

Getting started with PSF

Information contained in this publication regarding device applications and the like is provided only for your convenience and can be superseded by updates. It is your responsibility to ensure that your application meets with your specifications. MICROCHIP MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND WHETHER EXPRESS OR IMPLIED, WRITTEN OR ORAL, STATUTORY OR OTHERWISE, RELATED TO THE INFORMATION, INCLUDING BUT NOT LIMITED TO ITS CONDITION, QUALITY, PERFORMANCE, MERCHANTABILITY OR FITNESS FOR PURPOSE**.**

Microchip disclaims all liability arising from this information and its use. Use of Microchip devices in life support and/or safety applications is entirely at the buyer’s risk, and the buyer agrees to defend, indemnify and hold harmless Microchip from any and all damages, claims, suits, or expenses resulting from such use. No licenses are conveyed, implicitly or otherwise, under any Microchip intellectual property rights.

|  |  |  |  |
| --- | --- | --- | --- |
| Microchip Technology, Inc. | | | Microchip Technology, Incorporated  2355 W. Chandler Boulevard  Chandler, Arizona 85224  480/792-7416 |
| REV | DATE | ORIGINATOR | DESCRIPTION OF CHANGE |
| 0.1 | 25-Nov |  | Initial revision |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

Table of Contents

[1 Introduction 5](#_Toc25566246)

[1.1 Features Overview 5](#_Toc25566247)

[1.2 Terms and abbreviations 5](#_Toc25566248)

[1.3 References 7](#_Toc25566249)

[2 Software License Agreement: 7](#_Toc25566250)

[3 PSF FW Architecture Overview 7](#_Toc25566251)

[3.1 Device Policy Manager (DPM) 7](#_Toc25566252)

[3.2 Policy Engine 7](#_Toc25566253)

[3.3 Protocol Layer 7](#_Toc25566254)

[3.4 Type-C Connector Management 7](#_Toc25566255)

[3.5 Interrupts/Timer Management 7](#_Toc25566256)

[3.6 Port Power Management 7](#_Toc25566257)

[3.7 Power Delivery Firmware Update (PDFU) 7](#_Toc25566258)

[4 Supported/Not Supported PD Features and Messages 8](#_Toc25566259)

[4.1 Supported/Not Supported PD features 8](#_Toc25566260)

[4.1.1 Supported features 8](#_Toc25566261)

[4.1.2 Not supported features 8](#_Toc25566262)

[4.2 Supported/Not Supported PD messages 8](#_Toc25566263)

[4.2.1 Supported PD Messages 8](#_Toc25566264)

[4.2.2 Unsupported PD Messages 8](#_Toc25566265)

[5 PSF Configurability Options 8](#_Toc25566266)

[6 PSF System level integration 8](#_Toc25566267)

[7 Directory structure 8](#_Toc25566268)

[7.1 PSF Source 8](#_Toc25566269)

[7.2 SOC Portable 8](#_Toc25566270)

[7.3 Demo Applications 8](#_Toc25566271)

[8 Frequently Asked Questions (FAQ) 8](#_Toc25566272)

# Introduction

USB Power Delivery Software Framework (PSF) with USB-PD Port Controller UPD350 is an effective USB-PD solution compliant to USB-PD 3.0 Specification.

PSF stack is designed to run on different MCU Hardware platform. Versatility towards different HW platform is achieved through flexibility towards configurability of PSF stack.

This section describes PSF stack configurability features & directory structure.

This document is a user guide to PSF and it covers the following topics,

* PSF overview and its architecture
* Memory & Hardware level requirements
* PSF stack directory structure
* Supported/Not supported features
* Requirements for expanding the PD-solution for multi-ports
* Supported/Not supported PD messages
* Reference links to related PSF documents

## Features Overview

Following are the key features of PSF stack,

* Compliant to USB Power Delivery 3.0 & Type-C specification V1.3
* Multiport support
* USB-PD Source-only or Sink-only port specific configurability
* FW update through CC support compliant to USB PD Firmware Update Specification R1.0.

## Terms and abbreviations

The following are the list of terms and abbreviations used in this document.

|  |  |
| --- | --- |
| **Term** | **Meaning** |
| PSF | USB Power Delivery Software Framework |
| DPM | Device Policy Manager |
| FW | Firmware |
| PE | Policy Engine |
| USB-PD | USB Power Delivery |
| UPD 350 | Microchip USB Power Delivery port controller |
| UPD 301 | Microchip Stand-Alone Type-C/PD Port Controller |
| CC | Configuration Channel |
| IRQ | Interrupt Request Line |
| MCU | Microcontroller |
| USBPD3 | USB Power Delivery Specification 3.0 |
| Dynamic power balancing | For Sources with multiple port, monitoring and balancing power requirements across these ports. |

## References

Following are the list of documents for reference,

* Microchip UPD350 Datasheet
* USB Power Delivery 3.0 Specification Revision 1.1 + ECNs
* USB Type-C Specification Revision 1.3

# Software License Agreement:

Copyright © [2019] Microchip Technology Inc. and its subsidiaries.

Subject to your compliance with these terms, you may use Microchip software and any derivatives exclusively with Microchip products. It is your responsibility to comply with third party license terms applicable to your use of third-party software (including open source software) that may accompany Microchip software.

THIS SOFTWARE IS SUPPLIED BY MICROCHIP "AS IS".  NO WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, APPLY TO THIS SOFTWARE, INCLUDING ANY IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY, AND FITNESS FOR A PARTICULAR PURPOSE.

IN NO EVENT WILL MICROCHIP BE LIABLE FOR ANY INDIRECT, SPECIAL, PUNITIVE, INCIDENTAL OR CONSEQUENTIAL LOSS, DAMAGE, COST OR EXPENSE OF ANY KIND WHATSOEVER RELATED TO THE SOFTWARE, HOWEVER CAUSED, EVEN IF MICROCHIP HAS BEEN ADVISED OF THE POSSIBILITY OR THE DAMAGES ARE FORESEEABLE.  TO THE FULLEST EXTENT ALLOWED BY LAW, MICROCHIP'S TOTAL LIABILITY ON ALL CLAIMS IN ANY WAY RELATED TO THIS SOFTWARE WILL NOT EXCEED THE AMOUNT OF FEES, IF ANY, THAT YOU HAVE PAID DIRECTLY TO MICROCHIP FOR THIS SOFTWARE.

# PSF FW Architecture Overview

## Device Policy Manager (DPM)

## Policy Engine

## Protocol Layer

## Type-C Connector Management

## Interrupts/Timer Management

## Port Power Management

## Power Delivery Firmware Update (PDFU)

# Supported/Not Supported PD Features and Messages

## Supported/Not Supported PD features

### Supported features

### Not supported features

## Supported/Not Supported PD messages

### Supported PD Messages

### Unsupported PD Messages

# PSF Configurability Options

# PSF System level integration

# Directory structure

## PSF Source

TBD

## SOC Portable

TBD

## Demo Applications

TBD

# Frequently Asked Questions (FAQ)