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USB70xx

USB7002/USB7006/USB7016/USB7052N Silicon Errata

This document describes known silicon errata for the USB7002, USB7006, USB7016, and USB7052N devices. The silicon errata discussed in this document are for silicon revisions as listed in Table 1. A summary of USB70xx silicon errata is provided in Table 2.

TABLE 1: AFFECTED SILICON REVISIONS

Part Numbers	Silicon Revision
USB7002, USB7006, USB7016, USB7052N	B0

TABLE 2: SILICON ISSUE SUMMARY

Item Number	Silicon Issue Summary
1.	Ganged port power control mode limitations
2.	Incompatibility issue with SST25 series SPI flash devices
3.	Undefined SMBus OTP access commands execute an OTP read
4.	Unsupported ‘Set Interface’ command does not issue a STALL response
5.	Suspend Current Consumption delta between SPI FW execution and ROM FW execution
6.	VCONN overcurrent loops infinite retries while in DCP mode
7.	Invalid memory region access is not blocked
8.	Force DCP feature overcurrent bug
9.	Multi-Host Endpoint Reflector cannot be used on downstream ports 5 and 6
10.	I2C SCL may remain low after malformed I2C bus signaling

Silicon Errata Issues

Module 1: Ganged port power control mode limitations

DESCRIPTION

“Ganged mode” port power control is not recommended when using Type-C ports, as Type-C ports require individual VBUS enable controls to operate in a fully compliant way. The hub should only be configured for “ganged mode” operation if all of the downstream ports are re-configured for legacy Type-A operation via the PORT_CFG_SEL register.

END USER IMPLICATIONS

None. Ganged port power control mode should not be used if any downstream ports are configured as Type-C ports.

Work Around

None.

PLAN

There is no plan to address this item.

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Module 2: Incompatibility issue with SST25 series SPI flash devices

DESCRIPTION

The Hub ROM firmware fails to retrieve the JEDEC ID for SST25 series SPI Flash when hub has booted and is executing the firmware from the SPI Flash device. The resulting issue is that attempts to program the pseudo-OTP memory space within the SPI flash device will fail. It is possible to program the pseudo OTP when running from ROM

END USER IMPLICATIONS

Updating the pseudo-OTP memory will not work in the standard way when running and external firmware image from an SST25 series SPI flash.

Work Around

If running the firmware image from an external SST25 series SPI Flash device, and it is required to update the pseudo-OTP, the hub must be forced to reset and boot from internal ROM firmware image first. The pseudo OTP of the SPI Flash can then be updated while the hub is running from internal ROM firmware.

PLAN

There is no plan to address this item.

Module 3: Undefined SMBus OTP access commands execute an OTP read

DESCRIPTION

The OTP Read via SMBus command is 0x07. Commands 0x0A - 0xFF are undefined commands, but operate as OTP Read if issued.

END USER IMPLICATIONS

If undefined SMBus OTP commands 0x0A to 0xFF are issued, then an OTP Read will occur. This should have no negative impact on any applications.

Work Around

None.

PLAN

There is no plan to address this item.

Module 4: Unsupported ‘Set Interface’ command does not issue a STALL response

DESCRIPTION

When configuring an unsupported firmware interface & alternate setting combination through a SET_INTERFACE command from host to the hub’s internal Hub Feature Controller device (UDC0), the Hub Feature Controller will not issue a STALL response.

END USER IMPLICATIONS

None. The end user should never issue unsupported SET_INTERFACE commands.

Work Around

None.

PLAN

There is no plan to address this item.

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Module 5: Suspend Current Consumption delta between SPI FW execution and ROM FW execution

DESCRIPTION

Suspend current of the hub is typically 16 mA when running from internal ROM firmware, and 11.8 mA when running from external SPI firmware.

END USER IMPLICATIONS

While power consumption of the hub IC while in suspend is higher when running from internal ROM firmware image than with an external SPI firmware image, the total system power consumption may still lower when executing from internal ROM firmware image because this figure does not take into account the amount of power required to power a SPI Flash device.

Work Around

None.

PLAN

There is no plan to address this item.

