

MCP98242 Rev. A1 Silicon Errata

The MCP98242 family devices that you have received conform functionally to the current Device Data Sheet (DS21996B), except for the anomalies described in this document.

Devices on or after date code 0847 correct this issue.

Data Sheet Clarifications

The following typographic corrections and clarifications are to be noted for the latest version of the device data sheet (DS21996B):

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

1. Module: Sensor Temperature Register Update

The MCP98242 device has internal intermittent timing issue.

Under the specific boundary conditions listed below, the 2 byte temperature register T_A may contain temperature data $+16^\circ\text{C}$ or -16°C from the nominal temperature due to internal data synchronization issue.

Conditions:

- a) If the Lower Byte of the T_A register rolls up or down:
 - from `'1111 1100'b` to `'0000 0000'b`
 - from `'0000 0000'b` to `'1111 1100'b`
- b) If the internal ADC conversion completes ($T_{\text{CONV}} = 65 \text{ ms}$) while the Upper Byte is in transmission via the $I^2\text{C}$ bus.

Under these two conditions, the temperature reading may jump up or down by 16°C .

For example, if the previous temperature conversion is 31.75°C (byte 1 = `'0000 0001'b` and byte 2 = `'1111 1100'b`) and if the next temperature conversion from the internal ADC is complete after T_{CONV} with 32.00°C (byte 1 = `'0000 0010'b` and byte 2 = `'0000 0000'b`) while byte 1 `'0000 0001'b` from previous conversion is in transmission via $I^2\text{C}$ to the host controller, then byte 2 can be over written by the second byte of the latest conversion data of `'0000 0000'b`. In this case, the host controller would read 16°C (byte 1 = `'0000 0001'b` and byte 2 = `'0000 0000'b`). Also, if the above conditions are met with the previous temperature conversion at 32.00°C and the next temperature conversion is 31.75°C , the host controller would read 48.75°C .

Byte 1 must be in $I^2\text{C}$ transmission for this issue to occur and the ADC must complete conversion while $I^2\text{C}$ is in communication. In addition, the ambient temperature must be at multiples of $16^\circ\text{C} \pm 0.25^\circ\text{C}$ for the temperature register to be partially overwritten.

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Figure 1 shows flow diagram describing the specific conditions for the synchronization issue occurs. Table 1 shows a complete list of temperatures greater than 0°C.

