



Product Change Notification / SYST-28DSPA532

Date:

30-Mar-2023

Product Category:

8-bit Microcontrollers

PCN Type:

Document Change

Notification Subject:

ERRATA - PIC18F27/47/57Q43 Silicon Errata and Data Sheet Clarifications

Affected CPNs:

[SYST-28DSPA532_Affected_CPN_03302023.pdf](#)

[SYST-28DSPA532_Affected_CPN_03302023.csv](#)

Notification Text:

SYST-28DSPA532

Microchip has released a new Errata for the PIC18F27/47/57Q43 Silicon Errata and Data Sheet Clarifications of devices. If you are using one of these devices please read the document located at [PIC18F27/47/57Q43 Silicon Errata and Data Sheet Clarifications](#).

Notification Status: Final

Description of Change:

- 1) Added silicon revision C0 and silicon errata item 1.3.3.
- 2) Updated data sheet revision to revision G and removed previous clarification issues.

Impacts to Data Sheet: None

Reason for Change: To Improve Productivity

Change Implementation Status: Complete

Estimated First Ship Date: 30 March 2023

NOTE: Please be advised that after the estimated first ship date customers may receive pre and post change parts.

Markings to Distinguish Revised from Unrevised Devices: Traceability Code

Attachments:

[PIC18F27/47/57Q43 Silicon Errata and Data Sheet Clarifications](#)

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Affected Catalog Part Numbers (CPN)

PIC18F27Q43-E/SO
PIC18F27Q43-E/SP
PIC18F27Q43-E/SS
PIC18F27Q43-E/STX
PIC18F27Q43-I/SO
PIC18F27Q43-I/SP
PIC18F27Q43-I/SS
PIC18F27Q43-I/STX
PIC18F27Q43T-I/SO
PIC18F27Q43T-I/SS
PIC18F27Q43T-I/STX
PIC18F47Q43-E/MP
PIC18F47Q43-E/P
PIC18F47Q43-E/PT
PIC18F47Q43-I/MP
PIC18F47Q43-I/P
PIC18F47Q43-I/PT
PIC18F47Q43T-I/MP
PIC18F47Q43T-I/PT
PIC18F57Q43-E/6LX
PIC18F57Q43-E/PT
PIC18F57Q43-I/6LX
PIC18F57Q43-I/PT
PIC18F57Q43T-E/6LX
PIC18F57Q43T-I/6LX
PIC18F57Q43T-I/PT
PIC18F57Q43T-I/PTC01

PIC18F27/47/57Q43 Silicon Errata and Data Sheet Clarifications

The PIC18F27/47/57Q43 devices you have received conform functionally to the current device data sheet (DS40002147G), except for the anomalies described in this document.

The silicon issues discussed in the following pages are for silicon revisions with the Device and Revision IDs listed in the table below.

The errata described in this document will be addressed in future revisions of the PIC18F27/47/57Q43 silicon.

Note: This document summarizes all silicon errata issues from all revisions of silicon, previous as well as current.

Table 1. Silicon Device Identification

Part Number	Device ID	Revision ID			
		B0	B2	B3	C0
PIC18F27Q43	0x7480	0xA040	0xA042	0xA043	0xA080
PIC18F47Q43	0x74A0	0xA040	0xA042	0xA043	0xA080
PIC18F57Q43	0x74C0	0xA040	0xA042	0xA043	0xA080



Important: Refer to the **Device/Revision ID** section in the current “**PIC18FXXQ43 Family Programming Specification**” (DS40002079) for more detailed information on Device Identification and Revision IDs for your specific device.

Table 2. Silicon Issue Summary

Module	Feature	Item No.	Issue Summary	Affected Revisions			
				B0	B2	B3	C0
ADCC	Capacitive Voltage Divider	1.1.1	CVD is only functional on PORTA[2:0] and PORTB[4:0]	X			
ADCC	Double Sample Conversions	1.1.2	An unexpected acquisition time is added between the first and second conversions.	X	X	X	X
Oscillator	XT mode	1.2.1	Maximum clock frequency limited to 2 MHz for XT mode	X	X		
I ² C	I ² C	1.3.1	The I2CxADR0/1/2/3 registers have incorrect Reset value	X	X	X	
I ² C	I ² C	1.3.2	The I ² C Start and/or Stop flags may be set when I ² C is enabled	X	X	X	
I ² C	Multi-Master mode	1.3.3	Multi-Master mode will cause bus failures	X	X	X	X
SRAM	SRAM read-back	1.4.1	SRAM read-back can be incorrect	X			
In-Circuit Debug	Software breakpoints	1.5.1	Software breakpoints are not available	X	X	X	X
SMT	Reset Bit	1.6.1	Module stops working if RST bit is set while prescaler setting is not zero	X	X	X	X
Universal Asynchronous Receiver Transmitter	UART	1.7.1	UART TXDE signal may go low before the STOP bit has been entirely transmitted	X	X	X	X

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

1. Silicon Errata Issues

CAUTION

Notice: This document summarizes all silicon errata issues from all revisions of silicon, previous and current. Only the issues indicated by the bold font in the following tables apply to the current silicon revision.

