POWERMASTER SEMICONDUCTOR

Masters of Power Solution

Product Brief

Automotive 1200V Gen1 *e*SiC MOSFET

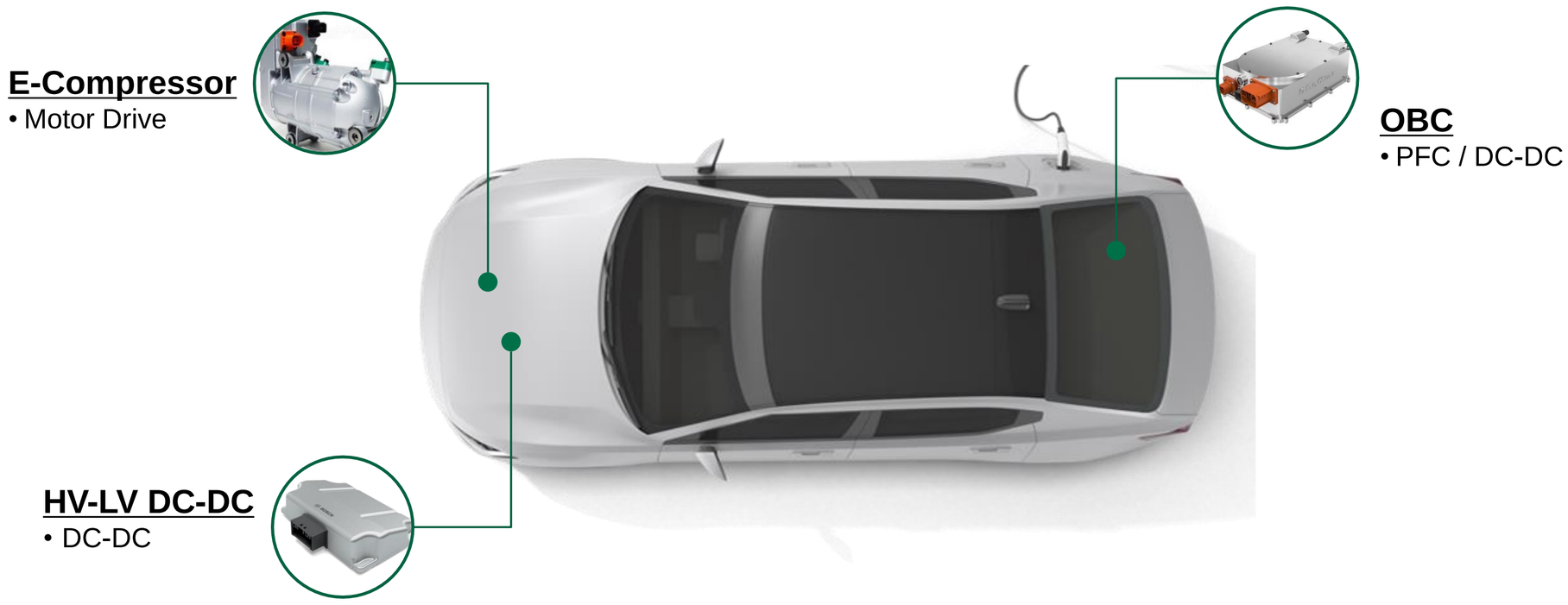
Automotive 1200V *e*SiC MOSFET designed to revolutionize power electronics in electric vehicles (EVs). Power Master Semiconductor's automotive-grade 1200V *e*SiC MOSFET offers superior efficiency, high power density, high reliability, and enables bi-directional operation, making it an ideal choice for a wide range of automotive applications, including on-board chargers (OBCs), DC-DC converters, and e-compressors.

