

# AN1148

## DPO2039 Application Note

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### Introduction

The USB Type-C has become the standard for charging and data transferring in the electronic market due to its fast speed, high power delivery, compact and reversible connections. Because of high power and compact size, the USB-C is in risk to over-voltage / current surge caused by the unexpected short to  $V_{BUS}$  event. The voltage and current spikes can permanent damage the device and lead to subsequent system failure. Therefore, protection must be incorporated into the USB Type-C system. The DPO2039 is such a device which is designed to work with the USB-C system and protect it from any unexpected catastrophic failures.

### Basic Circuit Configuration for DPO2039

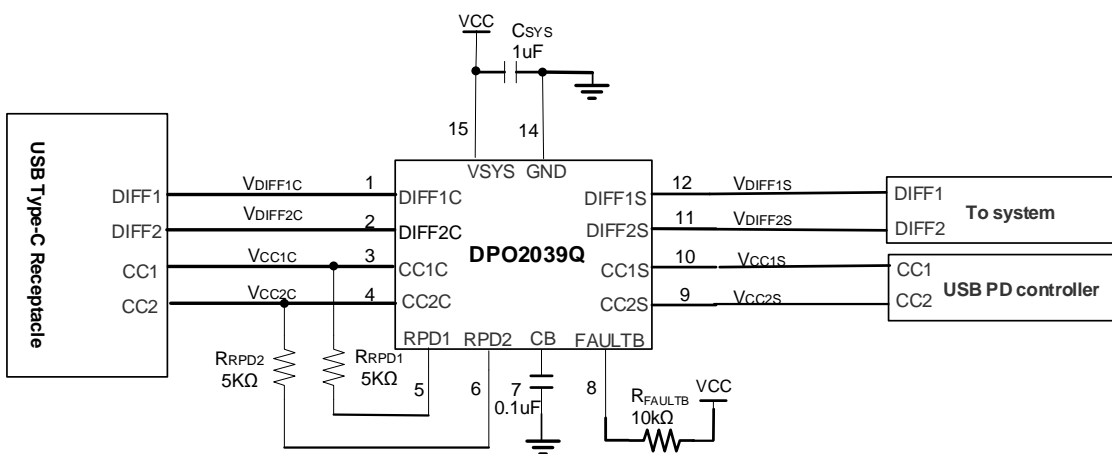
1. VSYS is the power input pin. It requires a 1uF MLCC capacitor from this pin to GND pin to provide smooth and reliable voltage source to power the DPO2039
2. For ESD protection, connect a 0.1uF MLCC capacitor from this pin to ground.
3. Dead-battery charging option
  - A. To enable dead-battery mode support, place a 5KΩ resistor from RPD1 to CC1 and RPD2 to CC2 pins respectively. The resistor should be 5% or better tolerance.
  - B. If dead-battery mode support is not used, leave the RPD1 and RPD2 pins open.

Please refer to Figure 1 and Figure 2 below for dead-batter charging configurations.

DPO2039 Circuit Configuration with and without dead-battery charging

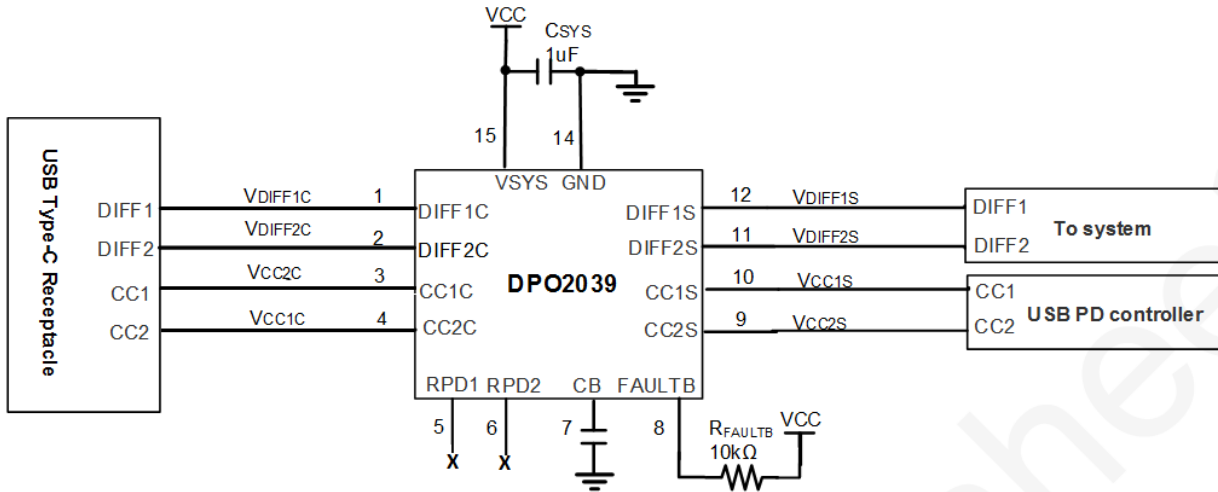
### DPO2039 Circuit Configuration With and Without Dead-Battery Charging

- A. Dead-battery charging enable



**Figure 1. Connect a 5KΩ Resistor from RPD1 to CC1C and RPD2 to CC2C to Enable Dead-Battery Charging Option**

**B. Dead-battery charging disable**



**Figure 2. Leave RPD1 and RPD2 Open When Dead-Battery Option is not Used**

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