

USB251xB/xBi Family Silicon Errata

The USB251xB/xBi family devices that you have received conform functionally to the current Device Data Sheet (DS00001692A), 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 [Table 1](#). The silicon issues are summarized in [Table 2](#).

Note: This document summarizes all silicon errata issues of the current silicon revision (**A2**).

The Engineering Device ID values for USB251xB/xBi silicon revision A2 is shown in [Table 1](#).

TABLE 1: SILICON DEVREV VALUES

Part Number	Engineer Device ID of A2
USB2512B-AEZC	A2P10
USB2512Bi-AEZC	A2P10
USB2512B/M2	A2P10
USB2512BT/M2	A2P10
USB2512B-I/M2	A2P10
USB2512BT-I/M2	A2P10
USB2513B-AEZC	A2P10
USB2513Bi-AEZC	A2P10
USB2513B/M2	A2P10
USB2513BT/M2	A2P10
USB2513B-I/M2	A2P10
USB2513BT-I/M2	A2P10
USB2514B-AEZG	A2P10
USB2514Bi-AEZG	A2P10
USB2514B/M2	A2P10
USB2514BT/M2	A2P10
USB2514B-I/M2	A2P10
USB2514BT-I/M2	A2P10

TABLE 2: SILICON ISSUE SUMMARY

Item Number	Silicon Issue Summary	Affected Silicon Revisions
1	bcdDevice field (DID) has invalid characters	A2
2	Selective Suspend command is ignored by the hub	A2
3	Glitch on DP (and SD/SCL) during power-up	A2
4	Detach detection failure	A2

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Silicon Errata Issues

Module 1: bcdDevice field (DID) has invalid characters

DESCRIPTION

According to the USB2.0 specification, the bcdDevice field is specified to be binary-coded-decimal, which means only decimal characters are allowed. The hexadecimal digits A-F are not allowed.

END USER IMPLICATIONS

The presence of non-BCD characters will cause failures in some Command Verifier (CV) and Windows Hardware Certification tests, such as:

- USB (USBDEX) Verifier Test
- USB Device Connection S3 + S4
- USB Driver Level Re-Enumeration Test
- USB Enumeration Stress
- USB Serial Number

No end user functional impact.

Work around

This bcdDevice field can be changed through the configuration options by programming EEPROM via SMBus or I²C interface. Also, a Microsoft Contingency number 323 can be used to waive five mentioned tests above in the Windows Hardware Certification test suite.

PLAN

This erratum will not be corrected in a future revision.

Module 2: Selective Suspend command is ignored by the hub

DESCRIPTION

If a SET_FEATURE (PORT_SUSPEND) command is sent right after the SOF command (microframe 0), the hub will not disable the port.

END USER IMPLICATIONS

The port will not suspend when a command is sent by the host. This will cause more current draw than if the port was suspended (~10mA).

Work around

It is recommended to use the Global Suspend function to put the entire hub into suspend to conserve power.

PLAN

This erratum will not be corrected in a future revision.

Module 3: Glitch on DP (and SD/SCL) during power-up

DESCRIPTION

When the Hub is powering up, the DP pin is asserted before other internal logic has started. When the internal logic does start, it can cause a low pulse on the SMBus and DP pins.

