

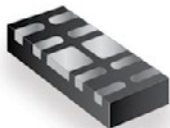
Solution Products



MF-LSMF300/24X



CDDFN10-0524P



CDDFN10-3324P



SRP6540-100M

Design Kit



PN-DESIGNKIT-57

Objective

The USB Power Delivery Specification enables the maximum functionality of USB by providing more flexible power delivery along with data over a single cable. Increased and low power levels (10-100 W) are delivered with maximum efficiency. The power source must be able to provide short circuit current limiting to protect its port from excessive current while at the same time maintaining the maximum power needed by the peripheral without accidentally tripping. This solution provides this protection.

Benefit

In addition to providing port protection from excessive current as mandated by power delivery, this is a cost-effective solution when compared to a separate overcurrent protection IC.

Solution

- 1 Multifuse® PPTC Resetttable Fuse:
MF-LSMF300/24X
(Profile 3: 12 V, 3 A; Profile 4: 20 V, 3 A)
- 1 4-Channel 5.0 V TVS Diode Array:
CDDFN10-0524P
- 3 4-Channel 3.3 V TVS Diode Arrays:
CDDFN10-3324P
- 1 High-Current Power Inductor:
SRP6540-100M

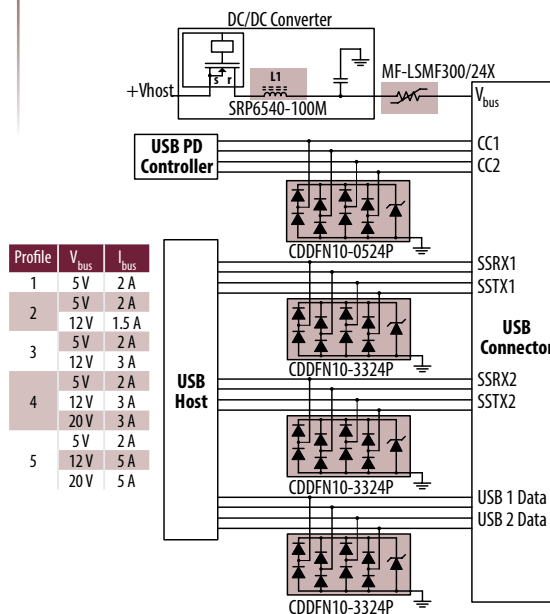
Compliance*

UL60950, USB PD 1.0, USB 3.1

Alternate Recommendations

MF-MSMF150/16X or

MF-SMDF150 (Profile 2: 12 V, 1.5 A)



*The schematic illustrates a possible combination of the solution products to achieve the stated protection goal and does not constitute the complete circuit design. Customers should verify actual device performance in their specific circuits and applications.

1. The Multifuse® products (MF-LSMF300X/24X, MF-MSMF150/16X, MF-SMDF150) help ensure an application's compliance to
 - A. USB 3.1 (section 11.4.1.1.1) in that a polymer PTC may be used for overcurrent protection of the DC bus; and
 - B. UL60950-1 Section 2.5 (Limited Power Source Table 2B) in that any short circuit current shall be limited to less than 8 A within 5 seconds.
2. The inductor model SRP6540-100M is part of the DC DC converter which provides the power levels (profiles) as described in the USB PD 1.0 Standard.
3. The TVS diode arrays (CDDFN10-0524P and CDDFN10-3324P) provide ESD and Surge Protection to the Cable Connect Lines (CC1, CC2) and Data Lines of the USB Port. Customers should evaluate the effects of the capacitance of the TVS diode arrays on the quality of USB 3.1 data flow in their specific circuits and applications.
4. Profiles 1 and 5 as described are shown for informational purposes only. This PortNote® Solution is applicable to profiles 2, 3 and 4.