

BWW Uppg 8.7

Antag att C_s väljs enligt

$$\bar{i}_{C_s} = C_s \frac{dV_{C_s}}{dt} \Rightarrow$$

$$C_s = \bar{i}_{C_s} \frac{dt}{dV_{C_s}} = I_0 \frac{t_{fr}}{V_{dc}}$$

Strömmen \bar{i}_c kan skrivas

$$\bar{i}_c = I_0 \left(1 - \frac{t}{t_{fr}}\right)$$

vilket ger strömmen \bar{i}_{C_s}

$$\bar{i}_{C_s} = I_0 - \bar{i}_c = I_0 - I_0 \left(1 - \frac{t}{t_{fr}}\right) = I_0 \frac{t}{t_{fr}}$$

$$V_{C_s}(t_{fr}) - V_{C_s}(0) = \frac{1}{C_s} \int_0^{t_{fr}} I_0 \frac{t}{t_{fr}} dt =$$

$$= \frac{1}{C_s} \left[\frac{I_0 t^2}{2 t_{fr}} \right]_0^{t_{fr}} = \frac{1}{C_s} \left(\frac{I_0 t_{fr}}{2} \right) = \left\{ C_s = I_0 \frac{t_{fr}}{V_{dc}} \right\} =$$

$$= \frac{V_{dc}}{I_0 t_{fr}} \frac{I_0 t_{fr}}{2} = \frac{V_{dc}}{2}$$