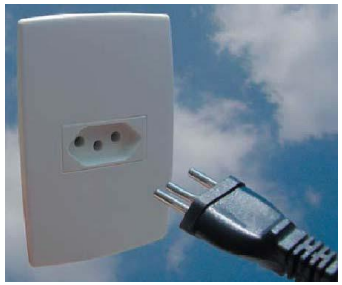
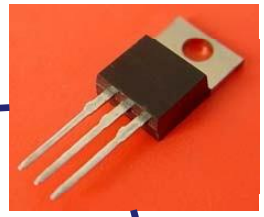
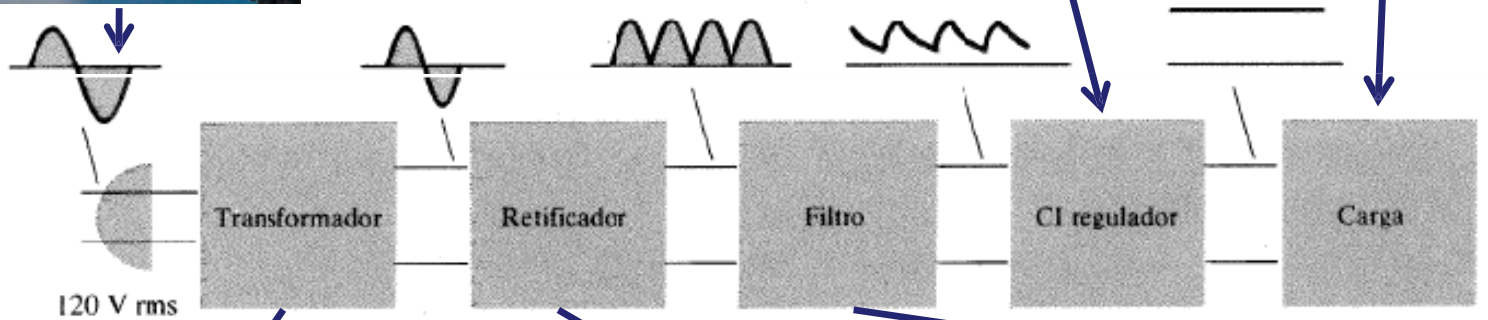
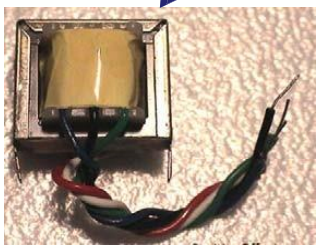
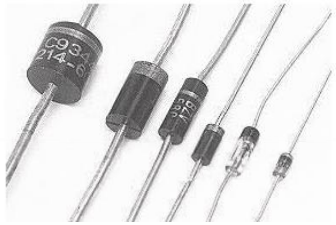
Fontes de Tensão

