SMFA Series Asymmetric TVS Diodes for SiC MOSFET Gate Protection

Overview

The SMFA Series are asymmetrical TVS diodes designed specifically to protect SiC MOSFETs gates from overvoltage events.

Compared to silicon devices, SiC MOSFETs have low er negative gate voltage withstand capability. Consequently, an asymmetrical protection using two separate TVS diodes as shown in Figure 1 is common. Littelfuse now offers the SMFA asymmetrical, bidirectional TVS diodes in one single component. This solution helps to effectively reduce parasitic effects and PCB area especially in fast switching SiC applications.

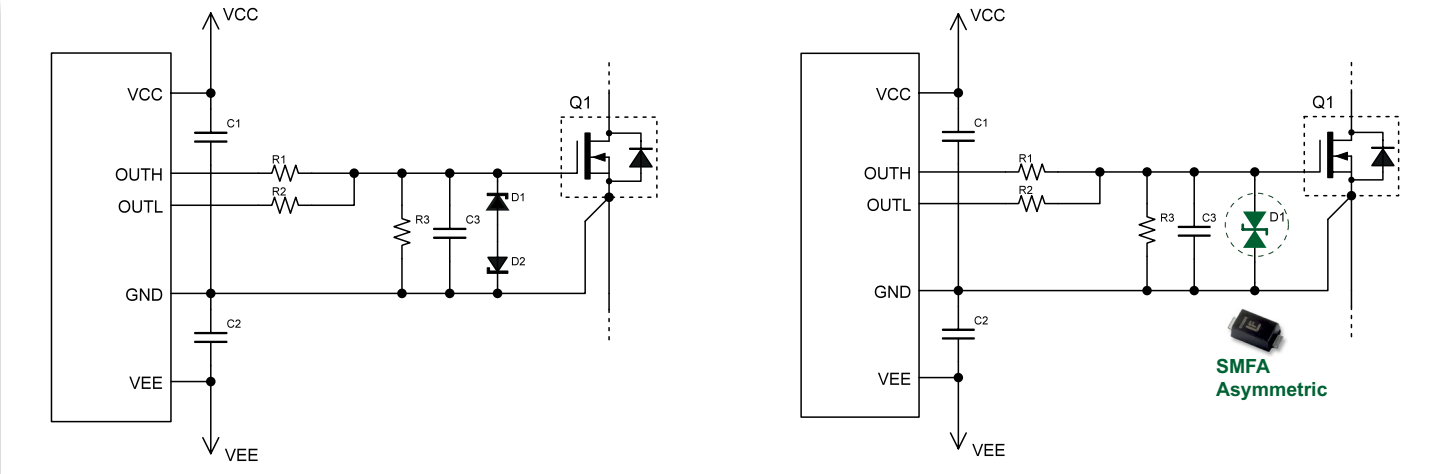
Features

- Single component SiC MOSFET gate protection with asymmetrical gate voltage protection
- Low clamping voltage for negative gate drive, V_C < 8 V @ 2 A (10/1000 µs)
- Variety of positive standoff voltages, V_{BR} 15 ~ 20 V compatible with popular SiC MOSFETS
- Stable capacitance over wide range of operating frequency (2 MHz) compatible with SiC MOSFET applications
- Compact, 1mm low profile, SOD123-FL package

Benefits

- Reduced part-count
- Reduced PCB-space
- Lower complexity, paired with higher reliability
- Precisely defined voltage levels

Figure 1. Standard gate protection with two separate TVS diodes vs. one Asymmetric SMFA Series TVS Diode

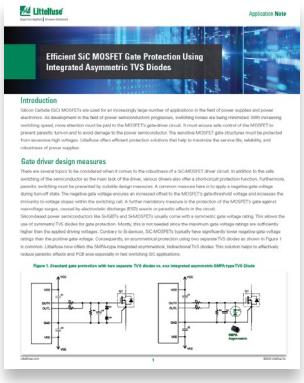


Applications

- AI / Data center server power supplies
- High-efficiency power for EVI
- High-reliability semiconductor / industrial power supplies

For more information about SMFA Asymmetric series TVS Diode, please go to:

SMFA Asymmetric TVS Diode Datasheet



Efficient SiC MOSFET Gate Protection Using Asymmetric TVS Diodes Application Note