Key Features	Key Benefits
Extremely low switching losses	Higher system efficiency
Operating temperature range : -55°C to +175°C	Better system reliability
Low switching noise	Better design flexibility
Robust avalanche capability, 100% Avalanche Tested	Better system reliability

The automotive industry is rapidly transitioning towards electrification, driven by the growing demand for sustainable and environmentally friendly transportation solutions. This shift has created a surge in demand for high-performance power electronics that can meet the stringent requirements of EV applications. Bi-directional operation is the key trend for the on-board chargers (OBCs) applications to meet V2L (Vehicle to Load), V2G (Vehicle to Grid), V2V (Vehicle to Vehicle), and V2H (Vehicle to Home appliance). Therefore, the topology of OBCs is moving to Totem-pole PFC + CLLC or DAP resonant converter from Interleaved CCM PFC or Dual boost bridgeless PFC + LLC resonant converters. Larger battery capacity and faster charging demands are driving 800V battery systems for BEV application.

The automotive grade 1200V *e*SiC MOSFET is an optimized solution for the e-compressor, an indispensable power conversion system for efficient thermal management that increases battery life, charging efficiency, and driving range, and maintains a comfortable environment. It is also optimized for Totem-Pole PFC and CLLC/DAB (Dual Active Bridge) topologies, which are essential for bidirectional power conversion, a key trend in onboard chargers (OBC) for 800V battery system in electric vehicles.