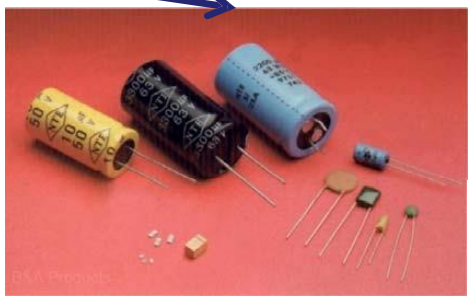










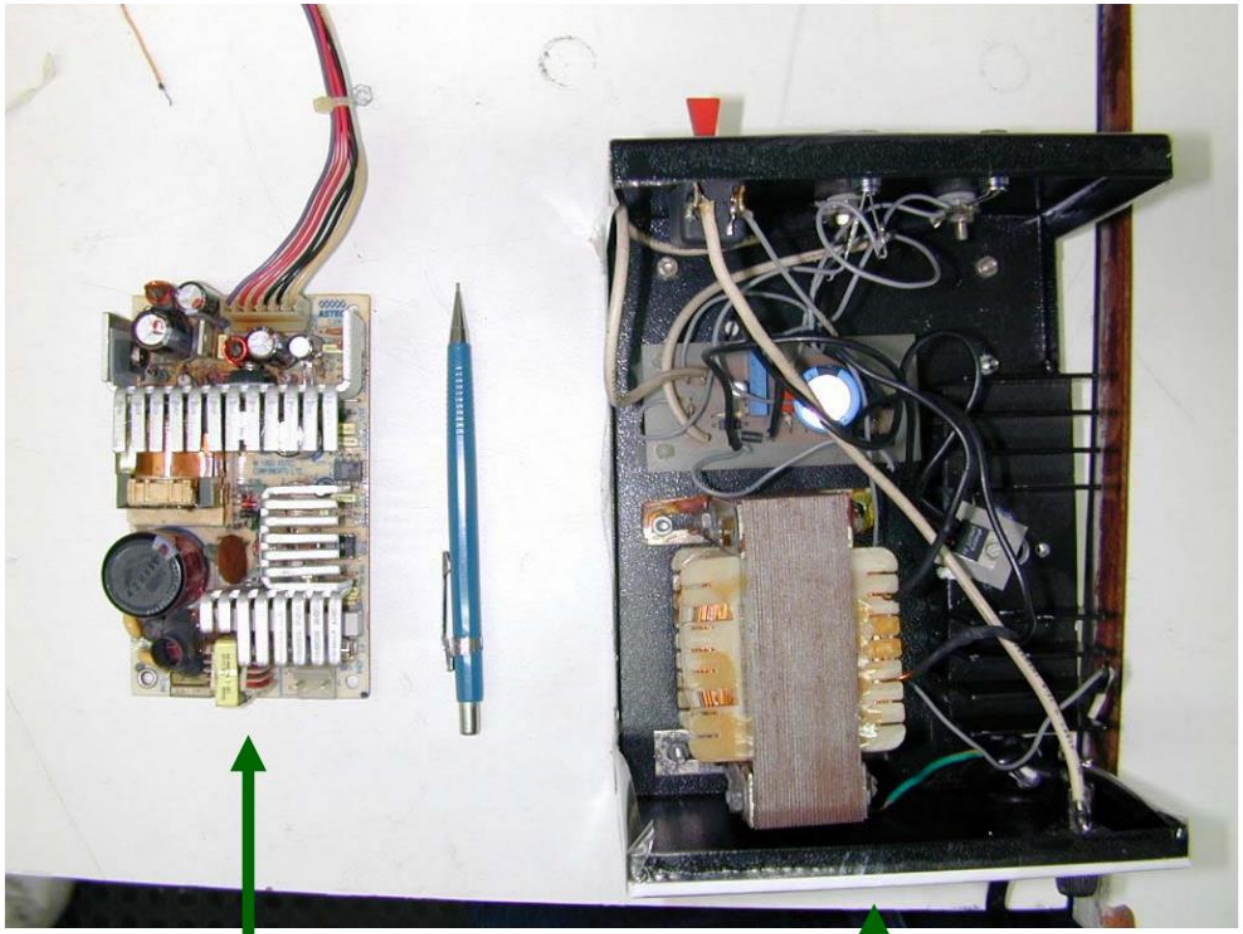


Fontes de Tensão

- Circuitos eletrônicos necessitam de alimentação
  - Circuitos valvulados;
  - Circuitos transistorizados;
  - Circuitos integrados, digitais, entre outros.

- Fonte Linear versus Fonte Chaveada
  - Eficiência energética;
  - Aplicação;
  - Custo;
  - Volume, peso;
  - Confiabilidade;
  - Facilidade de projeto.

