

Tesla Demonstrator: Flexible 400 & 800 Volt Powertrain Architecture



Exploring Advanced Electric Drivetrain Technologies from SiC to GaN

AVL's Tesla demonstrator showcases advanced electric drivetrain technologies in a real vehicle environment.

Built around a high-speed e-axle and a flexible 400 and 800 Volt powertrain architecture, the platform explores the next generation of power electronics, from today's SiC solution to future GaN-based inverter implementation. It enables the evaluation of future power electronics concepts, vehicle control strategies and highly integrated EV propulsion systems.

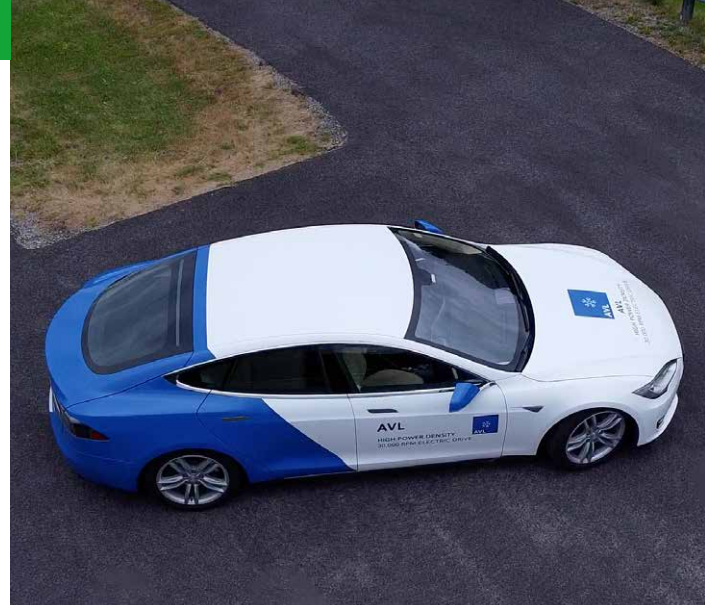
CUSTOMER BENEFITS

- High power density for compact EV drivetrains
- Improved efficiency through SiC and GaN technology
- Enhanced vehicle dynamics with torque vectoring
- Scalable technology for next-generation EV platforms

AVL CONTRIBUTION

- High-speed e-axle architecture
- Dual-inverter powertrain integration
- DC boost converter integration
- Vehicle motion control development

GaN power modules by



DC Boost Converter

TECHNICAL FACTS

- Dual-motor high-speed e-axle
- Up to 30,000 rpm & 5,500 Nm wheel torque
- 850 V architecture with DC boost converter
- SiC inverter or GaN inverter (VisiC power modules)
- Up to 99.6% system efficiency
- Torque vectoring and yaw moment control
- 0–100 km/h in 5 s | Top speed 240 km/h