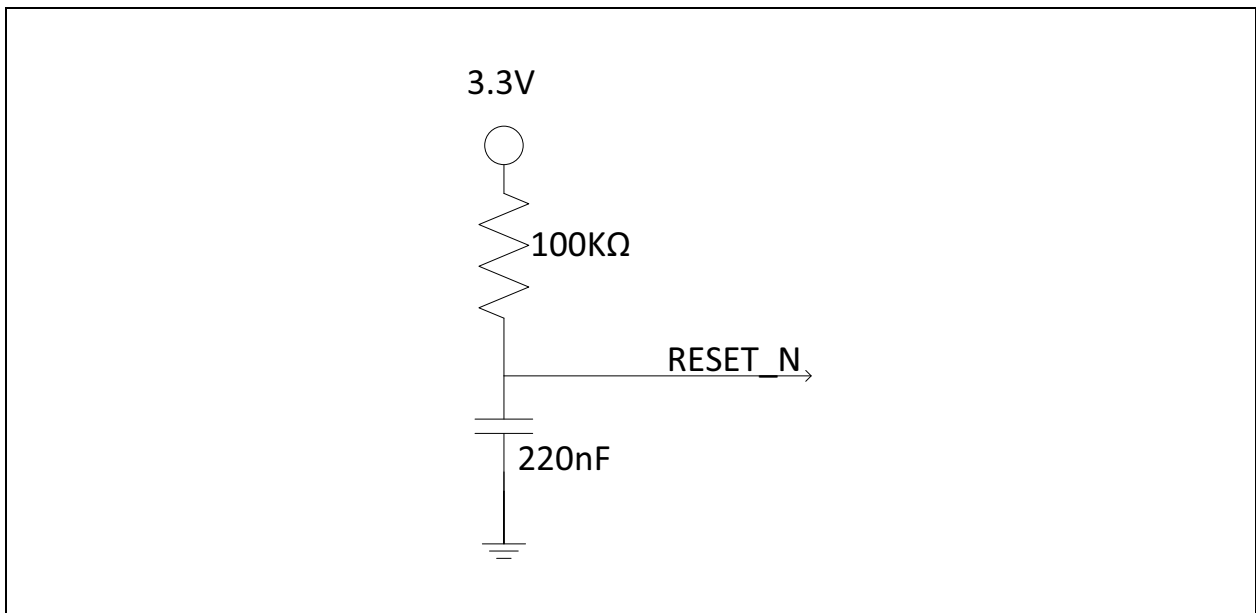
END USER IMPLICATIONS

The USB protocol can handle a glitch on DP, so no user impact on the USB lines. The SMBus glitch can impact the state machine of the SMBus Controller.

Work around

Keep the RESET_N pin low during POR to remove this glitch. Control RESET_N through a digital controller or an RC circuit by connecting a 100K Ω pull-up resistor to 3.3V and a 220nF capacitor to ground. See RC circuit diagram below.

FIGURE 1: RC CIRCUIT DIAGRAM



PLAN

This erratum will not be corrected in a future revision.

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Module 4: Detach detection failure

DESCRIPTION

When a Full-Speed/Low-Speed device detaches and quickly re-attaches, such as when issued a reset command over USB or other sideband control signal, there is a chance that the USB hub will not recognize the device detach and communicate the device detach event to the USB host. This may result in a failure to establish a connection with the device after the device is re-attached.

The hub requires 100us of uninterrupted SE0 line state (both D+ and D- lines below $V_{IL(min)}$) before a device detach is detected.

END USER IMPLICATIONS

This issue does not typically apply to a physical detach, as a physical device detach and re-attach typically involves much longer time scales.

This issue may be encountered when a device performs a self detach and re-attach as a result of some special command over USB or a reset due to some stimulus within the device's system (such as a button reset).

Work around

There are two possible work arounds:

1. Ensure that the hub port detects an SE0 line state for $> 100\mu s$ before re-attaching the device.
 - a) The device must remove its D+ or D- pull-up resistor to ensure SE0 line state is achieved.
 - b) There must be at least one $100\mu s$ gap in between packets while the device is in the detached state.
2. If the device is being commanded to detach and re-attach from USB host command (such as when instructing a device to re-enumerate in a different mode of operation), issue a Port Reset command to the hub for the respective port immediately after the detach command is issued to ensure that the device can be properly detected when it re-attaches.

PLAN

This erratum will not be corrected in a future revision.

APPENDIX A: DOCUMENT REVISION HISTORY

TABLE A-1: REVISION HISTORY

Revision Level & Date	Section/Figure/Entry	Correction
DS80000627D (03-19-19)	Module 4	Added new errata module " Detach detection failure ".
	All	Updated layout to standard Microchip format.
DS80000627C (09-15-15)	Table 1	Added additional device part numbers to table for SQFN package. No new errata added.
DS80000627B (11-07-14)		Initial release.

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