002266K), except for the anomalies described in this document.

The silicon issues discussed in the following pages are for devices listed in [Table 1](#). The silicon issues are summarized in [Table 2](#).

The errata described in this document will be addressed in future revisions of the MCP7941X silicon.

TABLE 1: AFFECTED PART NUMBERS

Part Number
MCP79410
MCP79411
MCP79412

Note: This document summarizes all silicon errata issues from all revisions of silicon, previous as well as current. Only the issues indicated in the last column of [Table 2](#) apply to the current silicon revision.

Note: For more information on identifying the product date code, refer to the Packaging Information section of the product data sheet or contact your local Microchip sales office.

TABLE 2: SILICON ISSUE SUMMARY

Issue Number	Issue Summary	Affected Date Codes ^(1, 2)		
		≤1109	≤1352	>1352
1	AM/PM bit modified when OSCRUN is cleared.	X		
2	High operating current following Stop condition.	X	X	
3	Date incrementing at noon.	X	X	X
4	Spurious Minute-Match or Hour-Match Alarm Interrupts.	X	X	X
5	Date value changing on month or year writes.	X	X	X
6	Day of week register value changing after write.	X	X	X

Note 1: Only those issues indicated in the last column apply to the current silicon revision.

2: The date codes are presented in YYWW format.

Silicon Errata Issues

Note: This document summarizes all silicon errata issues from all revisions of silicon, previous as well as current. Only the issues indicated by the shaded column in the following tables apply to the current silicon revision.

1. Issue: AM/PM Bit

If the oscillator is stopped for longer than a period of T_{OSF} , then the $OSCRUN$ bit ($RTCWKDAY<5>$) will be cleared. This may cause the $AM/PM/HRTEN1$ bit ($RTCHOUR<5>$) to toggle. This can occur in both 12-hour and 24-hour modes.

The oscillator can stop for any of the following reasons:

- The oscillator stops in the application.
- When using an external crystal, the ST bit ($RTCSEC<7>$) is cleared by the user.
- When using an external clock source, the $EXTOSC$ bit ($CONTROL<3>$) is cleared by the user.

Work around

If the $OSCRUN$ bit is cleared, then the oscillator has stopped, and the time and date values may no longer be valid. Therefore, before restarting the oscillator, the application should fetch and load the current time and date.

Affected date codes

≤ 1109	≤ 1352	> 1352
X		

2. Issue: Operating Current

When operating from V_{CC} , the operating current may slowly increase and can exceed the data sheet limits. The time necessary for the current to increase and stabilize can range from a few seconds to a few minutes. Operation from V_{BAT} is not affected.

Work around

The reception of an EEPROM control byte will briefly reset the V_{CC} current to below the data sheet limits. A sequence consisting of a Start condition, an EEPROM write control byte, and a Stop condition can be repeated periodically to reduce the current.

Affected date codes

≤ 1109	≤ 1352	> 1352
X	X	

3. Issue: Date Increment

When operating in 12-hour mode ($RTCHOUR<6>$ is set), if the application loads an hour value before 12:00 PM while the oscillator is running, then the date and day of week may increment at 12:00 PM. When this occurs, the month and year will also increment according to the normal rollover rules. The date will increment again at 12:00 AM.

Work around

Disable the oscillator by ensuring both the ST and $EXTOSC$ bits are cleared, and wait for the $OSCRUN$ bit to clear before loading the new hour value.

Affected date codes

≤ 1109	≤ 1352	> 1352
X	X	X

4. Issue: Spurious Minute-Match or Hour-Match Alarm Interrupts

When using an alarm to match on minutes ($ALMxMSK<2:0> = 001$) or hours ($ALMxMSK<2:0> = 010$) and digital trimming is being used to slow down the time ($TRIMVAL<6:0> > 0$ and $SIGN = 0$), spurious alarm interrupts may occur at incorrect minutes or hours.

Work around

If possible, avoid using digital trimming ($TRIMVAL = 0x00$). Otherwise, when an alarm interrupt occurs, read the $RTCMIN$ and $RTCHOUR$ register, and confirm that the minutes and hours match the desired values for the alarm.

Affected date codes

≤ 1109	≤ 1352	> 1352
X	X	X

5. Issue: Date Value Changing on Month or Year Writes

When writing a new value in the Year, Month or Date registers, the Date register value may change unexpectedly.

Work around

If any of the Date, Month or Year values need to be changed, write new Date, Month and Year values in that order (this write can be a continuous or discontinuous operation). Then,

write Date value again. The ST bit can remain set during this operation, or it can be cleared and set again afterward.

Affected date codes

≤ 1109	≤ 1352	> 1352
X	X	X

6. Issue: Day of Week Register Value Changing After Write

If the RTCWKDAY register is written while the oscillator is stopped, it is possible that the value will read back as a different value after the oscillator is started.

Work around

After writing to the RTCWKDAY register, read the value back after the oscillator is started to confirm it is correct and, if necessary, rewrite it.

Affected date codes

≤ 1109	≤ 1352	> 1352
X	X	X

APPENDIX A: DOCUMENT REVISION HISTORY

Revision F (01/2025)

Added Silicon Issue 4 (Spurious Minute-Match or Hour-Match Alarm Interrupts).

Revision E (07/2022)

Edited Issue 5.

Revision D (10/2018)

Added Silicon Issue 6 (Day of Week Register Value Changing After Write).

Revision C (02/2018)

Added Silicon Issue 5 (Date Value Changing on Month Write).

Revision B (12/2015)

Added Silicon Issue 4 (Spurious Alarm Interrupts When Matching on Minutes).

Revision A (03/2014)

Initial release of this document.

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ISBN: 979-8-3371-0471-3

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