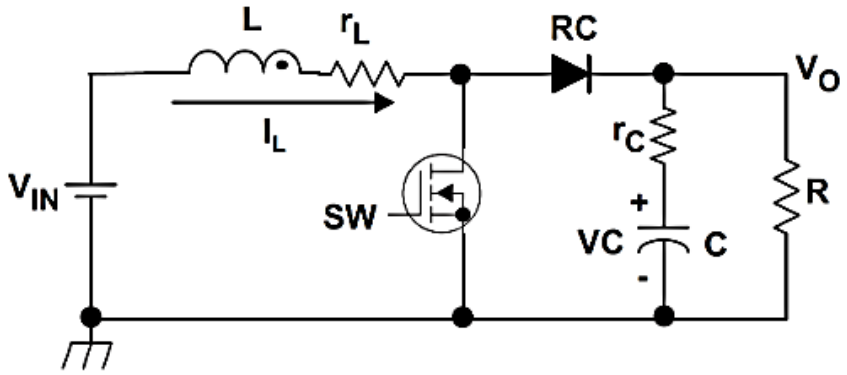

The values of the parameters are as follows:

* **Maximum Power (P_m), W:** 1 kW
* **Input Voltage (V_{IN}), V:** 240 V
* **Output Voltage (V_O), V:** 480 V
* **Switching Frequency (F_s), Hz:** 5 kHz

$D = 1 - \frac{V_{IN}}{V_O}$

$I_o = \frac{P_m}{V_O}$

$\Delta i = \%15 I_o \frac{V_O}{V_{IN}}$

$\Delta v = \%2 V_O$

* $r_c = r_L = 0.001\ \Omega$
* $L = \frac{V_{IN}(V_O - V_{IN})}{\Delta i F_s V_O}\ H$
* $C = \frac{I_o D}{\Delta v F_s}\ F$
* $R = \frac{V_O}{I_o}\ \Omega$

The transfer function of the system is as follows:

$$G_{dv} = \frac{\hat{v}_o}{\hat{d}} \cong G_{do} \cdot \frac{\left(1+\frac{s}{\omega_{Z1}}\right)\cdot\left(1-\frac{s}{\omega_{RHP-zero}}\right)}{1+\frac{s}{\omega_0 \cdot Q}+\frac{s^2}{\omega_0^2}}$$

Where

$$G_{do} \approx \frac{V_{IN}}{(1-D)^2} = \frac{V_o^2}{V_{IN}}$$

$$\omega_{Z1} = \frac{1}{r_C \cdot C}$$

$$\omega_{RHP-zero} \approx \frac{(1-D)^2 \cdot (R - r_L)}{L} \approx \frac{R}{L}\cdot\left(\frac{V_{IN}}{V_o}\right)^2 \quad \text{or} \quad \left(f_{RHP-zero} \approx \frac{R}{2\pi \cdot L}\left(\frac{V_{IN}}{V_o}\right)^2\right)$$

$$\omega_0 \approx \frac{1}{\sqrt{L \cdot C}} \cdot \sqrt{\frac{r_L + (1-D)^2 \cdot R}{R}} \approx \frac{1}{\sqrt{L \cdot C}} \cdot \frac{V_{IN}}{V_o} \quad \text{or} \quad \left(f_O \approx \frac{1}{2\pi\sqrt{LC}} \cdot \frac{V_{IN}}{V_o}\right)$$

$$Q \approx \frac{\omega_0}{\frac{r_L}{L} + \frac{1}{C \times (R + r_c)}}$$