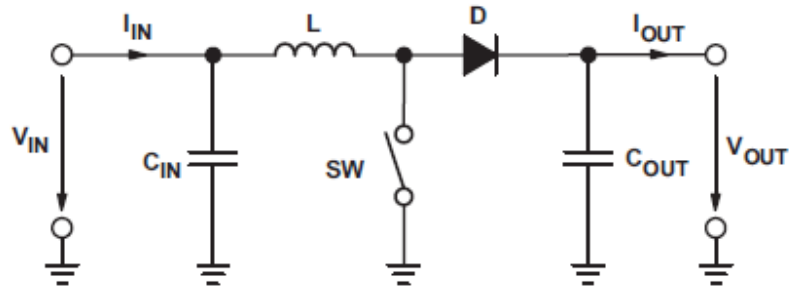# Fuente DC-DC elevadora + auxiliar

(Step up o boost converter)

Cálculo considerando un inductor conocido:

$$D = 1 - \frac{V_{in(min)}}{V_{out}}\, \eta$$

$$\Delta I_L = \frac{V_{in(min)\, D}}{f_s\, L}$$

$$I_{\text{Max out}} = \left(I_{LIM(min)} - \frac{\Delta I_L}{2}\right)(1 - D)$$

$$I_{SW} = \frac{\Delta I_L}{2} + \frac{I_{\text{Max out}}}{1 - D}$$

Cálculo del inductor:

$$\Delta I_L = (0,2 \; a \; 0{,}4)\, I_{\text{Max out}}\, \frac{V_{out}}{V_{in}}$$

$$L = \frac{V_{in}\,(V_{out} - V_{in})}{\Delta I_L\, f_s\, V_{out}}$$

Selección del diodo:

$$I_F = I_{\text{Max out}}$$

$$P_D = I_F\, V_F$$

Selección de la capacidad de salida:

$$C_{out(min)} = \frac{I_{\text{Max out}}\, D}{f_s\, \Delta V_{out}}$$

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Cálculo del charge pump:

$$2\,V_\text{out} = V_{sw} + V_{c4} - V_{D4} - 2\,I_{Max\,out}(ESR_{c5} + r_{D4} + R_5)$$

$$C = \frac{I_{Max\,out}\,D}{f_s\,\Delta V_\text{out}} + (I_{Max\,out}\,ESR_{cap})$$