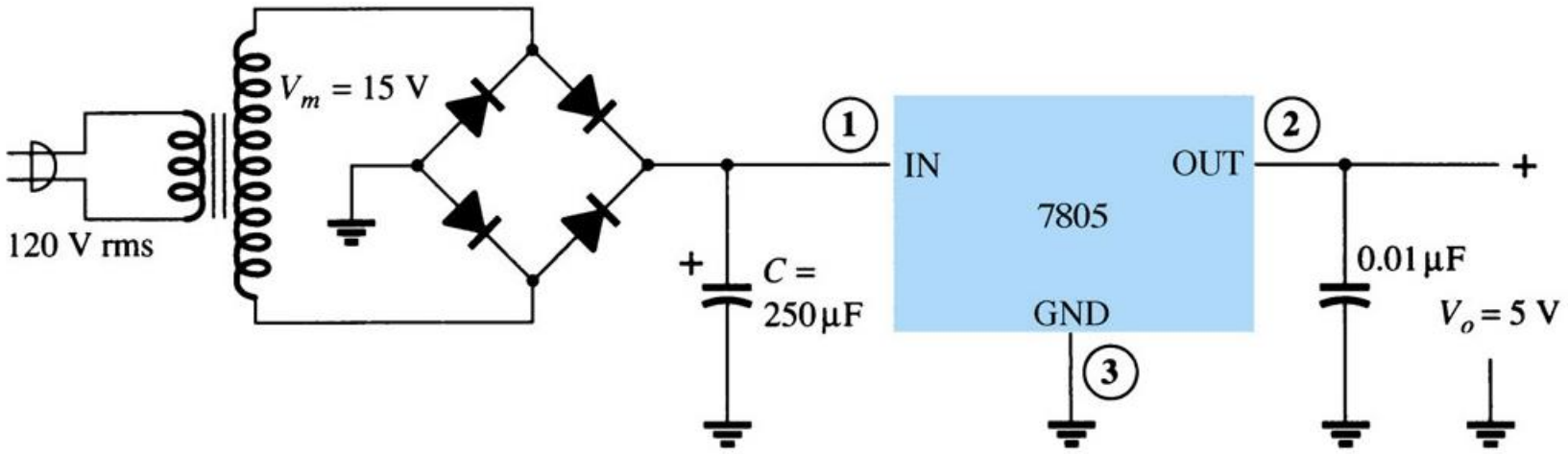
Fonte Linear versus Fonte Chaveada



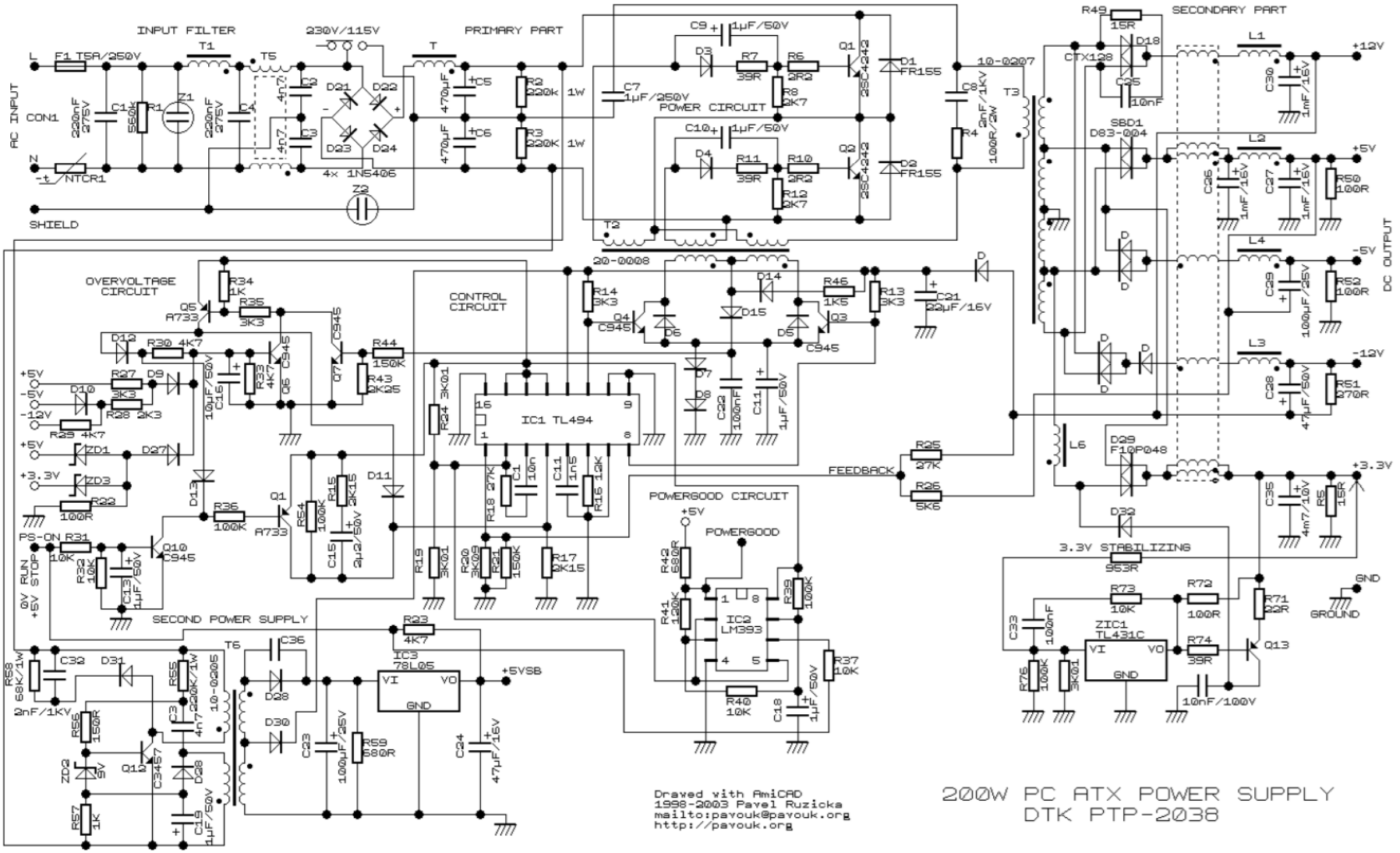
Fonte chaveada de 65 W

