for Boost Converter, We know that

$$\text{Duty} = \frac{\text{Vout} - \text{Vin}}{\text{Vout}}$$

if output current is Iout, we could get the coil average current

$$\text{Iaverage} = \frac{\int_0^T \text{Iout}\,dt}{T - DT} = \frac{\text{Iout}\cdot T}{T - DT} = \frac{\text{Iout}}{1 - D}$$

and we also could get the following equation

$$\frac{1}{2}\cdot \text{Lp}\cdot \text{Ipeak}^2\cdot\frac{1}{\text{Tcycle}} = \text{Vout}\cdot\text{Iout}$$

$$\text{Ipeak} = \frac{\text{Vin}}{\text{Lp}}\cdot\text{Duty}\cdot\text{Tcycle}$$

so

$$\frac{1}{2}\cdot \text{Lp}\cdot\left(\frac{\text{Vin}}{\text{Lp}}\cdot\text{Duty}\cdot\text{Tcycle}\right)^2\cdot\frac{1}{\text{Tcycle}} + \frac{\text{Vin}}{\text{Lp}}\cdot\text{Duty}\cdot\text{Tcycle}\cdot\frac{1}{2}\cdot\text{Vin}\cdot(1 - \text{Duty}) = \text{Vout}\cdot\text{Iout}\ \text{solve},\text{Iout}\ \rightarrow \frac{1}{2}\cdot\frac{\text{Vin}^2}{\text{Lp}}\cdot\text{Duty}\cdot\frac{\text{Tcycle}}{\text{Vout}}$$

$$\text{Iout} = \frac{1}{2}\cdot\frac{\text{Vin}^2}{\text{Lp}}\cdot\text{Duty}\cdot\frac{\text{Tcycle}}{\text{Vout}} = \frac{1}{2}\cdot\frac{\text{Vin}}{\text{Lp}}\cdot\text{Duty}\cdot\text{Tcycle}\cdot\frac{\text{Vin}}{\text{Vout}} = \frac{\text{Iaverage}}{1 - D}$$

using the following equation, we could get the same result in the CCM

$$Iaverage = Vout \cdot \frac{Iout}{Vin} = \frac{Iout}{1 - D}$$