

ANALYSIS AND DESIGN OF HIGH STEP-UP BOOST CONVERTER INTEGRATED WITH SEPIC CONVERTER

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ABSTRACT

For a nonisolated high step-up converter, the combination of a boost converter with a series output module is investigated in this paper. As a solution to supplement the insufficient step-up ratio and distribute a voltage stress of a classical boost converter, a sepic-integrated boost (SIB) converter, which provides an additional step-up gain with the help of an isolated sepic converter, is proposed. Since the boost converter and the sepic converter share a boost inductor and a switch, its structure is simple. Moreover, the SIB converter needs no current snubber for the diodes, since the transformer leakage inductor alleviates the reverse recovery. The operational principle and characteristics of SIB converter are presented, and verified experimentally with a 200W, 42 V input, 400 V output prototype converter.

KEYWORDS: High step-up converter, boost converter, sepic converter.