Fonte linear de 29 W

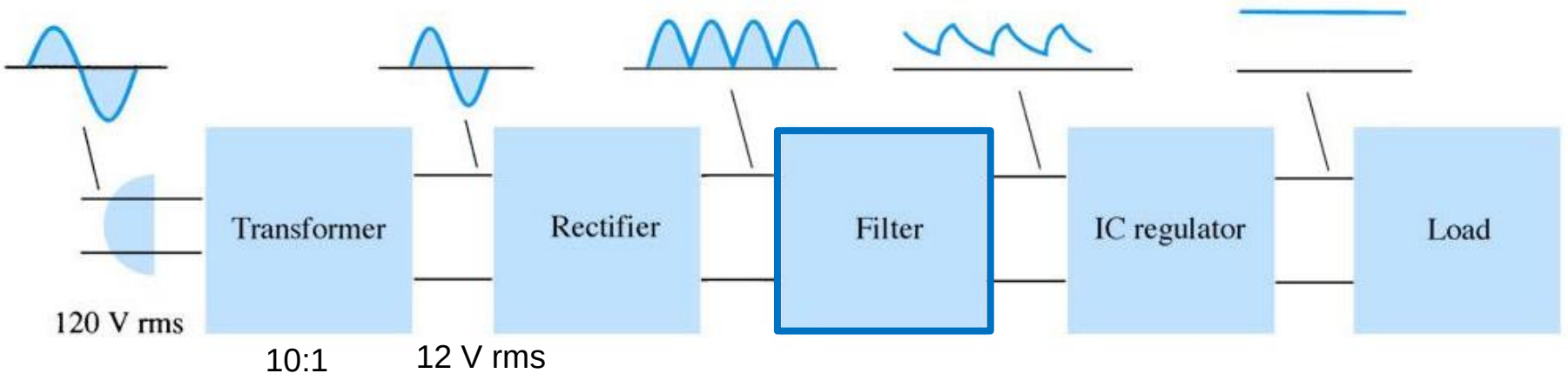
Fonte Linear versus Fonte Chaveada



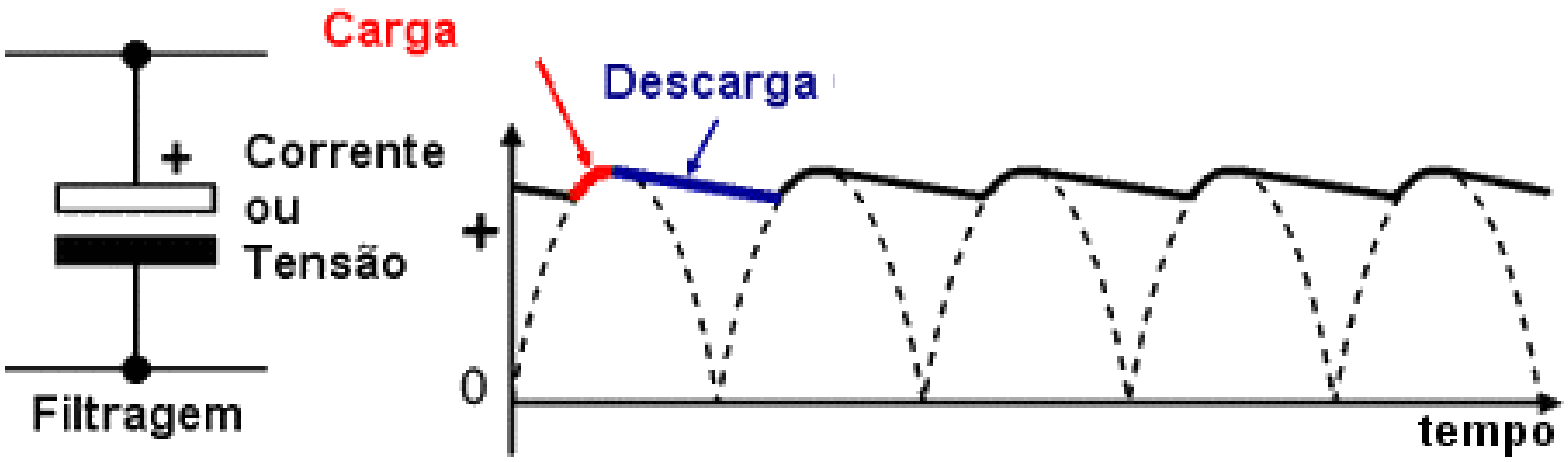
