

BRIEF INFORMATION

High Voltage DC/DC Converter

- › Two versions available: 400 V to 12 V and 800 V to 12 V
- › Bidirectional power transfer capability
- › Passive air cooling – no liquid cooling circuit required
- › Low-latency dynamic regulation
- › Several power converters could be used in cascading mode to realize the needed power
- › Modular power extension enables scalable support for high-power demands in high end/premium/luxury vehicle configurations (extraordinary LV Loads compared to standard configuration like refrigerator or tool charging socket)
- › Reliable low-voltage power supply for highly automated driving systems
- › Peak efficiency >96 % – High efficiency at partial load operation

PRODUCT FEATURES

Application

A high voltage DC/DC converter is used to convert a high voltage direct current (DC) to a LV DC voltage and vice versa. Our application is available for 400 V and 800 V HV DC sources and targets a 12 V LV Boardnet. This ensures that all low-voltage components receive a stable and reliable power supply.

The HV DC/DC converter supplies stable 12 V power for low-voltage systems, providing reliable energy for components such as lighting (headlights, interior lights), Infotainment and navigation, Instrument cluster and dashboard electronics or to charge the 12 V auxiliary battery.

It also powers critical safety and control components such as electronic braking systems, steering control units, airbags, and advanced driver assistance systems, ensuring reliable operation at all times.

The high voltage DC/DC converter enables the initial boot-up of electronic control units (ECUs) and communication modules before the high-voltage system is fully active, ensuring all essential systems are ready for operation as soon as the vehicle starts.

A secondary DC/DC converter provides redundancy and backup power, ensuring the continued operation of essential systems in the event of a high-voltage system failure.

Design and Function

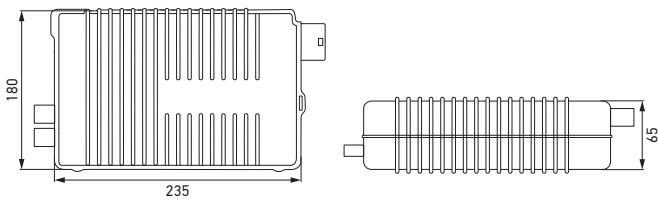
The innovative single-stage architecture of our DC/DC converter minimizes system complexity and is engineered for optimal cost efficiency, offering two variants for 400 V and 800 V applications.

Its passive air cooling concept eliminates the need for water cooling, while the device delivers a continuous power class of 1.2 kW (with a peak of 2 kW) in both buck and boost operating modes.

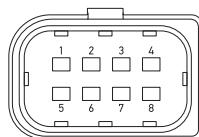
TECHNICAL DETAILS

Technical data	
HV Voltage Range	400 V: 220 V – 470 V 800 V: 340 V – 850 V
LV Voltage Range	6 V – 16 V
Volume	2.45 l
ASIL Level	ASIL Level B
Energy transfer	Bidirectional
Continuous maximum current	Up to 80 A continous
Temperature range	Ambient: -40 °C to +85 °C
Storage temperature	-25 °C till +85 °C and 80% Humidity (not recommended to store longer beyond +70 °C)
Cooling Concept	Passiv air cooling
Efficiency	> 96%
Communication interface	CAN
Vibration resistance	Complies with ISO 16750-3 (3.19 g)
Protection class	IP 5KX, IP X4K (depending/limit on existing connector)
Threaded bolt, ground connection	Groundconnection via low voltage connector
Weight	2.8 kg
Material / Casing type	Aluminium diecast housing with aluminium sheet metal cover
Connectors	HV-/LV-connector: publicly available connector (details can be shared upon request) Signal connector: publicly available 8-pins (details can be shared upon request) Mating connector: publicly available (details can be shared upon request)
Lifetime	15 years Time in driving working condition: approx. 8.000 h Time in AC/DC Charging working condition: appr. 2.000 h (loading of LV Batt) Standby with HV Battery connected approx. 20.000 h
Approved	UN-R10 on request
Compliant	IATF 16949, VDA standards (e.g. VDA 6.3), Automotive SPICE, OBD specifications according to the current law, SAE-J1978, SAE-J1979, SAE-J1979-3, SAE-J2012, SAE-J1699, E117
ESD Protection	Yes
Constant power	With active air cooling 1.5 KW, with passive air cooling 1.2 KW
Peak power	2 kW

