Success Story

With Littelfuse PSR fuses and technical support, an OEM has been able to give its utility and energy storage customers the ability to meet energy demand efficiently and reliably.

PRODUCT:

PSR FLUSH END SERIES | High-Speed Semiconductor Fuses

Introduction

An OEM of solar power systems was responding to the market requirements by designing new, improved-efficiency energy storage systems with capacities ranging from 30 kW to 150 kW. The challenge for its engineers was how to ensure the reliability of the new, more efficient inverter designs.

The engineers had selected high power, insulated gate bipolar transistors (IGBTs) in the solar inverters to convert dc output from the solar panels to ac output for power transmission and consumption by users. IGBT power transistors minimize power loss with fast switching to maximize inverter efficiency. They had to assess how to prevent case rupture during short-circuit fault condition in IGBTs, which operate at both high voltage and high current.

Situation

Inadequate protection of the IGBTs can result in thermal runaway of the transistors and their destruction. In addition, the high temperature that builds up in an overheated IGBT can lead to a fire. The fire can cause significant downtime and expensive repairs. What's more, an inverter failure can force an electric utility to purchase expensive power to meet peak power demand when its energy storage system is not in service. Furthermore, the engineers had a tight schedule and needed to move quickly on selecting overcurrent protection for the new inverter.

Littelfuse experts visited the manufacturer within a week of being contacted. They educated the engineers on the various fuses available, fuse parameters and criteria, and formulas for selecting fuse ratings for their application. In addition, Littelfuse provided information on how models of their fuses comply with the IEC 6029-4 standard for fuses designed to protect semiconductor devices and prevent case rupture in IGBTs. Finally, Littelfuse presented the advantages of their semiconductor fuse over the two competitors' products which include faster interruption time, low power consumption, remote monitoring, lower costs and shorter lead times. With the depth of information provided from the Littelfuse training, samples, data sheets and website, the manufacturer was able to move quickly.

Outcome

Littelfuse exceeded the OEM's requirements with the recommendation of the PSR series of high-speed semiconductor fuses for their new inverter design. The 1000 V dc fuses had 150 kA dc interrupting rating, faster high-speed trip time, built-in and remote indication for monitoring, dc information on the product label for convenience, and various certifications. Additionally, with a willingness to educate and respond quickly, the customer saw Littelfuse as a partner versus a supplier and worked with them to select the best products for their design.

The OEM has used Littelfuse PSR fuses in thousands of applications since 2018 with zero quality issues or failures. The positive experience with Littelfuse opened the door to additional adjacent products including thermally-protected metal oxide varistors (TMOVs) and surge protective devices (SPDs) for overload and surge protection.

Quick Facts:

Industry:
Energy Storage

Application:
Protect power conversion system to prevent catastrophic failure

Customer:
Inverter OEM

End-User:
Electric Utility

Benefits:
High-speed semiconductor fuse protection with superior functionality and remote indication at a lower cost point and shorter lead time

Littelfuse®
Expertise Applied | Answers Delivered