Fonte Linear versus **Fonte Chaveada**



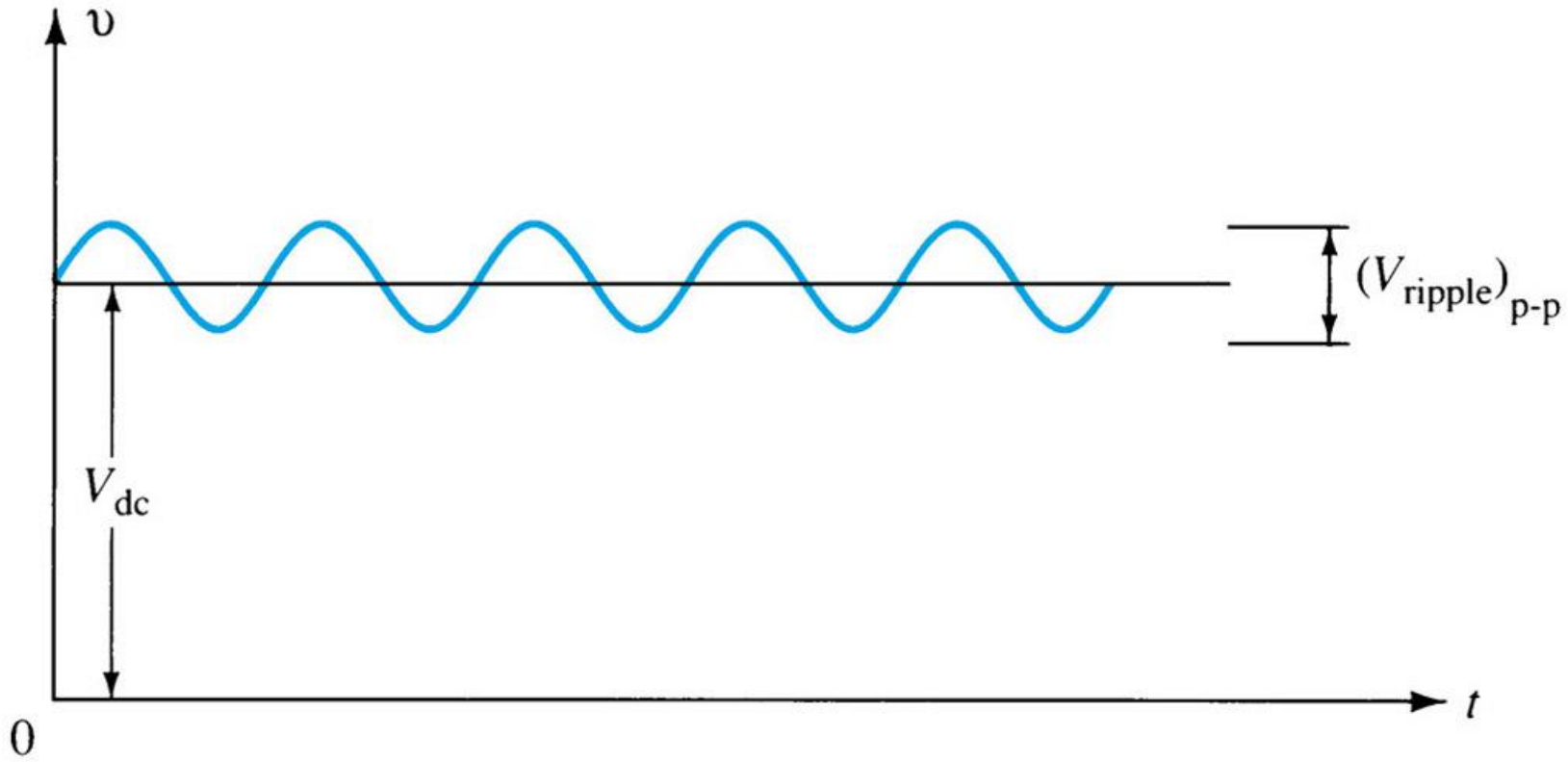
Fontes Lineares



