

# TPS65983 Application Firmware

## 04.45.00 Release Notes



October 16, 2017

## Table of Contents

Introduction.....	5
Note: .....	5
Feature Additions and Improvements .....	5
Bug Fixes .....	5
Previous Releases .....	5
Release 0004.41.00.....	5
Note: .....	5
Feature Additions and Improvements .....	5
Bug Fixes.....	5
Release 0004.39.00.....	6
Note: .....	6
Feature Additions and Improvements .....	6
Bug Fixes.....	6
Release 0004.37.00.....	6
Note: .....	6
Feature Additions and Improvements .....	6
Bug Fixes.....	6
Release 0004.35.00.....	6
Note: .....	6
Feature Additions and Improvements .....	6
Bug Fixes.....	6
Release 0004.33.00.....	7
Note: .....	7
Feature Additions and Improvements .....	7
Bug Fixes.....	7
Release 0004.31.00.....	7
Note: .....	7
Feature Additions and Improvements .....	7
Bug Fixes.....	7
Release 0004.29.00.....	7
Note: .....	7
Feature Additions and Improvements .....	7
Bug Fixes.....	7
Release 0004.27.00.....	8
Note: .....	8
Feature Additions and Improvements .....	8
Bug Fixes.....	8
Release 0004.25.00.....	8
Note: .....	8

Feature Additions and Improvements .....	8
Bug Fixes.....	8
Release 0004.21.00 .....	8
Note: .....	8
Feature Additions and Improvements .....	8
Bug Fixes.....	8
Release 0004.19.00 .....	9
Note: .....	9
Feature Additions and Enhancements .....	9
Bug Fixes.....	9
Release 0004.17.00 .....	9
Feature Additions and Enhancements .....	9
Bug Fixes.....	9
Release 0004.13.00 .....	10
Feature Additions and Enhancements .....	10
Bug Fixes.....	10
Release 0003.65.00 .....	10
Note: .....	10
Feature Additions and Enhancements .....	10
Bug Fixes.....	11
Release 0003.63.00 .....	11
Note: .....	11
Feature Additions and Enhancements .....	11
Bug Fixes.....	11
Release 0003.61.00 .....	11
Note: .....	11
Feature Additions and Enhancements .....	11
Bug Fixes.....	11
Release 0003.59.00 .....	11
Note: .....	11
Feature Additions and Enhancements .....	11
Bug Fixes.....	12
Release 0003.45.00 .....	12
Note: .....	12
Feature Additions and Enhancements .....	12
Bug Fixes.....	12
Release 0003.33.00 .....	12
Feature Additions and Enhancements .....	12
Bug Fixes.....	12
Release 0003.31.00 .....	13

Feature Additions and Enhancements .....	13
Release 0003.29.00 .....	13
Feature Additions and Enhancements .....	13
Bug Fixes.....	13
Release 0003.27.00 .....	13
Bug Fixes.....	13
Release 0003.23.00 .....	13
Feature Additions and Enhancements .....	13
Important Notice .....	15

## Introduction

This document describes the features supported by the TPS65983 application firmware (FW) release 04.45.00. The Version register reports value of 0x00044500.

### Note:

Since FW release 3.59, USB Billboard spec version 1.21 has been implemented in the firmware. This version of Billboard spec is NOT identified by Windows 10. This could result into Windows10 not identifying the Billboard class correctly.

## Feature Additions and Improvements

### Bug Fixes

- Allow DP Alt Mode entry with Active cables that support DP SID

## Previous Releases

### Release 0004.43.00

#### Note:

Since FW release 3.59, USB Billboard spec version 1.21 has been implemented in the firmware. This version of Billboard spec is NOT identified by Windows 10. This could result into Windows10 not identifying the Billboard class correctly.

#### Feature Additions and Improvements

#### Bug Fixes

- Fixed an issue where in a system with multiple ports, I2C2 was not working in previous release.

### Release 0004.41.00

#### Note:

Since FW release 3.59, USB Billboard spec version 1.21 has been implemented in the firmware. This version of Billboard spec is NOT identified by Windows 10. This could result into Windows10 not identifying the Billboard class correctly.

#### Feature Additions and Improvements

#### Bug Fixes

- Fixed bug where PP\_EXT switch iLIM was being set incorrectly. Note that this bug is applicable only when PPEXT is configured as an output.
- Fixed an incorrect check for APDOs in auto negotiation. The check was added to exclude APDOs when selecting a PDO as a sink but was incorrectly rejecting variable PDOs.

## Release 0004.39.00

### Note:

Since FW release 3.59, USB Billboard spec version 1.21 has been implemented in the firmware. This version of Billboard spec is NOT identified by Windows 10. This could result into Windows10 not identifying the Billboard class correctly.

