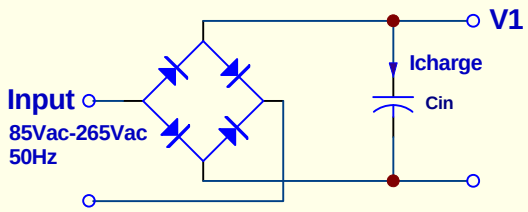
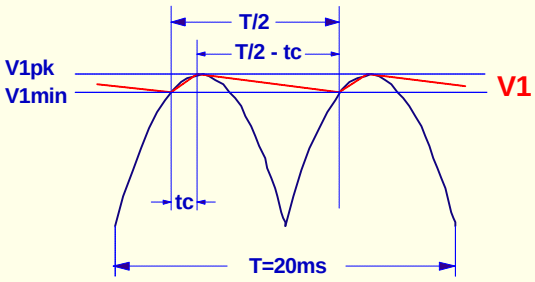
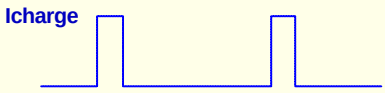
Full Wave Bridge Operation for Vinac = 85V - 265V

Appendix B







1. A rule of thumb for Cin selection:

$$2\cdot\frac{\text{mF}}{\text{W}} - 3\frac{\text{mF}}{\text{W}}$$

2. With $\text{Pin} := 75\cdot\text{W}$ **, Cin should be:**

$$\text{Cin} := 2\cdot\frac{\text{mF}}{\text{W}}\cdot\text{Pin}$$

$$\text{Cin} = 150\,\text{mF}$$

3. The discharge of Cin with the discharging time of $\frac{T}{2} - \text{tc}$ **provides all the energy required by the load:**

$$\text{Pin}\cdot\left(\frac{T}{2} - \text{tc}\right) := \frac{1}{2}\cdot\text{Cin}\cdot\left(\text{V1pk}^2 - \text{V1min}^2\right) \qquad (1)$$

T is the line switching period. With $\text{Fac} := 50\cdot\text{Hz}$, $T := 20\cdot10^{-3}\cdot\text{s}$

Charging time tc *of* Cin *is estimated as* $\text{tc} := 3\cdot10^{-3}\cdot\text{s}$

Minimun Peak input voltage at $\text{Vacmin} := 85\cdot\text{V}$ *is* $\text{V1pk} := \text{Vacmin}\cdot\sqrt{2}$, $\text{V1pk} = 120.208\,\text{V}$

4. Calculate V1min based on (1):

$$\text{V1min} := \sqrt{\text{V1pk}^2 - \frac{2\cdot\text{Pin}\cdot\left(\frac{T}{2} - \text{tc}\right)}{\text{Cin}}} \qquad (2)$$

$$\text{V1min} = 86.313\,\text{V}$$