

Single Ended Primary Inductance Converter with Internal Model Controller

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Abstract : In this article, the study and analysis of Single Ended Primary Inductance Converter (SEPIC) are presented for battery charging applications that will be used in military applications. The usage of this kind of converters come from its advantage of non-reverse polarity at outputs. As capacitors charge and discharge through inductance, peak current does not occur on capacitors. Therefore, the efficiency will be high compared to buck-boost converters. In this study, the converter (SEPIC) is designed to be operated with Internal Model Controller (IMC). The traditional controllers like Proportional Integral Controller are not preferred as its linearity behavior. Hence IMC is designed for this converter. This controller is a model-based control and provides more robustness and better set point monitoring. Moreover, it can be used for an unstable process where the conventional controller cannot handle the dynamic operation. Matlab/Simulink environment is used to simulate the converter and its controller, then, the results are shown and discussed.

Keywords : DC/DC converter, single ended primary inductance converter, SEPIC, internal model controller, IMC, switched mode power supply

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