

System level Integration of PSF

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Table of Contents

[1 Introduction 5](#_Toc24720157)

[1.1 Terms and abbreviations 5](#_Toc24720158)

[1.2 References 5](#_Toc24720159)

[2 Software licence Agreement 5](#_Toc24720160)

[3 Hardware Integration 5](#_Toc24720161)

[3.1 UPD 350 5](#_Toc24720162)

[3.1.1 Hardware Communication Interface 5](#_Toc24720163)

[3.1.2 PIOs for UPD350 Alert 6](#_Toc24720164)

[3.1.3 PIO for UPD350 Reset 6](#_Toc24720165)

[3.2 Hardware Timer 6](#_Toc24720166)

[3.3 DC-DC Buck boost controller 6](#_Toc24720167)

[4 Software integration 7](#_Toc24720168)

[4.1 Memory Requirement 7](#_Toc24720169)

[4.1.1 32-bit MCU 7](#_Toc24720170)

[4.1.2 16-bit MCU 7](#_Toc24720171)

[4.1.3 8-bit MCU 8](#_Toc24720172)

[4.2 Multi-Port Support Requirement 8](#_Toc24720173)

[4.3 Endianness 8](#_Toc24720174)

[4.4 API Implementation required for SW integration 8](#_Toc24720175)

[4.4.1 Block Diagram – TBD 8](#_Toc24720176)

[4.4.2 Data Types 8](#_Toc24720177)

[4.4.3 APIs to be implemented by the user application 8](#_Toc24720178)

[4.4.3.1 UPD350 Hardware Interface Configurations 8](#_Toc24720179)

[4.4.3.2 PD Timer Configuration 8](#_Toc24720180)

[4.4.3.3 UPD350 Alert Control 8](#_Toc24720181)

[4.4.3.4 UPD350 Reset Control 8](#_Toc24720182)

[4.4.3.5 SOC Interrupt Enable/Disable 8](#_Toc24720183)

[4.4.3.6 Memory Compare and Copy 8](#_Toc24720184)

[4.4.3.7 Structure Packing 8](#_Toc24720185)

[4.4.3.8 Port Power Control 9](#_Toc24720186)

[4.4.3.9 Boot time configuration 9](#_Toc24720187)

[4.4.3.10 Hooks for Policy Manager 9](#_Toc24720188)

[4.4.3.11 Debug Hooks 9](#_Toc24720189)

[4.4.3.12 PD Firmware Upgrade 9](#_Toc24720190)

[4.4.4 APIs to be called by the user application 9](#_Toc24720191)

[4.4.5 Notification callback from PSF 9](#_Toc24720192)

# Introduction

## Terms and abbreviations

## References

# Software licence Agreement

# Hardware Integration

## UPD 350

UPD350 silicon is required for each port specifically. Zeus Stack supports UPD350 Rev A Silicon part with SPI Companion support i.e. UPD350/B, UPD350/D & UPD350/F parts of UPD350 Rev A.

### Hardware Communication Interface

**SPI Master:**

SPI master is required as Zeus stack interacts with UPD350 only through SPI interface. UPD350 SPI Slave supports maximum of 25MHz.

MCU SPI Master

CS 2

CS n

CS 1

SPI Bus

Port n UPD350

Port 2 UPD350

Port 1 UPD350

…..

*Note: ‘n’ denotes maximum number of ports.*

*cs denotes Chip select or slave select.*

2 Port Source and Sink solution is tested SPI Master with 8MHz.

### PIOs for UPD350 Alert

Alert line of each UPD350 must be mapped to individual GPIOs of MCU in the HW platform.

MCU GPIO Control

GPIO n

GPIO 2

GPIO 1

Port 1 UPD350 IRQ

Port n UPD350 IRQ

…..

Port 2 UPD350 IRQ

*Note: ‘n’ denotes maximum number of ports.*

### PIO for UPD350 Reset

## Hardware Timer

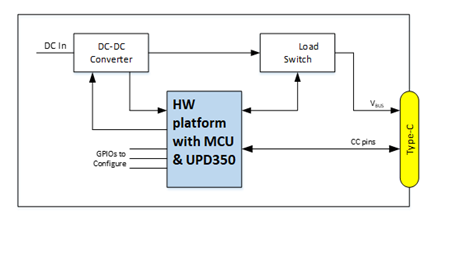
A Hardware timer with minimum resolution of 1ms is required for Zeus stack functionality.

The recommended resolution is 1ms.