1.1 Module: Analog-to-Digital Converter with Computation (ADCC)

1.1.1 Capacitive Voltage Divider (CVD)

The CVD feature is only functional on PORTA[2:0] and PORTB[4:0]. This feature is not recommended for use on any other pins.

Work around
None.

Affected Silicon Revisions

B0	B2	B3	C0
X			

1.1.2 Double Sample Conversions

When enabling a Double Sample Conversion (DSEN = 1), with no Precharge time (ADPRE = 0) and no Acquisition time (ADACQ = 0), the maximum number of cycles of acquisition time is inserted prior to the second conversion. The first conversion will be performed as expected with no Precharge time and no Acquisition time. It is only between the first and second conversions where a maximum number of cycles of Acquisition time is performed unexpectedly.

Work around
Method 1:

Disable Double Sample Conversion (DSEN = 0) and perform two single conversions back to back.

Method 2:

If adding acquisition time is acceptable, then select no Precharge time, along with the desired Acquisition time.

Affected Silicon Revisions

B0	B2	B3	C0
X	X	X	X

1.2 Module: Oscillator (OSC)

1.2.1 Maximum Clock Frequency Limited to 2 MHz for XT Mode

The maximum clock frequency for the intermediate gain setting that supports quartz crystal and ceramic resonator operation (XT mode) is being reduced from 4 MHz to 2 MHz.

Work around
For crystal or resonator frequencies above 2 MHz, use HS mode.

Affected Silicon Revisions

B0	B2	B3	C0
X	X		

1.3 Module: Inter-Integrated Circuit (I²C)

1.3.1 The I2CxADR0/1/2/3 Registers Have Incorrect Reset Value

The I2CxADR0/2 registers reset to 0xFF when the I2CxMD is enabled instead of 0x00. The I2CxADR1/3 registers reset to 0xFE when the I2CxMD is enabled instead of 0x00.

Work around

None.

Affected Silicon Revisions

B0	B2	B3	C0
X	X	X	

1.3.2 The I²C Start and/or Stop Flags May Be Set When I²C Is Enabled

When I²C is enabled, erroneous Start and/or Stop conditions may be detected. This can generate erroneous I²C interrupts if enabled.

Work around

Use the following procedure to correctly detect the Start and Stop conditions:

1. Disable the Start and Stop conditions interrupt functions.
2. Enable the I²C module.
3. Wait 250 ns + six instructions cycles ($F_{OSC}/4$).
4. Clear the Start and Stop conditions interrupt flags.
5. Enable the Start and Stop conditions interrupt functions if used.

```

I2CxPIEBits.SCIE = 0;           // Disable Start condition interrupt
I2CxPIEBits.PCIE = 0;           // Disable Stop condition interrupt
I2CxCON0bits.EN = 1;           // Enable I2C
Delay();                         // Wait for 250 ns + 6 instruction cycles (FOSC/4)
I2CxPIRbits.SCIF = 0;           // Clear the Start condition interrupt flags
I2CxPIRbits.PCIF = 0;           // Clear the Stop condition interrupt flags
I2CxPIEBits.SCIE = 1;           // Enable Start condition interrupt if used
I2CxPIEBits.PCIE = 1;           // Enable Stop condition interrupt if used
    
```

Affected Silicon Revisions

B0	B2	B3	C0
X	X	X	

1.3.3 Operating in Multi-Master Mode Will Cause Bus Failures

If operating in Multi-Master Mode and a second master drives SDA low at the same time the Start bit is generated, the module will fail to go into Master mode, but will continue to send an address and data as if it won arbitration. I2CCNT fails to decrement, and the module will remain in this state until a bus timeout occurs or the device is reset.

Work around

None.

Affected Silicon Revisions

B0	B2	B3	C0
X	X	X	X

1.4 Module: SRAM**1.4.1 SRAM Read-Back**

Following a device power-up sequence, there is a possibility that some SRAM locations will not return the expected written value but will read back '00' instead.

Work around

None. The device can only recover by power cycling.

This erroneous condition can be detected by running the following code that writes nonzero values to SRAM and then verifies that the returned read values are not '00'. If a returned value is '00', the application code has to be put into a safe state until a POR event occurs. This code has to be executed immediately after power-up. If the test passes, the device operation will be normal.

```
// SRAM test
FSR0 = 0xcff;           // Write data into RAM address for devices up to 2K RAM
INDF0 = 0x55;
PROD = INDF0;          // Read back data
if (PROD == 0){
    SAFE_STATE();      // RAM incorrectly read, suspend operation and go to Safe state
}

//For devices with more than 2K of SRAM, add the following code
FSR0 = 0x14ff;         // Write data into RAM
INDF0 = 0x55;
PROD = INDF0;          // Read back data
if (PROD == 0){
    SAFE_STATE();      // RAM incorrectly read, suspend operation and go to Safe state
}

//For devices with more than 4K of SRAM, add the following code
FSR0 = 0x24ff;         // Write data into RAM
INDF0 = 0x55;
PROD = INDF0;          // Read back data
if (PROD == 0){
    SAFE_STATE();      // RAM incorrectly read, suspend operation and go to Safe state
}
```

Affected Silicon Revisions

B0	B2	B3	C0
X			

1.5 Module: In-Circuit Debug**1.5.1 Software Breakpoints Are Not Available**

When debugging code, software breakpoints will not be available.