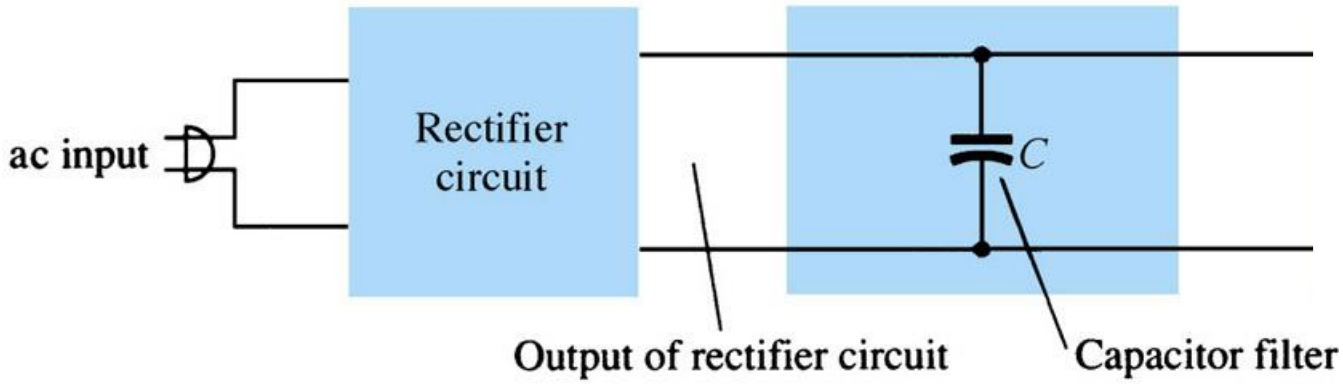
Filtros Capacitivos



Tensão de Ripple

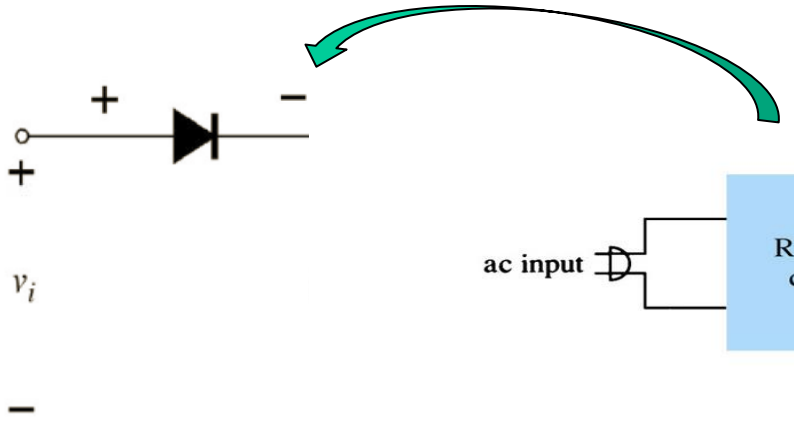


