NANYANG TECHNOLOGICAL UNIVERSITY
SCHOOL OF ELECTRICAL & ELECTRONIC ENGINEERING
EE4341/EE6341 ADVANCED ANALOG CIRCUITS
TUTORIAL 10

1. Design a DC-DC Buck-Converter as shown in Fig. 1 with specifications: V_s = 48 V, V_o = 28 V, R_L = 8 Ω and output ripple voltage < 0.5%. The switching frequency f_s = 40 kHz. Assume all the components are ideal. Specify the inductor and capacitor values and their respective voltage and current ratings. The inductor should be sized such that it is 30% higher than the minimum value to ensure continuous inductor current.

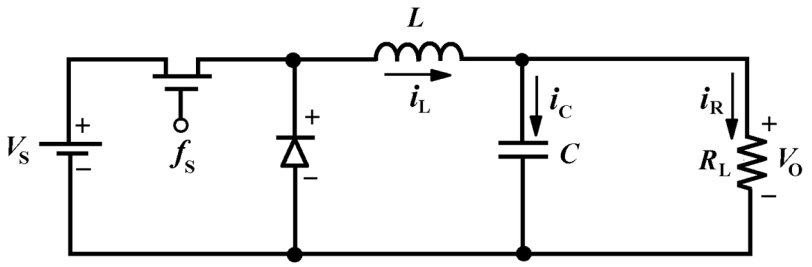

Figure 1

2. Design a DC-DC Boost Converter as shown in Fig. 2 with specifications: V_s = 24 V, V_o = 36 V, load power = 50 W and the output voltage ripple < 0.5%. The switching frequency f_s = 50 kHz. To ensure continuous inductor current, the inductor value must be chosen such that the current ripple of the inductor is limited to 40% of the average inductor current. Determine the values of inductor and capacitor and their respective voltage and current ratings. Assume all components are ideal.

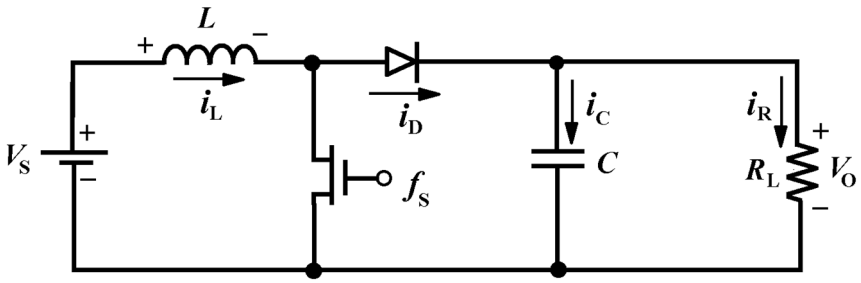

Figure 2