ORTNOTE SOLUTIONS

USB

Power Delivery Protection

Solution Products



ME-I SME300/24X



CDDFN2-T5 0I C



CDDFN10-3324F



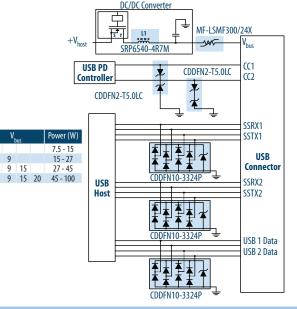
SRP6540-100M

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 Resettable Fuse: MF-LSMF300/24X (Profile 2: 9 V, 3 A, Profile 3: 15 V, 3 A) 2 5.0 V TVS Diodes: CDDFN2-T5.0LC 3 4-Channel 3.3 V TVS Diode Arrays: CDDFN10-3324P 1 High-Current Power Inductor: SRP6540-4R7M

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Compliance*

UL60950, USB PD 2.0, 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 SRP6540-4R7M is part of the DC/DC converter which provides the power levels (profiles) as described in the USB PD 3.0 Standard.
- 3. The TVS diode array CDDFN10-3324P and TVS diode CDDFN2T5.0LC 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. Profile 4 as described is shown for informational purposes only. This PortNote® Solution is applicable to profiles 2 and 3.

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