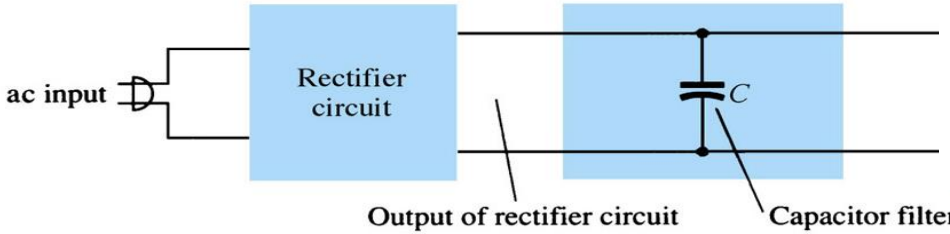
Filtros Capacitivos



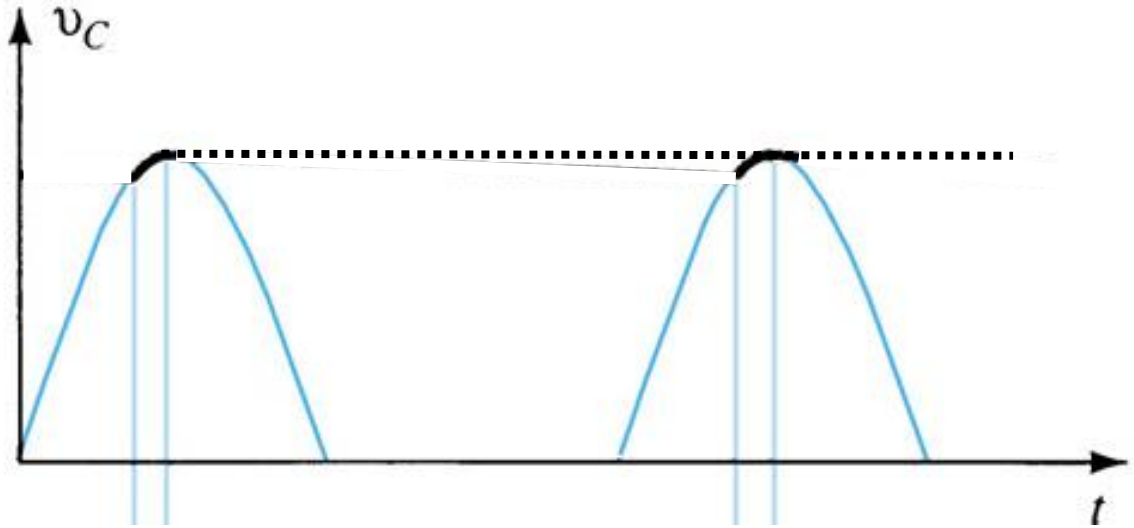
1. Sem Carga – $R_L = \infty$

Filtros Capacitivos