### Feature Additions and Improvements

#### Bug Fixes

- VCONNminimum for cables needs to change from 4.75V-5.5V to 3.0-5.5V.
- Spec compliance issue w.r.t. resetting MessageIDs after successful PR\_Swap.
- Source Policy Master - When waking up from deep sleep the I2C master config is lost. This was only an issue when sleep was used along with SPM.

## Release 0004.37.00

### Note:

Since FW release 3.59, USB Billboard spec version 1.21 has been implemented in the firmware. This version of Billboard spec is NOT identified by Windows 10. This could result into Windows10 not identifying the Billboard class correctly.

### Feature Additions and Improvements

#### Bug Fixes

- Should not select PPS (A)PDOs when it shouldn't.

## Release 0004.35.00

### Note:

Since FW release 3.59, USB Billboard spec version 1.21 has been implemented in the firmware. This version of Billboard spec is NOT identified by Windows 10. This could result into Windows10 not identifying the Billboard class correctly.

### Feature Additions and Improvements

#### Bug Fixes

- Fixed bug in DataStatus.USBDataRole implementation where no interrupt was being generated upon an unplug.
- Avoid delay between configuring the current limit and enabling the switch.

## Release 0004.33.00

### Note:

Since FW release 3.59, USB Billboard spec version 1.21 has been implemented in the firmware. This version of Billboard spec is NOT identified by Windows 10. This could result into Windows10 not identifying the Billboard class correctly.

### Feature Additions and Improvements

#### Bug Fixes

- Addition of `DataStatus.USBDataRole`.

## Release 0004.31.00

### Note:

Since FW release 3.59, USB Billboard spec version 1.21 has been implemented in the firmware. This version of Billboard spec is NOT identified by Windows 10. This could result into Windows10 not identifying the Billboard class correctly.

### Feature Additions and Improvements

#### Bug Fixes

- Fixed an issue with Application Customization when using selected records offset field
- Source Policy Master. Limit power allocated to Sink to `VBUSMaxPower` specified in `SRCPolicyMaster Auto Negotiate Source` register (0x38)
- Removed code in the charger detection block that disabled the SBU mux during charger detection. We don't need to disable it during that process. This was corrupting the mux registers which were previously configured for DP or TBT.

## Release 0004.29.00

### Note:

Since FW release 3.59, USB Billboard spec version 1.21 has been implemented in the firmware. This version of Billboard spec is NOT identified by Windows 10. This could result into Windows10 not identifying the Billboard class correctly.

### Feature Additions and Improvements

#### Bug Fixes

- `DataStatus.CapMismatch` applies only to TBT connections
- Use `ActiveContractInfo.MinimumRequirementsMet` in switch code and TBT code to validate power contract.

## Release 0004.27.00

### Note:

Since FW release 3.59, USB Billboard spec version 1.21 has been implemented in the firmware. This version of Billboard spec is NOT identified by Windows 10. This could result into Windows10 not identifying the Billboard class correctly.

### Feature Additions and Improvements

- Added a feature where old Source will enable VCONN temporarily just before PR\_Swap in order to allow the new Source to communicate with cable plug after PR\_Swap. The new Source does not know when VCONN was enabled by old Source. It is possible that VCONN got enabled just before PR\_Swap completed. So the new Source will wait tvconnStable time starting any PD Communication as a Source

### Bug Fixes

- Fixed an issue with bus powered devices where device would enter TBT mode when minimum power was not met.
- Added a fix such that only a DFP can talk to the plug after PD contract as per PD2.0 spec
- Fixed problem where protection diode on CC advertisement was not bypassed on 3.0A advertisement causing TPS65983 to not detect disconnect

## Release 0004.25.00

### Note:

Since FW release 3.59, USB Billboard spec version 1.21 has been implemented in the firmware. This version of Billboard spec is NOT identified by Windows 10. This could result into Windows10 not identifying the Billboard class correctly.

### Feature Additions and Improvements

### Bug Fixes

- Removed addition of DataStatus.USBDataRole (bit 7)

## Release 0004.21.00

### Note:

Since FW release 3.59, USB Billboard spec version 1.21 has been implemented in the firmware. This version of Billboard spec is NOT identified by Windows 10. This could result into Windows10 not identifying the Billboard class correctly.

### Feature Additions and Improvements

- Unifying BPD, SPD, SPM branches wrt input switch handling

### Bug Fixes

- Task Handling Bug Fix: If task could not be handled while squelch was active, then squelch idle should check for handling the task once it becomes idle.
- Fix for USB\_EP code where USB EP can hang during plug/unplug tests



- StopTimer hardfault condition workaround
- After issuing cable reset to plug controllers, the DFP should re-enter modes on plug
- Clear Status register's AlternateModeActive field during a PD HardReset sequence after exiting all alternate modes
- Fixes for AA Get OTP and AA Get Flash Master Flag commands
- All-Ace commands requiring data send ACK without data
- TPS65983 fails to open PP\_EXT FET on disconnect (UVP as Sink)

## **Release 0004.19.00**

### **Note:**

Since FW release 3.59, USB Billboard spec version 1.21 has been implemented in the firmware. This version of Billboard spec is NOT identified by Windows 10. This could result into Windows10 not identifying the Billboard class correctly.

