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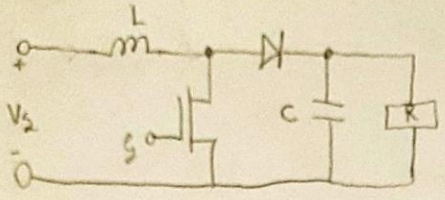
①



$V_s = 100 + 3\cos(377t) \Rightarrow V_{med} = 100V$

$R = 2\Omega$ $L = 1{,}3mH$ $C = 1{,}25mF$ ripple: de -3 a 3 $\Rightarrow \Delta V_s = 6V$

$f = 25kHz$

$K = 0.5$

a) $V_a = \frac{V_{med}}{1-K} = \frac{100}{1-0.5} = \frac{100}{0.5} = 200V$

b) O ripple de entrada vem de $3\cos(377t)$ cujo valor varia de -3 a 3, realizando:

ripple de entrada: $\Delta V_s = 6V$

$$\Delta V'_a = \frac{I_a K}{f C} = \frac{100 \times 0.5}{25k \times 1{,}25m} = 1{,}6V$$

Ao comparar $\Delta V'_a$ e ΔV_s, percebe-se que o ripple de saída será influenciado apenas por ΔV_s, assim:

$$\Delta V_a = \frac{\Delta V_s}{0.5} = 12V$$

⑤ $V_B = 400V$ | $P_{CV} = 10\ CV$ | $V_m = 200V$

1- conversor buck //

2- $P_o = 735,5 \times P_{CV}$

$P_o = 7355\ W$

Considerando um sistema ideal

$I_B = \frac{P_o}{V_B} = 18,39\ A$ //

3 - ripple max = 10%, considerando uma frequência de 25kHz

$K = \frac{V_m}{V_B} = 0.5$, $\Delta I = 10\% \frac{P_o}{V_m} = 3.68$, $\Delta V = 10\% V_m = 20$

$L = \frac{K V_B (1-K)}{f \Delta I} = 1,09\ mH$ //

$C = \frac{K V_B (1-K)}{8 f^2 L \Delta V} = 0.92\ \mu F$

② $V_s = 127\ rms$

$P_o = 250W$

$V_o = 12V$

$ripple_{max} = 1\%$

ideal $f = 20kHz$

i) $C = \frac{P_{in}}{f(V_{rect_{max}}^2 - V_{c_{min}}^2)} = \frac{250}{120\left((127\sqrt{2})^2 - (127\sqrt{2}\cdot 0.995)^2\right)} \simeq 6,47\ mF$

$V_{rect\ max} = 127\sqrt{2}$

$V_{c_{min}} = 127\sqrt{2} \times 0.995$

$K = \frac{V_o}{V_{rect_{max}}} = 0,07$, $\Delta I = 1\% \frac{250}{12} \simeq 0,208$ $\Delta V = 1\% V_o = 0,12V$

$L = \frac{K V_{rect\ max}(1-K)}{f\ \Delta I} = 2.81\ mH$ $C = \frac{K V_{rect_{max}}(1-K)}{8 f^2 L \Delta V} = 10,83\ \mu F$