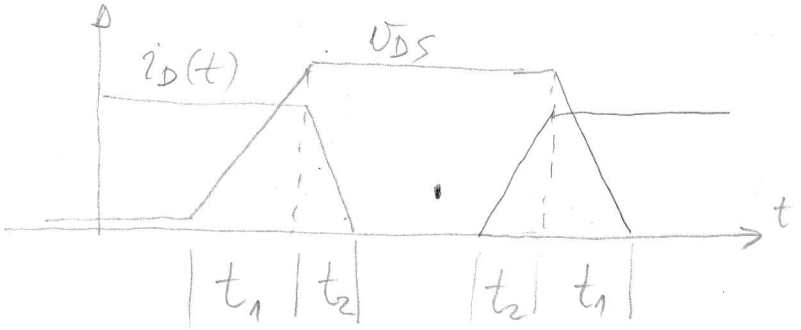
TE - 20180704

1



$$t_1 = \frac{500V}{2500\,V/\mu s} = 200ns.$$

$$t_2 = \frac{20A}{200\,A/\mu s} = 100ns$$

$W_1 = \frac{1}{2} t_1 \cdot 20A \cdot 500V = 100\mu J$;

$W_2 = \frac{1}{2} t_2 \cdot 20A \cdot 500V = 50\mu J$;

$W = 2W_1 + 2W_2 = 300\mu J$

$P = W \cdot f = 300 \cdot 10^{-6} \cdot 40 \cdot 10^3 = 12W$

2

$V_p I_p = U_B \cdot I_B \Rightarrow I_B = \frac{V_p I_p}{U_B} = \frac{20 \cdot 7}{28} = 5A$

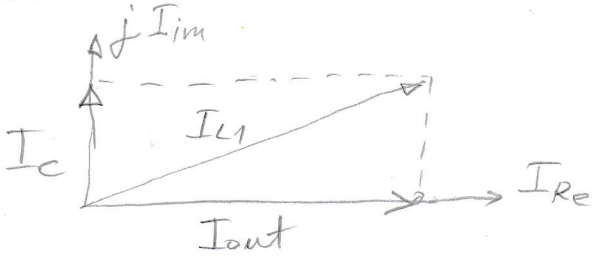
$\frac{U_B}{V_p} = \frac{D}{1-D} \Rightarrow U_B(1-D) = V_p D \Rightarrow U_B = (V_p + U_B) D \Rightarrow D = \frac{U_B}{V_p + U_B} = \frac{28}{20+28} = 58{,}3\%$

$V_T = V_p + U_B = 48V$; $\hat{I}_T = \frac{1}{D} I_p = \frac{7}{0{,}583} = 12A$

$k = \frac{P_0}{V_T \cdot I_T} = \frac{5 \cdot 28}{48 \cdot 12} = 0{,}243$

3

$\hat{I}_c = \frac{I_c}{\sqrt{2}} = \frac{3}{\sqrt{2}} = 2{,}12A$



$I_{L1} = \sqrt{I_{out}^2 + I_c^2} = 10{,}22A$

$\hat{I}_{L1} = \sqrt{2} \cdot I_{L1} = 14{,}46A$

$\hat{I}_Q = \hat{I}_{L1}$
