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# DESIGN OF A BUCK CONVERTER FOR STABLE VOLTAGE OUTPUT IN NANOSATELLITE APPLICATIONS

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# Abstract

In a nanosatellite or CubeSat operation, the size, weight and power efficiency of the satellite are critical. Traditional linear regulators, being inefficient and prone to excessive heat generation, are unsuitable for these applications. This project designed a buck converter to address these issues by efficiently reducing voltage and minimising power losses. The process included a comprehensive literature review, parameter determination, circuit design, and implementation on a printed circuit board (PCB) using KiCad. This project successfully achieved the design of a buck converter that steps down a +28 V input to a +5 V output and is capable of supplying current of up to 3 A to the load. Simulation results facilitated optimisation, leading to a highly efficient and stable buck converter suitable for CubeSat power regulation, thereby advancing robust power solutions for space missions. © 2025 Science and Technology Research Institute for Defence (STRIDE). All rights reserved.

## Author keywords

Buck converter; CubeSat; DC-DC conversion; KiCad; voltage regulation

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