### **Feature Additions and Enhancements**

- Add support for handling ReclaimAvailablePower field in the SRCPolicyMaster Auto Negotiate Source (0x38) register.
  - If ReclaimAvailablePower field is clear then power allocated to a port is not reclaimed until that port goes through cable disconnect or PR\_Swap to become a Sink.
  - If ReclaimAvailablePower field is set and power allocated by a port is more than what the Sink needs, then the extra will be reclaimed from that port.

### **Bug Fixes**

- Assign fixed values to notification events so that there is no change in event values based on build configuration. Absence of this fix caused plug insert/removal gpio event on '83 code to not happen in certain builds

## **Release 0004.17.00**

### **Feature Additions and Enhancements**

- Source Policy Master feature with recent changes
  - Updated definition of registers: SRCPolicyMaster Auto Negotiate Source (0x38) and SRCPolicyMaster Available Current (0x39) to include a single power reserve for VBUS and single current reserve for VCONN
  - Remove hard-coded setting for SourcePolicyMode and PolicyMasterIRQ GPIO from firmware as this is done by the configuration tool now
  - If a Sink with a contract that has capability mismatch keeps sending subsequent Requests with capability mismatch AND same power, then stop endless cycle of power allocation as the required power has already been allocated

### **Bug Fixes**

- When computing max power required by Sink, look at the power in the SinkCap PDOs. If a Battery Supply PDOs with Max power is found then use its power even if there are other fixed/variable supply SinkCap PDOs of higher power

- Allow power supply at least tSrcSettle (275ms) before deciding that the PDO cannot be sourced and sending PD HardReset message
- Delay sending PS ready as Source while accounting for switch turn-on time. This allows sending PS\_RDY after transition is complete and also make sure VBUS does not drop during high to low voltage transition
- A source should consider saved cable discovery response after PD HardReset in order to decide allowed cable current limit
- Change the vSafe5v maximum level from 5.25V to 5.5V as per USB-TypeC ECN

## Release 0004.13.00

### Feature Additions and Enhancements

- Source Policy Master feature
  - Supports two ports. One port is the source policy master, the other is a slave. This is handled in app customization.
  - Currently the SPI flash master becomes the Source Policy Master and the port not connected to SPI flash is the slave.
  - Currently Source Policy Master needs GPIO 8 to be connected to I2C2\_IRQ of slave. This not configurable in this build.
- App customization
  - The SPI master should read app config data from flash only when booting from cold reset i.e., AppFW should not access flash when rebooting due to:
    - 1st watchdog reset - This is an M0 reset where it reboots from AppFW, so SRAM should have AppCust data intact in the RAM
    - 2nd Watchdog reset - In this case SPI master reboots from boot code and it should have done a distressed boot to get the image as well as AppCust data from secondary slave.
  - Use BootStatus.AceNumber for I2C\_ADDR

### Bug Fixes

- Fixed an issue where ANRDOPriority field in ANeg register was not working correctly
- Fixed struct tHostInterfaceIntEvents, Byte8 is missing Bit5.
- Charger detection allowed to complete even after a PD contract is in place.
- After any kind of reset, the SPI master should initiate discovery of uart boot slaves after a timeout if the secondary slaves did not already start uart boot sequence.

## Release 0003.65.00

### Note:

Since FW release 3.59, USB Billboard spec version 1.21 has been implemented in the firmware. This version of Billboard spec is NOT identified by Windows 10. This could result into Windows10 not identifying the Billboard class correctly.

### Feature Additions and Enhancements

- Support for GAID command.

**Bug Fixes**

- Set Type-C current to Negotiated when we receive Accept as a Sink because Source can change its Rp right after sending PS\_RDY.
- Check if VIN3V3 is good before clearing dead battery flag. This is just a safety net.

**Release 0003.63.00****Note:**

Since FW release 3.59, USB Billboard spec version 1.21 has been implemented in the firmware. This version of Billboard spec is NOT identified by Windows 10. This could result into Windows10 not identifying the Billboard class correctly.

**Feature Additions and Enhancements****Bug Fixes**

- Addressed an issue where the bmConfigured field of the BOS descriptor would always return 0b01 (Alternate mode configuration not attempted) for every alternate mode, even if the mode had been attempted and failed or was successful.

