

SolarTech Power Solutions

Inverter ripple voltage



Overview

How DC-link current and voltage ripple affect inverter performance?

Abstract Inverter's performance and operating mode may be negatively affected by inverter input (dc-link) current and voltage ripple. It is a common experience that even theoretically balanced load.

Does voltage ripple affect DC-link capacitance in automotive traction voltage source inverters?

Abstract: The voltage ripple is the predominant dc-link capacitor design parameter in automotive traction voltage source inverters. Therefore, the reduction of the voltage ripple results in the decrease of the dc-link capacitance.

Why is DC-link current ripple important in a five-phase inverter?

Therefore, a thorough analysis of the dc-link current and voltage ripples on the capacitor in a five-phase inverter is essential for both optimal capacitor design and accurate performance evaluation. For the capacitor, high-frequency dc-link current ripple is introduced due to the PWM of the inverter .

Why do inverter switching actions reduce DC-link voltage ripple?

Consequently, the pulsating current flowing from the inverter to the dc source can be effectively reduced . This, in turn, mitigates the dc-link voltage ripple, ensuring a relatively stable dc-link voltage under inverter switching actions .

How DC-link voltage ripple amplitude is calculated?

The dc-link voltage ripple amplitude is calculated in Refs. [23, 24], and the dc-link capacitor design is proposed based on the dc-link voltage switching ripple requirements for five- and seven-phase inverters, respectively. The impact of the number of phases on input current ripple has been analysed in Ref.

What is output voltage ripple?

Output-voltage ripple is the alternating current (AC) component of the direct current (DC) output voltage. It's generated by a combination of factors, including the output capacitor's equivalent series resistance (ESR), the voltage drop across the output capacitance, duty cycle and switching frequency.

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