

Title: High voltage inverter solution

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Who develops high voltage inverter systems for electric vehicles?

The vehicle manufactures and automotive tier 1 suppliers develop inverter systems for electric vehicles. Discussions were held with their design and research teams during direct meetings to understand future developments. Through these discussions, along with our own research, there are some clear high voltage inverter trends in the EV market. 3.

How can a high voltage inverter improve EV performance?

A better approach is to increase efficiency and decrease weight which extends the range of the EV and potentially reduces vehicle cost and running expenses. A significant contributor to achieving this is the inclusion of enhanced control, high voltage inverter modules in the vehicle. * Corresponding author.

What is a traction inverter?

These inverters, called traction inverters, usually transfer power in the tens-of-kilowatts range (+50kW). The power switches used in these full-bridge topologies are insulated gate bipolar transistors (IGBTs). Typical voltage levels for the power switches are 600V to 1200V.

Why do traction inverters need a SiC power module?

Since the power levels in traction inverters are significantly higher compared to those in OBCs, the current solution is a SiC power module. SiC power modules can reduce parasitics such as ringing, improving switching speed and increasing power density.

What type of power switch is used in a three-phase inverter?

The power switches used in these full-bridge topologies are insulated gate bipolar transistors (IGBTs). Typical voltage levels for the power switches are 600V to 1200V. Considering the high power levels and voltage levels, a three-phase inverter uses six isolated gate drivers, as shown in Figure 2.

How many gate drivers does a 3 phase inverter use?

Considering the high power levels and voltage levels, a three-phase inverter uses six isolated gate drivers, as shown in Figure 2. Each phase uses a high- and low-side IGBT switch, usually operating in the 5kHz to 20kHz range, to apply positive and negative high-voltage DC pulses to the motor windings in an alternating mode.

EV/HEV Traction inverter converts energy stored in a battery to instantaneous multiphase AC power for a traction drive. Usually half-bridge configuration per module. Three ...

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