Success Story: Gruppo PBM

Successful introduction of any type of battery charger (industrial or electric vehicle) requires the right combination of technology, components and technical expertise. In this success story, we will describe how an industrial battery charger manufacturer from Italy was able to take advantage of this combination and successfully develop their latest product offering.

Since 1973, Gruppo PBM has been the leader in industrial battery chargers, dischargers and testers. The HF9 product family is its latest offering in the high-frequency battery chargers category, and it is designed to provide the highest efficiency while achieving easy scalability for power ranging from 6 to 16 kilowatts. The three-phase supply requirement ranges from 230 Vac to 480 Vac, and the batteries are available from 24V to 80V. To achieve these requirements, Marco Mazzanti (CTO) and Giancarlo Ceo (R&D Engineer), selected components from Wolfspeed based on SiC MOSFET technology. (In contrast to SiC MOSFETs, IGBTs have serious limitations in terms of efficiency and frequency, and so they are not suitable in meeting the design requirements.)

Wolfspeed SiC MOSFETs are available in 900V, 1200V and 1700V versions. The C3M 900V range is the latest addition, and it is the industry's first 900V SiC MOSFET. For the HF9 product family, components from the C2M 1200V category were used with on-state resistances of 80 mΩ and 160 mΩ. The use of these components enabled the engineers to lower the power losses in commutation, and, together with an increased power density, this design enabled them to introduce the battery charger with increased reliability and substantial savings. In addition to the Wolfspeed SiC components, DC-DC converters from RECOM were used in this project. Overall at the system level, there was a 40% reduction in size, 20% reduction in cost, and 5% increase in efficiency.

Richardson RFPD's engineers provided constant support and solutions to the problems being encountered during the design phase. The design references from Wolfspeed were useful in designing the driver circuit, and RECOM's DC-DC converter was beneficial in creating the insulation and avoiding currents due to common mode switching of the secondary stage.