Dimensional sketch



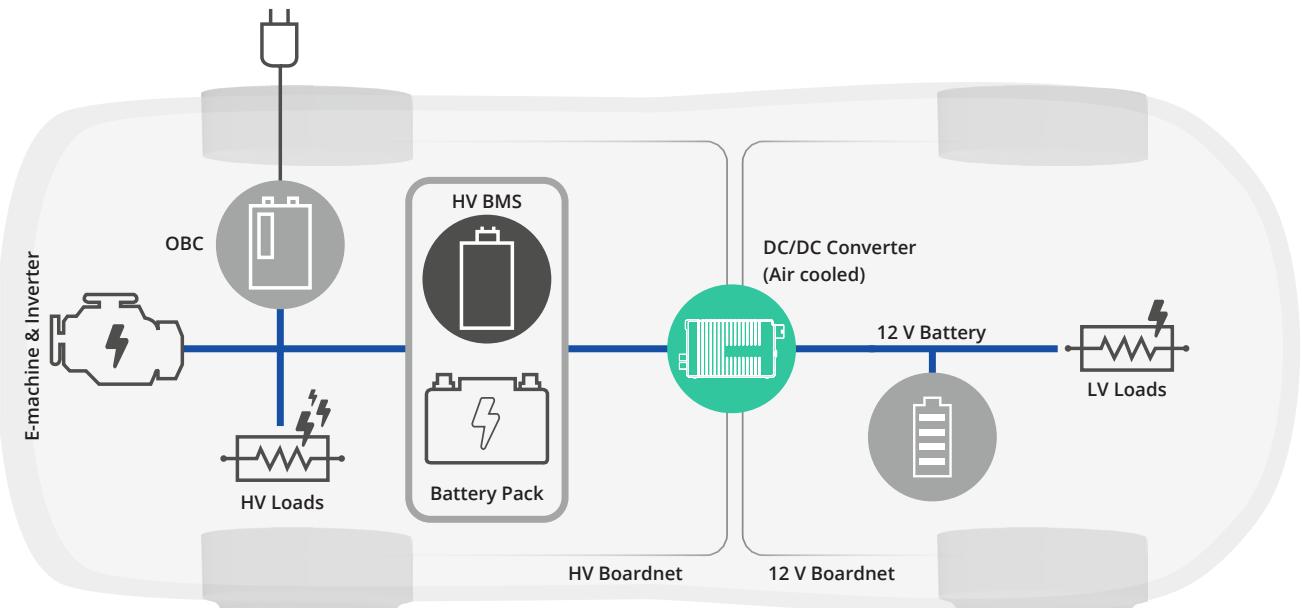
Pin assignment



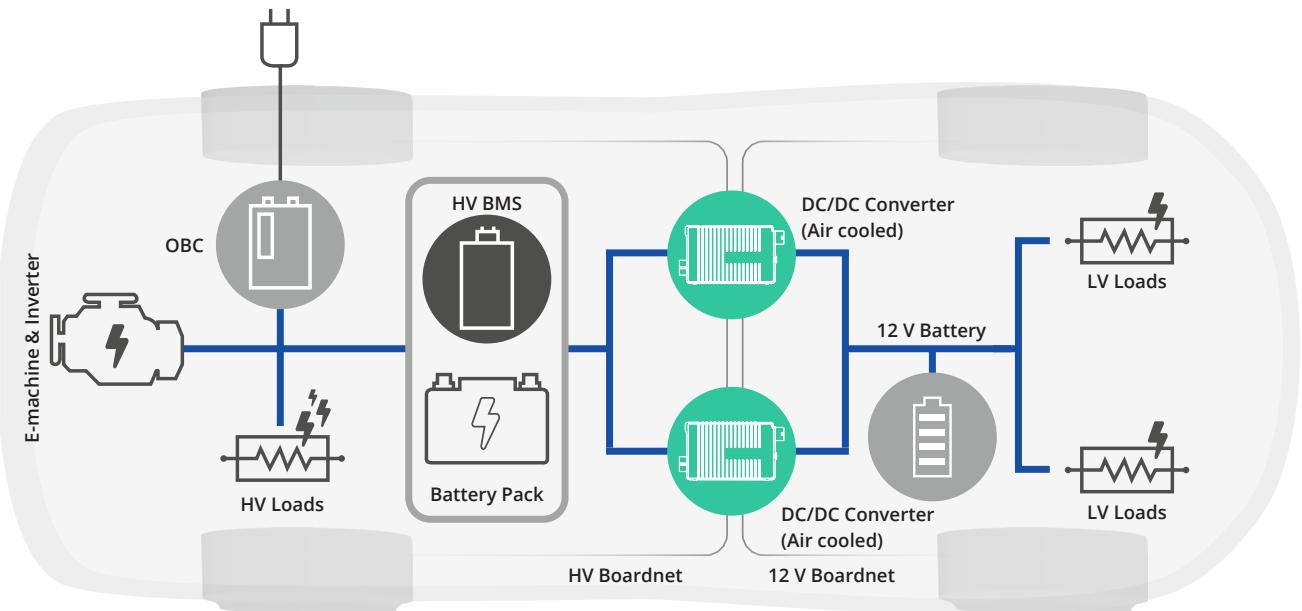
Pin 1: CAN Hi 1
Pin 2: HVIL out
Pin 3: Terminal 30C (analog crash signal)
Pin 4: CAN Hi 2
Pin 5: CAN Lo 1
Pin 6: HVIL in
Pin 7: NC (Reserve)
Pin 8: CAN Lo 2

USE CASES

The following two examples illustrate selected use cases from a broader range of application scenarios



Exemplary architecture for LV loads up to 1.2 kW peak



Power extension – in case the standard HV DC/DC converter can't deliver sufficient power for the high end configuration of the vehicle. Two or more HV DC/DC converters combined to reach necessary power level.

PROGRAM OVERVIEW

Product picture	Description	Part number
	High Voltage DC/DC Converter (400 V to 12 V Boardnet)	On request
	High Voltage DC/DC Converter (800 V to 12 V Boardnet)	On request