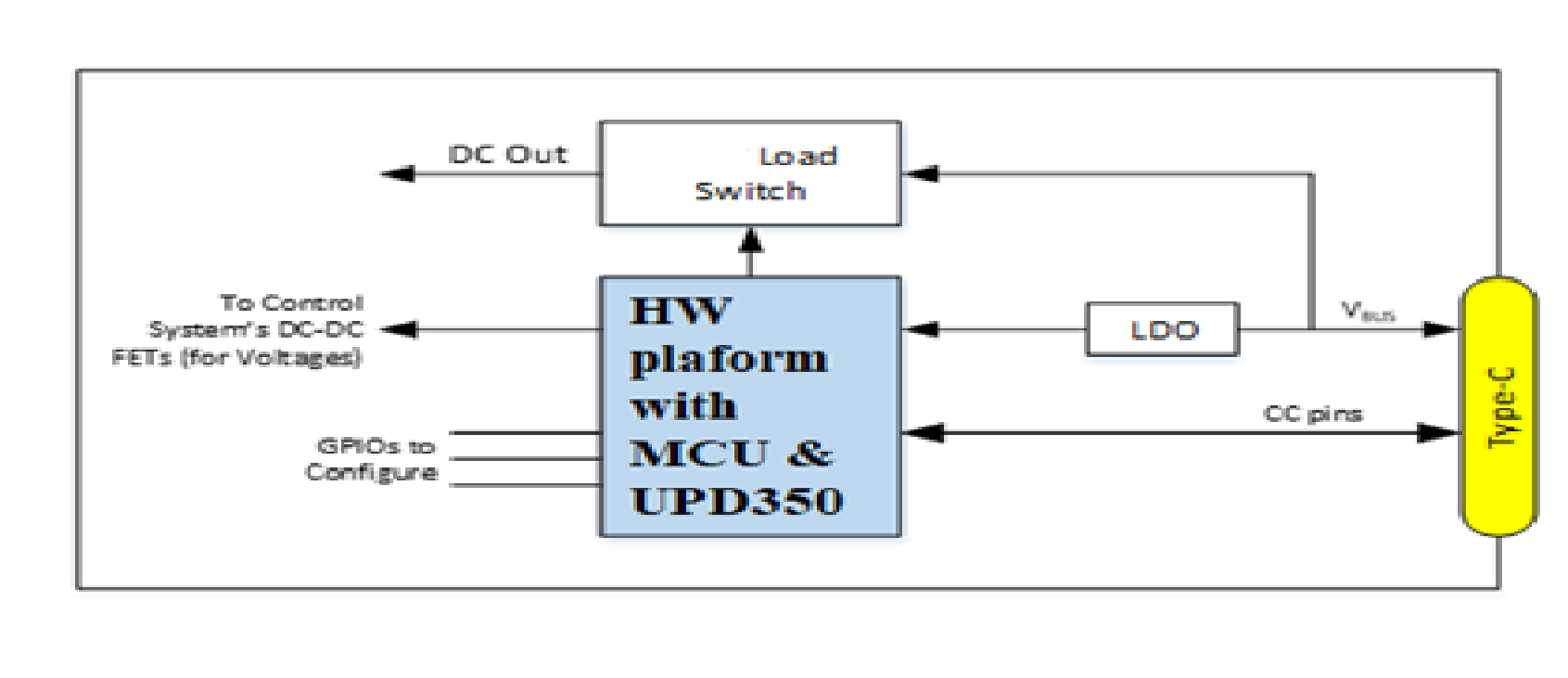
## DC-DC Buck boost controller

UPD350 cannot drive higher PD voltages directly. A DC-DC converter is required to drive higher PD voltages.

For Source-only port, the setup would be as follows,



For Sink-Only port, the set up would be as follows,



# Software integration

## Memory Requirement

### 32-bit MCU

* Estimated Code size of PSF Stack is 23KB for listed features in section [Supported features](#_Supported_features).
* Estimated Data RAM size is 1KB (RAM for Stack operation) + 1KB per port.

*Note: Above mentioned memory estimate is only approximate.*

### 16-bit MCU

TBD

### 8-bit MCU

TBD

## Multi-Port Support Requirement

PSF supports maximum of 4 Port.

## Endianness

PSF stack supports only Little-Endian format.

## API Implementation required for SW integration

### Block Diagram – TBD

### Data Types

Explanation what is UINT8, UINT16,

### APIs to be implemented by the user application

List of APIs with Hyperlink in a table format

#### UPD350 Hardware Interface Configurations

Hooks required for SPI or I2C Initialization, Read and Write

#### PD Timer Configuration

Hooks and Macros required for HW Timer Initialization and Configuration

#### UPD350 Alert Control

Hooks to initialize the SOC PIOs used for UPD350 Alert control

#### UPD350 Reset Control

Hooks to Initialize the SOC PIO that Controls UPD350 Reset and to drive UPD350 Reset

#### SOC Interrupt Enable/Disable

Hooks to enable/Disable Global interrupts in SOC

#### Memory Compare and Copy

Hooks to copy and compare operations

#### Structure Packing

Macros for structure packing

#### Port Power Control

Hooks to overcome default GPIO Port power control (PortPower Init, VBUS Drive, VBUS Discharge, Sink Circuitry Control)

#### Boot time configuration

Hooks to modify configurable parameters at boot time

#### Hooks for Policy Manager

Hooks to run before and after Policy Manager Execution

#### Debug Hooks

Driver for printing debug messages

#### PD Firmware Upgrade

Hooks required for PDFU functionality

### APIs to be called by the user application

Hooks to be called by the SOC layer

* + MCHPPSF\_Init()
  + MCHPPSF\_Run()
  + MCHPPSF\_UPDAlertHandler()
  + MCHPPSF\_PDTimerHandler()

Note: The frequency at which the APIs to be called shall be captured

### Notification callback from PSF

Callback API that provide per port event like Detach, Attach, Powerfaults, UPD350Idle.