**TITLE:** DC-DC Buck Converter using eSim.

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## PROBLEM STATEMENT:

The objective of this project is to design and optimize a DC-DC buck converter capable of efficiently converting a higher input DC voltage to a stable, lower output voltage, which is crucial for various applications like portable devices, electric vehicles, and renewable energy systems. The converter should maintain high efficiency, low voltage ripple, and stable performance across a range of load conditions. Key design challenges include minimizing energy losses, achieving rapid transient response, reducing the size of passive components, and ensuring thermal stability. The resulting converter will serve as a model for reliable, compact power management solutions in modern electronics, supporting applications that demand both energy efficiency and consistent output stability.
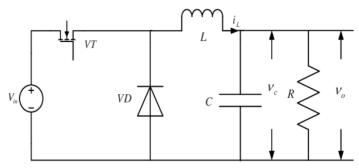


*Figure 1 DC-DC Buck Converter*

**TITLE OF THE PAPER:** Design and Simulation of Synchronous Buck Converter in Comparison with Regular Buck Converter.

## REFERENCE:

[1] A.Asghari, "Ultra-high step-down ZVS synchronous buck converterwith low switch voltage stress,"IET Power Electronics,vol. 13, no. 10,pp. 2039-2048,2020,https://doi.org/10.1049/iet-pel.2019.1113.

[2] S.Kapat, "Sampling-induced border collision bifurcation in a voltage-mode DPWM synchronous buck converter,"IEEE Transactions on Circuitsand Systems II: Express Briefs,vol. 66, no. 6,pp. 1048-1052,2018

[3] G.Zhang, Z. Li, B. Zhang, and W. A. Halang, "Power electronics converters: Past, present and future,"Renewable and Sustainable Energy Reviews, vol. 81,pp. 2028-2044, 2018,