

For buck converter

$$D = \frac{V_o}{V_{in}}$$

$$I_{avg} = \frac{(I_{max} + I_{min})}{2} = \frac{V_o}{R}$$

$$I_{max} = V_o \left(\frac{1}{R} + \frac{1-D}{2 * L * f} \right)$$

$$I_{min} = V_o \left(\frac{1}{R} - \frac{1-D}{2 * L * f} \right)$$

$$I_{D(avg)} = I_{L(avg)} * (1 - D)$$

For boost converter

$$\frac{V_o}{V_{in}} = \frac{1}{1-D}$$

$$I_{min} = \left(\frac{V_{in}}{(1-D)^2 * R} \right) - \left(\frac{V_{in}}{2 * L} DT \right)$$

$$I_{max} = \left(\frac{V_{in}}{(1-D)^2 * R} \right) + \left(\frac{V_{in}}{2 * L} DT \right)$$

$$I_{avg} = \frac{(I_{max} + I_{min})}{2} = \left(\frac{V_{in}}{(1-D)^2 * R} \right)$$