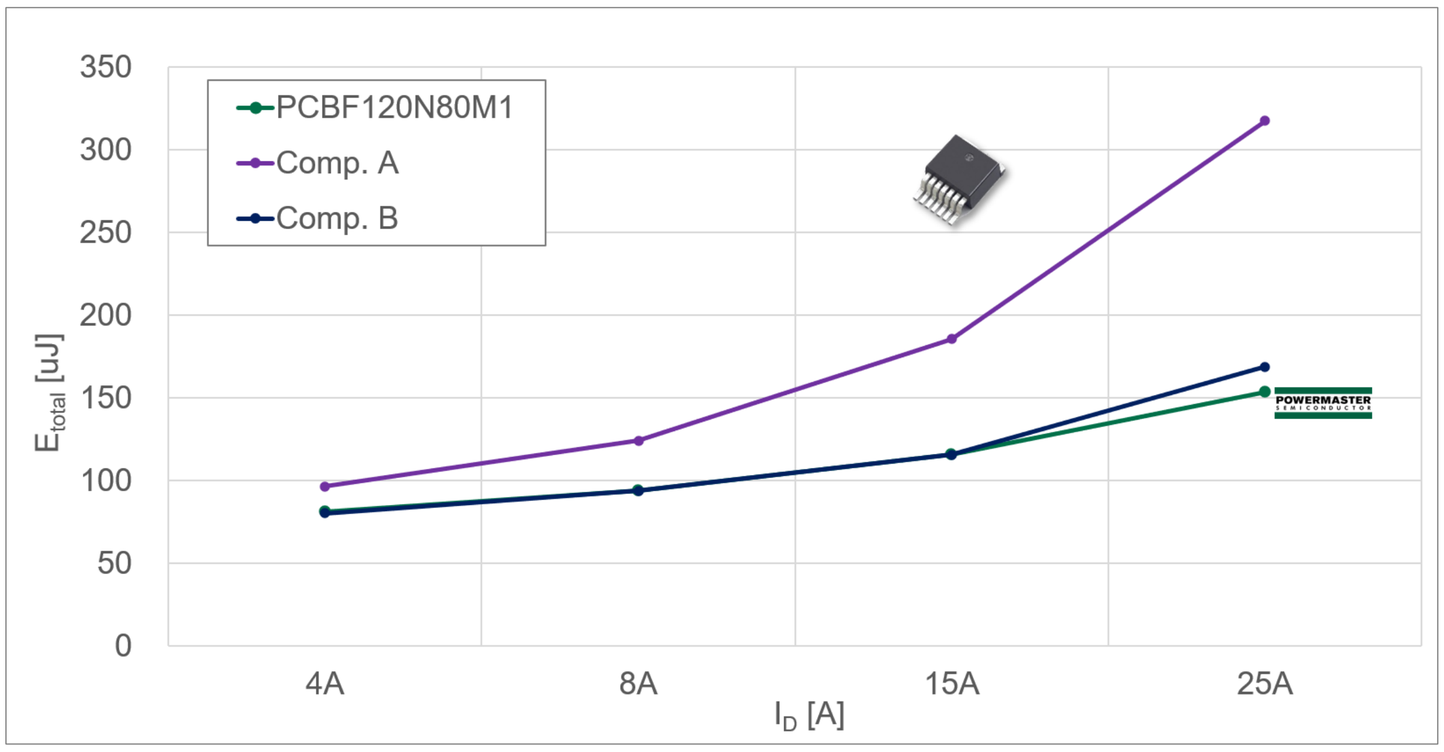
Target Applications



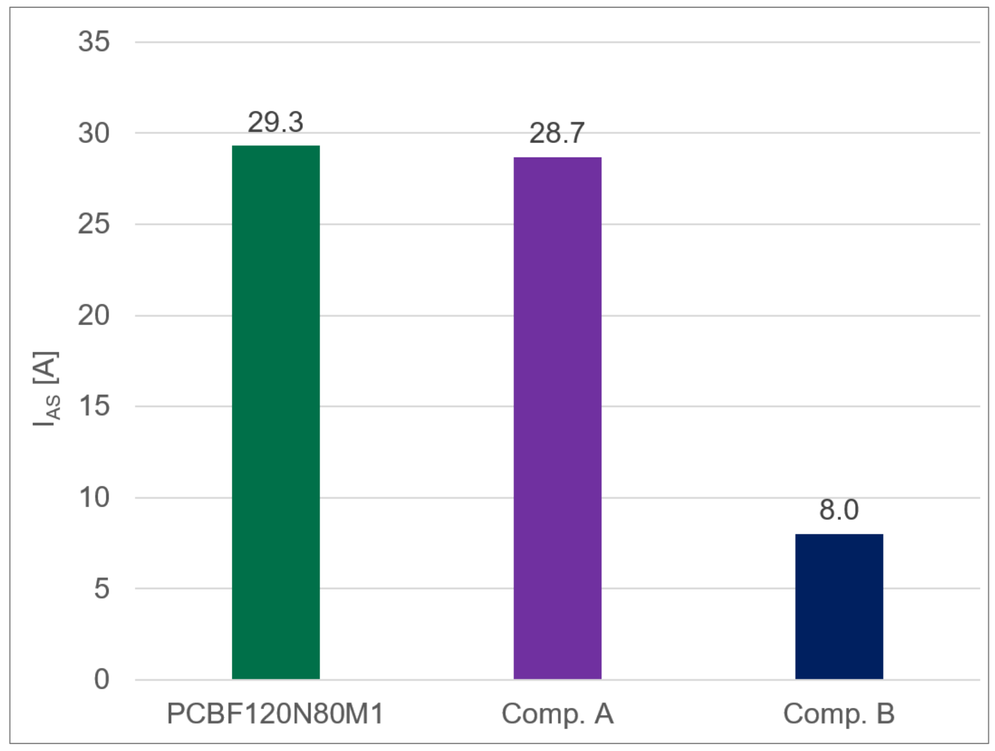
Product Brief

The PCBF120N80M1A is a 1200V / 80mΩ automotive grade *e*SiC MOSET in a D2PAK-7L package that is based on Power Master Semiconductor's *e*SiC MOSFET technology. The D2PAK-7L SMD package separates power and driver source to minimize the commutation loops. This Kelvin source connection package provides very low inductance to achieve excellent switching performance, enabling higher frequency operation and improved power density.

Lower Q_G for lower switching loss & gate driving loss



Higher avalanche capability for better system reliability



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Part Name	V_{BR}	$R_{DS(ON)}$	Package
PCZ120N40M1A	**1200V**	**40mΩ**	**TO-247-4L**
PCZ120N80M1A	**1200V**	**80mΩ**	**TO-247-4L**
PCBF120N80M1A	**1200V**	**80mΩ**	**D2PAK-7L**

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