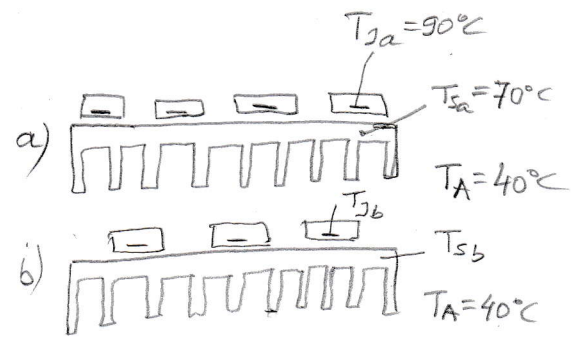
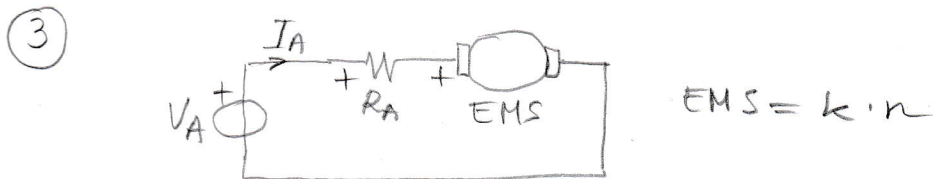


① $P_a = 30 \text{ W} = \frac{r_{DS(on)}}{4} I_D^2$; $P_{a1} = \frac{P_a}{4} = \frac{30}{4} = 7,5 \text{ W}$
 $P_b = \frac{r_{DS(on)}}{3} I_D^2 = \frac{4}{3} P_a = 40 \text{ W}$; $P_{b1} = \frac{P_b}{3} = 13,3 \text{ W}$

 $R_{\theta SA} = \frac{\theta_s - \theta_A}{P_a} = \frac{70 - 40}{30} = 1 \text{ K/W}$
 $T_{sb} = T_A + R_{\theta SA} \cdot P_b = 40 + 1 \cdot 40 = 80^\circ \text{C}$
 $T_{ja} = T_{sa} + R_{\theta JS} P_{a1} = 90^\circ \text{C}$
 $R_{\theta JS} = \frac{T_{ja} - T_{sa}}{P_{a1}} = \frac{90 - 70}{7,5} = 2,67 \text{ K/W}$
 $T_{jb} = T_{sb} + R_{\theta JS} \cdot P_{b1} = 80 + 2,67 \cdot 13,3 = 115,5^\circ \text{C}$



② $I_P \cdot V_P = I_B U_B \Rightarrow I_P = \frac{I_B U_B}{V_P} = \frac{7 \cdot 28}{20} = 9,8 \text{ A}$
 $\frac{U_B}{V_P} = \frac{D}{1-D} \Rightarrow V_P \cdot D = U_B(1-D) \Rightarrow D(V_P + U_B) = U_B \Rightarrow D = \frac{U_B}{V_P + U_B} = \frac{28}{20+28} = 58,3\%$
 $I_{Dmax} = I_{L1} + I_{L2} = I_P + I_B = 9,8 + 7 = 16,8 \text{ A}$
 $V_{DSmax} = V_{CO}$
 $(V_{CO} - V_P)(1-D) = V_P \cdot D \Rightarrow V_P \cdot \frac{D}{1-D} = V_{CO} - V_P \Rightarrow V_P \left(\frac{D}{1-D} + 1 \right) = V_{CO} \Rightarrow V_P \frac{1}{1-D} = V_{CO} = 47,96 \text{ V}$
 $k = \frac{P_o}{V_{DSmax} \cdot I_{Dmax}} = \frac{28 \cdot 7}{47,96 \cdot 16,8} = 0,243$

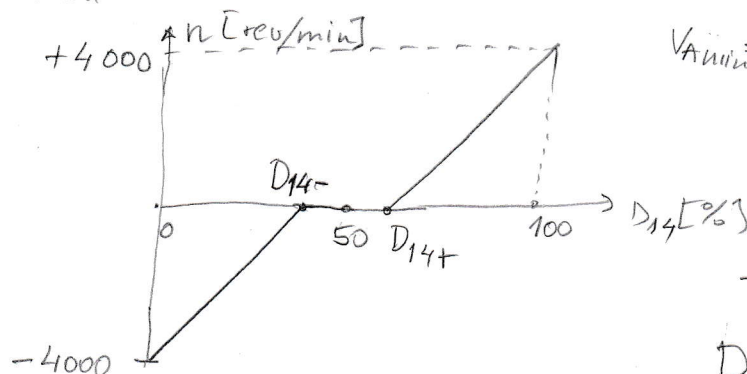


$$V_A = R_A I_A + EMS = R_A I_A + k n$$

$$R_A = 0,6 \Omega; I_A = 10 \text{ A}, V_A = 50 \text{ V}; (D_{14} = 100\%)$$

$$50 = 0,6 \cdot 10 + k \cdot 4000 \Rightarrow k = \frac{44}{4000} = 11 \cdot 10^{-3}$$

$$n = 0 \Rightarrow V_{Amin} = 6 \text{ V}$$



$$V_A = D_{14} \cdot 50 - (1 - D_{14}) 50$$

$$V_{Amin} = 6 = (2D_{14} - 1) 50$$

$$D_{14+} = \frac{\frac{6}{50} + 1}{2} = 56\%$$

$$-6 = (2D_{14} - 1) \cdot 50$$

$$D_{14-} = \frac{-\frac{6}{50} + 1}{2} = 44\%$$