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Design and Implementation of Trans-Z-Source Inverter

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Abstract

ABSTRACT

This paper presents the impedance-source (Z-source) inverters concept to the transformer-based Z-source (trans-Z- source) inverters. The original Z-source inverter (ZSI) contains an impedance network of two inductors and two capacitors connected in a unique arrangement to interface the dc source and the inverter. It has buck and boost function that cannot be achieved by traditional voltage-source inverters and current- source inverters. In the proposed trans-Z-source inverter, the impedance network consist of a transformer and one capacitor. While retaining the main features of the previously presented Z-source network, the new networks exhibit some unique advantages, such as the increased voltage gain and reduced voltage stress in the voltage-fed trans-ZSIs .when the turns ratio of the transformer windings is over 1. Simulation and experimental results of the voltage-fed trans-ZSIs are provided to verify the analysis.

Keywords- dc-ac conversion, voltage-source inverter, Z-source inverter.

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