A Novel Method to Design Power Converter for Energy Harvesting System

Abstract

In today’s world, there is a huge demand for portable electronic systems such as RFID cards, PDA, watches, calculators, cell phones, flash memories, MEMS, LCD drivers etc. The limited battery lifetime is the main concern of many portable systems. Energy harvesting system overcomes these problems by converting non-conventional energy into useful energy. The power converter plays an important role in boosting low voltage available from transducer hence; they are key element in energy harvesting system. The topologies and design specification such as low on-chip power requirement, high power efficiency, less area etc. of power converter varies widely as per the application. In this work, a new method is proposed
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to design power converters of desired specifications. This method is designed in MATLAB Simulink and Orcad environment and helps user to optimize the parameters such as boosting capacitance value, transistor sizing value, number of stages etc. This method can be used by designers as the first step to evaluate all the performance parameters before actual chip fabrication. Thus it will give user confidence in its design, save valuable time and overall design cost. The various topologies of power converters such as Basic Dickson, Modified Dickson and Cross-Coupled Voltage Doubler are designed using this method and shows better performance results.

References

- O. A. Ahmed and J. A. M Bleijs, "PSpice and Simulink Co-Simulation for High
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Efficiency DC-DC Converter using SLPS Interface Software”, Power Electronics, Machines and Drives, 2010.

Index Terms

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Power Converter  Energy Harvesting  Cts (charge Transfer Switch)  Mos.