CC/CC E4

14/1/2021
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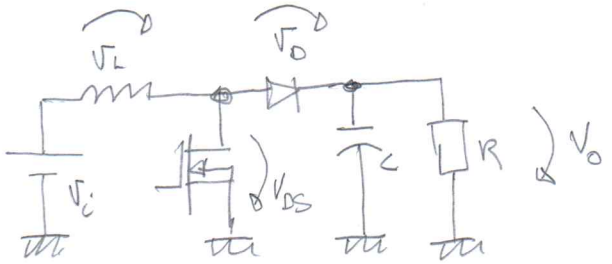
Exercício 4



$V_i = 48\ V$

$f = 10\ Khz$

$\langle V_o \rangle = 60\ V$

$\Delta V = 0{,}6\ V$

$R = 100\ \Omega$

a) $D = 1 - \frac{V_i}{\langle V_o \rangle}$

$= 0{,}2$

formulário

$\langle V_o \rangle = \frac{V_i}{1-D} \Rightarrow D = 1 - \frac{V_i}{\langle V_o \rangle}$

$i_L = \frac{\langle V_o \rangle}{R(1-D)}$; $\Delta i_L = \frac{V_i}{L} \cdot D T$

$\Delta V_c = \frac{\langle V_o \rangle D T}{RC}$; $C_{min} = \frac{\langle V_o \rangle D T}{\Delta V_o R}$

b) $L_{crit} = ?$

$L_{crit} = \frac{(1-D)^2 D \cdot R}{2f}$

$L_{crit} \geq \frac{(1-D)^2 D \cdot R}{2f}$

$= 0{,}00064$

$= 0{,}64\ mH$

c) $C_{min} = \frac{\langle V_o \rangle D T}{\Delta V R}$

$= \frac{60 \times 0{,}2 \times \frac{1}{10.10^3}}{0{,}6 \times 100} = 0{,}00002$

$= 20\ \mu F$

d) $\langle i_L \rangle = \frac{\langle V_o \rangle}{R(1-D)}$

$= 0{,}75\ A$

e) $\Delta i_L = \frac{V_i}{L} \cdot D \cdot T = \frac{48}{0{,}00064} \times 0{,}2 \cdot \frac{1}{10.10^3}$

$= \frac{3}{2} = 1{,}5\ [A]$