Module 6: VCONN overcurrent loops infinite retries while in DCP mode

DESCRIPTION

When a USB port has battery charging enabled, and the port is in the DCP state (no USB host is present), a persistent fault on the VCONN supply will retry endlessly.

For comparison, if a persistent fault has been detected on VBUS while in the DCP state, the hub will latch off VBUS after several consecutive failed retries.

END USER IMPLICATIONS

A consumer with a defective electronically marked cable may observe constant toggling of power to the attached device. This may result in rapid appearance and disappearance of a charging icon or indicator on an attached device.

Work Around

Use the latest firmware version executed externally from a connected SPI Flash memory.

PLAN

This issue has been fixed in an updated firmware release. The latest firmware release may be loaded to an external SPI flash device and executed by the hub. There is no plan to update the hub ROM firmware image at this time.

Module 7: Invalid memory region access is not blocked

DESCRIPTION

The hub firmware does not prevent access for the invalid memory region 0xBF90_0000 - 0xBF90_2FFF. Attempting to access this memory region will result in a firmware exception.

END USER IMPLICATIONS

None. These memory addresses have no use, and should never be accessed in a normal application.

Work Around

Use the latest firmware version executed externally from a connected SPI Flash memory.

PLAN

This issue has been fixed in an updated firmware release. The latest firmware release may be loaded to an external SPI flash device and executed by the hub. There is no plan to update the hub ROM firmware image at this time.

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Module 8: Force DCP feature overcurrent bug

DESCRIPTION

When using the “Force DCP” feature on a port by issuing the SET_PORT_DCP_MODE vendor request, the hub memory read/write functionality will cease to work following an overcurrent event on the port.

END USER IMPLICATIONS

The “Force DCP” feature if using the hub ROM firmware.

Work Around

Use the latest firmware version executed externally from a connected SPI Flash memory.

PLAN

This issue has been fixed in an updated firmware release. The latest firmware release may be loaded to an external SPI flash device and executed by the hub. There is no plan to update the hub ROM firmware image at this time.

Module 9: Multi-Host Endpoint Reflector cannot be used on downstream ports 5 and 6

DESCRIPTION

For USB7006 and USB7016 hubs, the Multi-Host Endpoint Reflector device cannot be enabled on downstream ports 5 and 6.

END USER IMPLICATIONS

End system integrators should ensure their systems limit Multi-Host Endpoint Reflector operation to downstream ports 1 through 4 only.

Work Around

None.

PLAN

There is no plan to address this item.

Module 10: I^2C SCL may remain low after malformed I^2C bus signaling

DESCRIPTION

The USB70xx SMBus/I^2C client interface expects the external I^2C host to provide valid I^2C bus signaling, including valid START/STOP conditions, complete byte transfers, and the required ACK/NACK clock cycle. If the hub receives a malformed or incomplete I^2C waveform from the external host, the internal I^2C controller may enter a state where the SCL line is held low by the hub. Operation may continue, but additional I^2C communication on the shared bus can be blocked while SCL remains low.

END USER IMPLICATIONS

If the system I^2C host generates invalid bus waveforms, the hub may hold SCL low, preventing further I^2C communication with the hub or other devices on the same I^2C bus. Systems that only issue valid I^2C transactions are not expected to encounter this condition.

Work Around

Ensure that the external I^2C host only generates valid I^2C-compliant transactions. Do not bit-bang or otherwise generate malformed I^2C sequences to the hub’s I^2C pins. If this condition occurs, recover the bus by resetting the I^2C host/hub or power-cycling the affected I^2C domain as required by the system design.

PLAN

There is no plan to support malformed or non-I^2C-compliant bus waveforms. This behavior will be documented as an operating limitation of the I^2C/SMBus interface.

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APPENDIX A: DOCUMENT REVISION HISTORY

Revision Level & Date	Section/Figure/Entry	Correction
DS80000811C (07-27-26)	Module 10.	Added new module.
	Microchip Information	Updated back matter.
DS80000811B (02-10-22)	All	Added USB7006, USB7016, and USB7052N to document.
	Module 9.	Added new module.
DS80000811A (11-26-18)	All	Initial release

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