

Correction to exam solution 120412

4c)

Calculate the maximum current through the inductor L.

$$\text{Current increase during switch on time: } \Delta i_L = \frac{v_L T_{sw} D}{L} = 3.6 \text{ A.}$$

$$P_{in} = P_o = 12 * I_{in} = 48 * 0.6 \Rightarrow I_{in} = 2.4 \text{ A.}$$

The input current which is the same as the inductor current is flowing continuously. Related to continuous inductor current, the peak current is the average current plus half of the current increase during the switch on-time:

$$i_{Lmax} = I_{in} + \frac{\Delta i_L}{2} = 2.4 + 1.8 = 4.2 \text{ A}$$

This also gives the minimum value of the inductor current:

$$i_{Lmin} = I_{in} - \frac{\Delta i_L}{2} = 2.4 - 1.8 = 0.6 \text{ A}$$

Tomas Jonsson