Work around

None.

Affected Silicon Revisions

B0	B2	B3	C0
X	X	X	X

1.6 Module: Signal Measurement Timer (SMT)**1.6.1 Reset Bit**

If the SMT clock prescaler is set to any value other than '00', setting the RST bit will cause the module to stop working. The RST bit will remain at the value '1', the counter will not increment, and no interrupts will be generated. The problem is cleared by turning the module off and on, or by a device reset.

Work around**Method 1:**

Do not set the RST bit; manual reset is usually not required for typical operation because the measurement logic will reset the counter automatically.

Method 2:

Write zero to the counter manually. The module enable or the clock should be disabled when using this method.

Method 3:

Use 1:1 prescaler (PS = 00).

Method 4:

Use the CLKREF subsystem to provide a prescaled clock and set PS = 00.

Affected Silicon Revisions

B0	B2	B3	C0
X	X	X	X

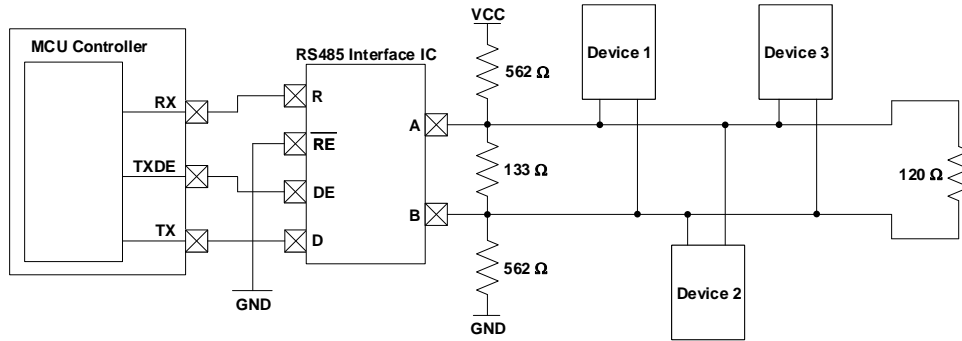
1.7 Module: Universal Asynchronous Receiver Transmitter (UART)**1.7.1 UART TXDE Signal May go Low Before The STOP Bit Has Been Entirely Transmitted.**

The UART Transmit Drive Enable (TXDE) signal could potentially transition into a low state before the UART STOP bit has been entirely transmitted due to the effects of parasitic capacitance on the TX line. In some applications, this could result in communication being prematurely terminated due to the TXDE bit going low before the STOP bit has had enough time to settle.

Work around

In order to ensure that the STOP bit settles into its final logic state before the TXDE signal transitions low, a biasing circuit can be implemented. A biasing circuit allows the TX line to either be driven high or low, rather than being left in a floating tri-state mode where prolonged rise or fall times could lead to communication being disrupted. This bias circuit should only be implemented on one end of the serial bus, and a termination resistor should be used on the other end. The figure below show an example of a bias circuit that can be used to achieve this.

Please note that the resistor values used in this circuit are recommendations, and that the actual resistor values required may vary based on the application.



Affected Silicon Revisions

B0	B2	B3	C0
X	X	X	X

2. Data Sheet Clarifications

The following typographic corrections and clarifications are to be noted for the latest version of the device data sheet (DS40002147G):

Note:

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

2.1 None

There are no known data sheet clarifications as of this publication date.

3. Appendix A: Revision History

Doc Rev.	Date	Comments
L	03/2023	Added silicon revision C0 and silicon errata item 1.3.3. Updated data sheet revision to revision G and removed previous clarification issues.
K	03/2022	Added silicon errata items 1.1.2, 1.6.1, 17.1 and data sheet clarifications 2.1 and 2.2
J	07/2021	Added silicon erratum item 1.3.2
H	03/2021	Added silicon erratum item 1.5.1; deleted data sheet clarification 2.1
G	10/2020	Added silicon revision B3 and UART Transmit Collision Interrupt data sheet clarification; updated silicon erratum item 1.3.1
F	08/2020	Added silicon revision B2
E	06/2020	Added silicon erratum item 1.4.1
D	06/2020	Added silicon erratum item 1.3.1
C	04/2020	Added XT mode erratum and Temperature Indicator data sheet clarification
B	02/2020	Added working pins for CVD
A	12/2019	Initial document release

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