Forward Converter

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Converter Specifications

In this topic, a forward converter that provides stable 5-volt power, suitable for USB-powered devices, will be designed and implemented. The input voltage range is 24–29 V. The forward converter can be implemented using either a single-transistor approach with an additional tertiary (demagnetizing) winding in the transformer primary, or a two-transistor approach that does not require a tertiary winding in the transformer. However, the choice of the number of transistors affects the switching losses of the converter. The electrical specifications and quality characteristics are listed in Table 1.

Converter Electrical Specifications	
Input voltage	24 – 29 V
Output voltage	5 V
Max output current	10 A
Quality Characteristics	
Efficiency	> 70 %
Max Output voltage ripple	50 mV

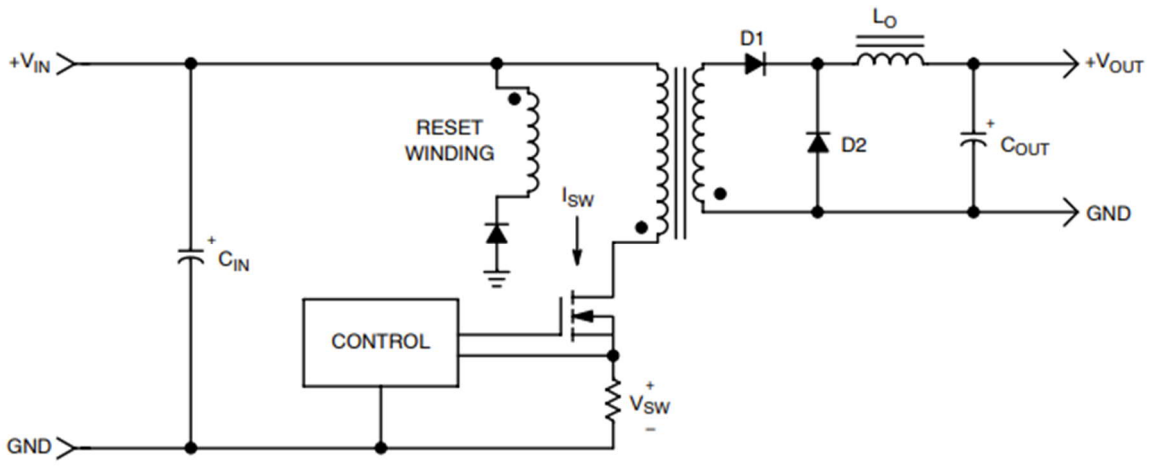

Figure 1. Schematic of forward converter (one transistor and tertiary winding approach).

Main tasks:

- Final topology selection/transformer design
- Output filter component design
- Control design
- Implementation