

Exercise 1

A boost converter is tested with a resistor $R = 60\Omega$ and the output average current is $I_o = 0,3A$. The other parameters are $U_d = 12V$, $L = 150\mu H$, $C = 470\mu F$ and $f_s = 20kHz$. There is no feedback control over the output voltage, i.e. the control ratio D is constant. What happens when the resistor R is removed. It is assumed that the resistor is removed when the switch is conducting.

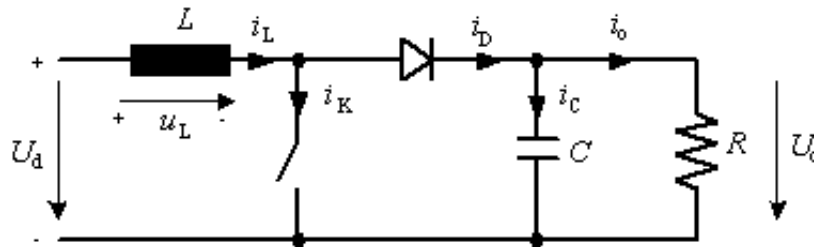


Figure 1: Boost converter.

Exercise 2

Draw output power $P_o(t)$ of the full-bridge with an bipolar and unipolar control when the output voltage $U_d = 40V$, the emf of the motor is $e_a = 24V$ and the output current $I_o = 12A$. An inductance $L = 150\mu H$ is in series with the load and a switching frequency $f_s = 20kHz$. It can be assumed that the output voltage is constant (large capacitance in the output that is not represented in the figure 2).

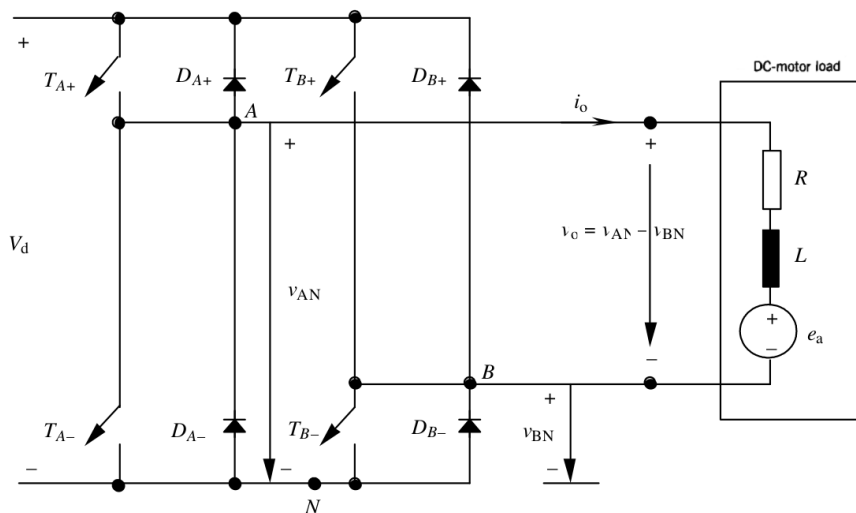


Figure 2: Full-bridge converter.

References

- [1] N.Mohan, *Power Electronics, Converter Applications, and Design*, 3rd edition, John Wiley & Sons, Inc., 2003, ISBN 978-0-471-22693-2.