**Release 0003.61.00****Note:**

Since FW release 3.59, USB Billboard spec version 1.21 has been implemented in the firmware. This version of Billboard spec is NOT identified by Windows 10. This could result into Windows10 not identifying the Billboard class correctly.

**Feature Additions and Enhancements****Bug Fixes**

- Billboard - bAlternateMode in Billboard Capability Descriptor and bIndex in Billboard Alternate Mode Descriptor should start at zero not 1.

**Release 0003.59.00****Note:**

Since FW release 3.59, USB Billboard spec version 1.21 has been implemented in the firmware. This version of Billboard spec is NOT identified by Windows 10. This could result into Windows10 not identifying the Billboard class correctly.

**Feature Additions and Enhancements**

- Billboard
  - Updated to spec v1.21.
  - Added support for new Billboard Alternate Mode Capability Descriptor.
- Billboard and TBT
  - TPS65983 will Billboard if power contract upon initial entry into TBT mode has insufficient power. When required power becomes available in a future contract, Billboard will be removed and not come back again because of insufficient power.

- Workaround for Google 60W charger which Rejects Requests where Max operating current is greater than allowed operating current.

**Bug Fixes**

- DataMux for USB2 is set to HI-Z and changed to USB\_EP only when TPS65983 decides to Billboard.

Uart: Re-enable the UART\_RX\_OVERFLOW flag.

**Release 0003.45.00****Note:**

Since FW release 3.33, USB Billboard spec version 1.2 has been implemented in the firmware. This version of Billboard spec is NOT identified by Windows 10. This could result into Windows10 not identifying the Billboard class correctly.

**Feature Additions and Enhancements**

- Changed VCONN current limit setting to the higher overcurrent limit.
- Enhancement for thermal shutdown auto-disable feature.
- Re-enable e-mark requirement for entering the Thunderbolt Alt Mode.

**Bug Fixes**

- Fixed issue where TPS65983 detects 5Gbps USB device as 10Gbps.
- Fix spec compliance issue - transition from DRP AttachWait.SRC should be to Unattached.SNK if device disconnect is detected.
- Update TPS65983 VCONN provider role to monitor PP\_CABLE and re-enter modes with cable when PP\_CABLE is lost and then recovers.
- Fix for "bAlternateMode" to be of length 4 bytes (in Billboard spec 1.2) instead of 2 (before Billboard spec 1.2)

**Release 0003.33.00****Feature Additions and Enhancements**

- Billboard implementation updated for Thunderbolt devices

**Bug Fixes**

- Fix handling of thermal shutdown events where "switch auto-disable" bit remained turned off for second TSD event which could cause switch damage.
- Fix an issue where port thinks there a connection on an "empty" port after sleep/wake with Thunderbolt device attached
- Fixed an issue where DFP could get locked up in continuous mode discovery on cable plug if the cable fails to respond (i.e., GoodCRC, but no ACK/NAK/BUSY) to Discover Mode command
- Fix an issue with billboard string returning 0 bytes

## Release 0003.31.00

### Feature Additions and Enhancements

- Added secure flash command (SFWs)

## Release 0003.29.00

### Feature Additions and Enhancements

- Added GPIO event for Plug connect/disconnect.

### Bug Fixes

- JIRA #1343 - Overcurrent bit in status register was consistently set even after the removal of the overcurrent condition.
- JIRA #1580 - GPIO events for PDO: Fixed missing increment in ClearGpioPdoNegotiated() which was causing the GPIO for a PDO is not get cleared on a disconnect.
- JIRA #1457 - Fix compliance failure where TPS65983 was not initiating Soft Reset on receiving an un-expected message if it has a PD contract.
- USB\_EP and Billboard:
  - USB class added to Device descriptor to specify Billboard Device instead of to interface descriptor
  - Changes to pass USBCV
  - Check specifically for Microsoft OS Descriptor Index (0xEE) and STALL as it is not supported

## Release 0003.27.00

### Bug Fixes

- JIRA #1343 - Overcurrent bit in status register was consistently set even after the removal of the overcurrent condition.
- JIRA #1580 - GPIO events for PDO: Fixed missing increment in ClearGpioPdoNegotiated() which was causing the GPIO for a PDO is not get cleared on a disconnect.
- JIRA #1457 - Fix compliance failure where TPS65983 was not initiating Soft Reset on receiving an un-expected message if it has a PD contract.
- USB\_EP and Billboard:
  - USB class added to Device descriptor to specify Billboard Device instead of to interface descriptor
  - Changes to pass USBCV
  - Check specifically for Microsoft OS Descriptor Index (0xEE) and STALL as it is not supported

## Release 0003.23.00

### Feature Additions and Enhancements

- Added unsecured flash commands (SFWi and SFWd and SFWu) from the last release 03.21.xx.



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