

SolarTech Power Solutions

Plateau inverter power



Overview

Do traction inverters reduce power losses?

Demand to reduce power losses will continue with the development of inverters that have higher power levels, especially as the number of motors per car increases, and trucks migrate to pure EV. Traction inverters have traditionally used insulated-gate bipolar transistors (IGBTs).

How can EV traction inverters improve Ev DRIVE range?

With EV traction inverters increasing in power to over 150 kW, choosing an isolated gate driver with maximum current strength through the Miller plateau can reduce SiC MOSFET power losses and enable faster switching frequencies and therefore higher efficiency which would improve new EV model drive range.

How can power system engineers improve traction inverter efficiency?

With increasing competition between electric vehicle (EV) manufacturers to develop models with lower cost and longer drive range, power system engineers are under pressure to reduce power losses and improve traction inverter system efficiency, which can improve driving ranges and provide a competitive advantage.

What is a gate driver in an EV traction inverter?

The gate driver provides low- to high-voltage (input to output) galvanic isolation, drives the high- and low-side power stages of the SiC or IGBT-based three-phase motor half bridges, and enables monitoring of and protection against various fault conditions. Figure 1. EV Traction Inverter Block Diagram.

What happens when a plateau reaches its on-state value?

Once the plateau is finished (when V_{ds} reaches its on-state value), then the C_{gd} becomes constant and the gate-current flows into C_{gs} . The slope is not as steep as it was in the first period, i.e. t_2 , because C_{gd} is larger and closer in

magnitude to that of C_{gs} . Figure 2: MOSFET turn-on switching waveform.

Why is power loss important in power converter design?

Abstract—Power loss calculations are critical to a power converter design, helping with estimation of efficiency, switch selection and cooling system design. Moreover, power losses in a MOSFET may limit the maximum switching frequency in a power converter.

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