



Square-wave inverter: $V_{01} = 220\text{V}$, $f = 47\text{ Hz}$, $L = 100\text{ mH}$

$$V_d = \frac{\pi}{4}(\sqrt{2} V_{01}) = 1.11 V_{01} = 244.2\text{V} \quad (\text{From Eq 8-36})$$

$$\hat{V}_{01} = \sqrt{2} \times 220 = 311.13\text{ V}$$

$$\omega = 2\pi \times 47 = 295.3\text{ rad/s}$$

$$\frac{T}{4} = \frac{1}{4 \times 47} = 0.00532\text{ s}$$

$$i_{\text{ripple}} = \frac{1}{L} \int v_{\text{ripple}} \cdot dt = \frac{1}{L} \int (V_d - v_{01}) \cdot dt$$

$$I_{\text{ripple, peak}} = \frac{1}{L} \int_0^{T/4} (V_d - 311.3 \cdot \cos 295.3t) \cdot dt$$

$$= 10 \left[(244.2) \frac{T}{4} - \frac{311.3}{295.3} \right] = 2.45\text{A}$$

[Note that in the figure above at $t=0$, $i_{\text{ripple}} = 0$]