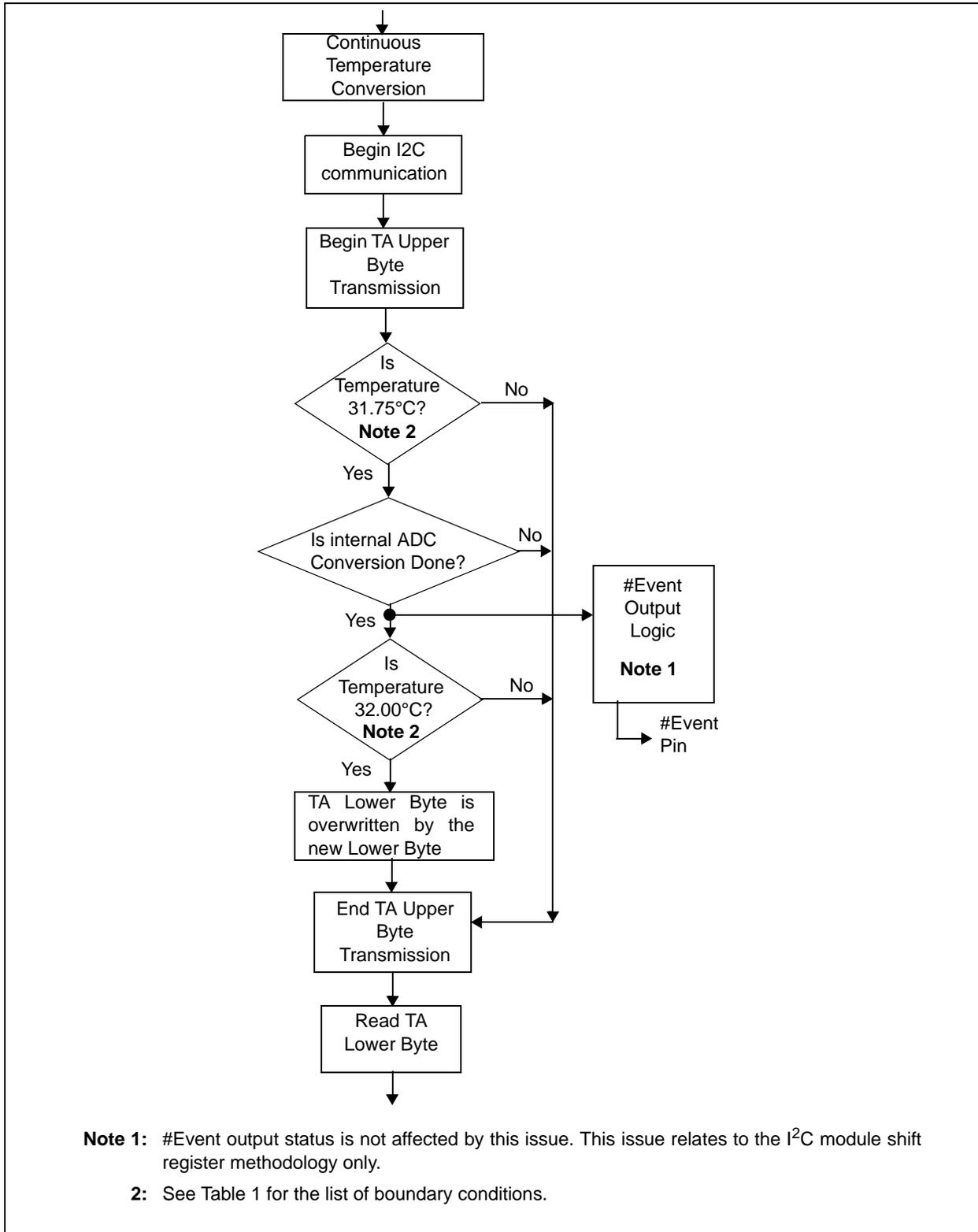


FIGURE 1: Flow Chart.

For temperature conditions other than Table 1, the device blocks data overwrite. Therefore, this issue will not occur.

TABLE 1: TEMPERATURE BOUNDARY CONDITIONS AND OUTPUT ERROR FOR TEMPERATURES > 0°C

Previous Temperature		Next Temperature		Error	
°C	Binary	°C	Binary	°C	Binary
15.75	0000 0000 1111 1100	16.00	0000 0001 0000 0000	0	0000 0000 0000 0000
16.00	0000 0001 0000 0000	15.75	0000 0000 1111 1100	31.75	0000 0001 1111 1100
31.75	0000 0001 1111 1100	32.00	0000 0010 0000 0000	16	0000 0001 0000 0000
32.00	0000 0010 0000 0000	31.75	0000 0001 1111 1100	47.75	0000 0010 1111 1100
47.75	0000 0010 1111 1100	48.00	0000 0011 0000 0000	32.00	0000 0010 0000 0000
48.00	0000 0011 0000 0000	47.75	0000 0010 1111 1100	63.75	0000 0011 1111 1100
63.75	0000 0011 1111 1100	64.00	0000 0100 0000 0000	48.00	0000 0011 0000 0000
64.00	0000 0100 0000 0000	63.75	0000 0011 1111 1100	79.75	0000 0100 1111 1100
79.75	0000 0100 1111 1100	80.00	0000 0101 0000 0000	64.00	0000 0100 0000 0000
80.00	0000 0101 0000 0000	79.75	0000 0100 1111 1100	95.75	0000 0101 1111 1100
97.75	0000 0101 1111 1100	96.00	0000 0101 0000 0000	80.00	0000 0101 0000 0000
96.00	0000 0110 0000 0000	97.75	0000 0101 1111 1100	111.75	0000 0110 1111 1100
111.75	0000 0110 1111 1100	112.00	0000 0111 0000 0000	96.00	0000 0110 0000 0000
112.00	0000 0111 0000 0000	111.75	0000 0110 1111 1100	127.75	0000 0111 1111 1100

The #Event output condition

The data synchronization issue does not affect the #Event output status. The #Event output logic is not related to the I²C data transmission logic, therefore the #Event output will not false trigger. This issue is strictly related to the data transmission process with the host controller.

Work around

If the ambient temperature read is within the host temperature limit, then do nothing. Otherwise, if the new temperature read is greater than or less than the previous temperature data by exactly 16.00°C, then perform a Repeat Read to receive the correct temperature data. There is a 0% probability that the Repeat Read data would be corrupted, if the Repeat Read is performed within T_{CONV} (65 ms). If a Repeat Read is performed after 65 ms then there is a greater than 0% probability that the next conversion would also be corrupt by ±16.00°C as stated in Table 1. In this case, disregard this reading and perform a Repeat Read and compare the result with the last known good reading.

This workaround is Microchip's recommendation and it has not been endorsed by Intel or other OEMs. If necessary, OEMs can contact Microchip to discuss other firmware solutions.

Part Numbers that fix this issue

Devices on or after date code 0847 correct this issue. **The Device ID/Revision Register for these parts is set to 0x2000 hex.**

Devices on or after date code 0915 have an updated Device ID/Revision of 0x2001 hex.

These devices have been validated by Microchip Technology Inc. and Intel Corporation.

- MCP98242T-BE/MNYBA2
- MCP98242T-BE/MNYBAC
- MCP98242T-BE/MCBA2
- MCP98242T-BE/MCBAC
- MCP98242-BE/MCBA2

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APPENDIX A: DOCUMENT REVISION HISTORY

Rev A Document (1/2009)

- Initial Release of this Document.

Rev B Document (1/2009)

- Clarified initial workaround description and added additional verbiage to Part Numbers section.

Rev C Document (5/2009)

- Updated **Section “Part Numbers that fix this issue”** with date code for devices with Device/Rev ID register of 0x2001.

This document replaces this errata document:

- DS80431B, “MCP98242 Rev. A1 Silicon Errata”

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