

Power Converter Applications in Electric Vehicle Charging: Exploring Matrix Converters for Grid-to-Vehicle (G2V) Charging Infrastructure

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Abstract

- Document Sections
- I. Introduction
 - II. EXISTING SYSTEM
 - III. Proposed grid to vehicle (G2V) WPT by using matrix converter
 - IV. Computational simulation model
 - V. Results and discussions

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Authors

Figures

References

Keywords

Metrics

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Abstract:

This paper presents a matrix converter-based bidirectional G2V wireless charging for EVs by single phase matrix converter (SPMC). It is the beginning of the G2V (Grid-to-Vehicle) present Installing a wireless IPT G2V charging will capacitate the utilization SPMC factor. Through the incorporation of the AC-AC converter, the working stage creates a single-stage frequency, from 50 Hz to 20 kHz (with frequencies ranging from 50 Hz to 20 kHz). Traditional topology is used, where the multiple transformers (AC~DC~AC) are utilized for smooth operation, which causes extra difficulties like weight, reliability, and poor efficiency. The simulation results suggested that the switch-type GTOs in combination with Si thin-film blocking diodes enable the production of zero variable voltage without any barriers on output frequency that permit circulating power with pure sine waves in the absence of contact. This research paper shows that matrix converters have significant features to improve the charging network and EV mobility.

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I. Introduction

The rush in electric vehicle (EV) adoption has suggested a critical revaluation of the associated charging infrastructure to meet the escalating demand for efficient and flexible solutions. In this context, the integration of power converters, particularly the application of matrix converters, emerges as a pivotal avenue for advancing the capabilities of EV charging systems. The in

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 es with various electronic equipment for wireless charging systems [1]. This provides contactless charging on a wide range in applications. For designing bidirectional inductive power transfer (BD-IPT) is much more capable for the operation of G2V as well as

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