

This thesis is about the study and development of a GaN-based 48V/12V DC-DC buck converter. It converts the 48V DC input and provides steady-state 12V output. The necessity for the product, its functionality, a survey of the market, the literature, and the user base are all compiled in Chapter 1. These surveys are used to analyze gaps and create wish lists for the products. The identification of the different modules needed to construct the product is completed in Chapter 2.

A block-level diagram of the product is created, and various stimuli to each and every module are discussed. A target specification is written down at the end of this chapter after studying each and every module and taking the desired requirements into consideration. Every module's intricate design is provided in Chapter 3. Every software module has extensive algorithm flow charts and every hardware module has thorough circuit schematics. This chapter goes into detail on the design of numerous components that are needed to achieve the required standards.

The product's engineering and fabrication are covered in Chapter 4. Every information pertaining to the routing, mounting, and assembly of the hardware modules on the PCB is provided. The recommendations for the upcoming generation and the product's future scope round out Chapter 5.