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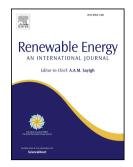
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## Single-Phase Single-Stage Dual-Buck Photovoltaic Inverter with Active Power Decoupling Strategy

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Email: yhcho98@konkuk.ac.kr 8 Corresponding author: Younghoon Cho 9 Abstract- This paper proposes a single-phase single-stage dual-buck photovoltaic (PV) inverter 10 with an active power decoupling (APD) strategy. Using this strategy, the dc-link voltage pulsating 11 12 caused by a low-frequency power fluctuation in single-phase systems can be reduced without using a bulky dc-link storage. A simple active damping control is adopted to suppress the resonance of the 13 APD circuit, so that the design of the feedback control becomes simple and reliable. Furthermore, 14the APD circuit directly regulates the dc-link voltage, which is identical to the PV voltage in single-15 16 stage PV inverters. Hence, the dc-link voltage control in the given power stage, where the 17unidirectional dual-buck topology is employed, is supplemented. The APD strategy can be 18 universally applied in single-stage PV inverters regardless of the topology connected to the utility 19 grid. To verify the proposed scheme, both simulations and experiments on a 2.1 kW single-phase 20 single-stage dual-buck PV inverter are conducted. The results confirm that the proposed method not only reduces the dc-link voltage pulsating but also improves the MPPT accuracy. Compared to 21 the power stage using electrolytic capacitors, the proposed scheme decreases the physical size and 22 23 implementation cost of the dc-link storage.

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power point tracking, dual-buck inverter

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*Keywords:* photovoltaic systems, inverter, converter, active power decoupling, maximum

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