Design of an Inductor DC Resistance Current Sense for DC-DC Converters

Background

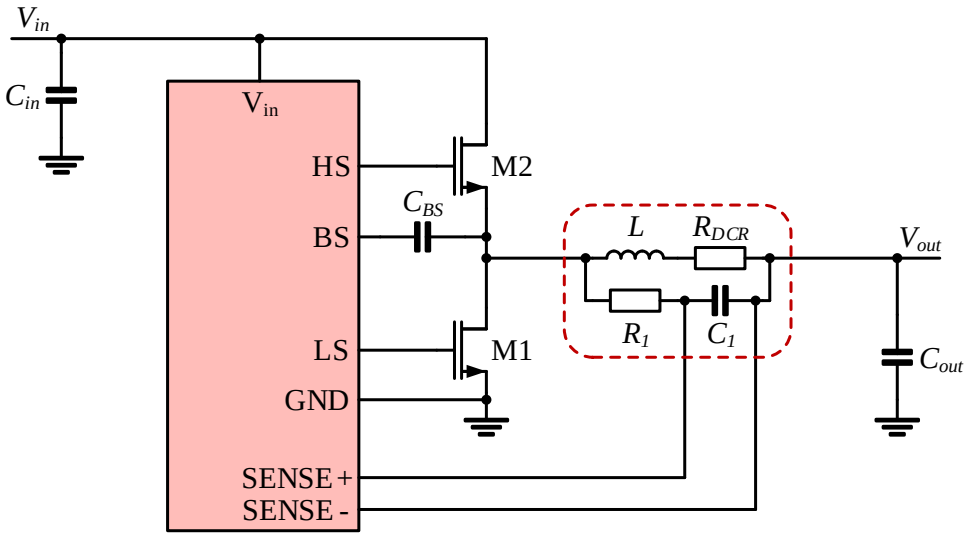
The research conducted at IAS focuses on integrated power electronics in different applications, such as efficient voltage transformation via integrated DC-DC converters.

In todays designs the supply voltage is very small, but the supply current increases. To maintain high efficiencies, all resistive losses have to be minimized. Traditional current sense concepts utilize a sense resistor for current measurement. Despite the increased losses, this technique also requires an expensive and large external component. Inductor DC resistance (DCR) current sensing employs the parasitic DC resistance of the inductor to measure the current and is therefore a lossless sensing technique.

Integrated DC-DC converter utilize the inductor current information in different control strategies and for peak current limit. A precise and fast current sense is one of the main building blocks, in the design of integrated switch mode regulators.

Task

This thesis aims to design a DCR current sense with temperature compensation for integrated DC-DC converters. The design will be implemented in a state-of-the-art CMOS power technology.



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