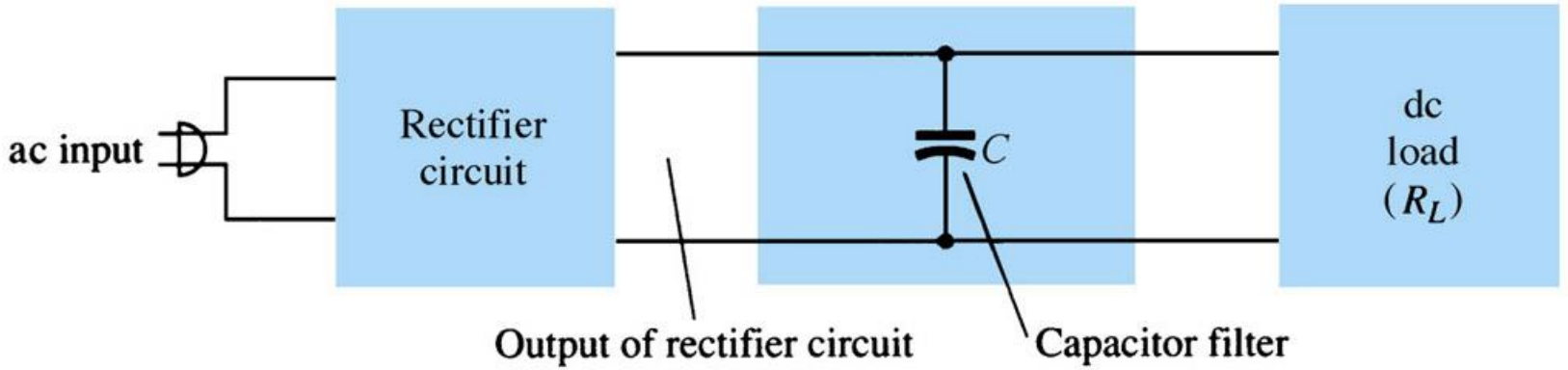




$R_L = \infty$



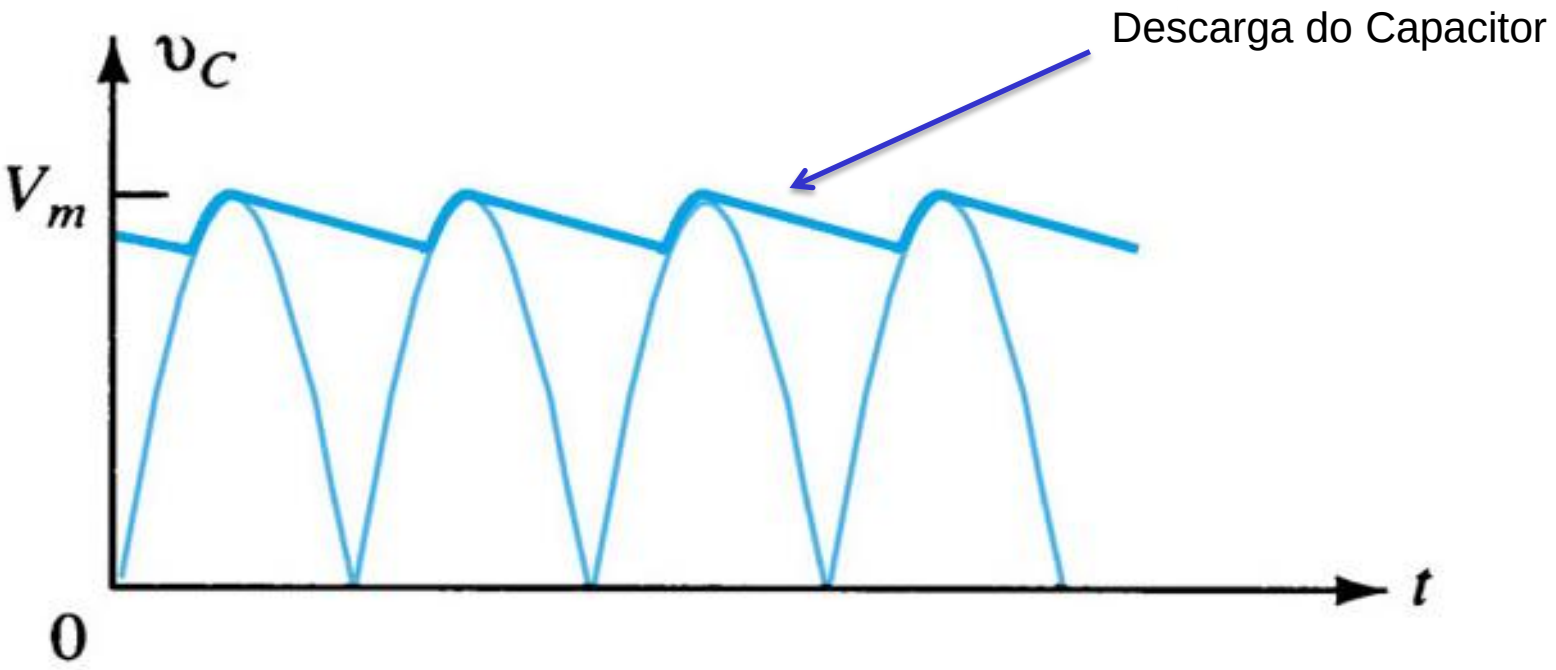
Filtros Capacitivos



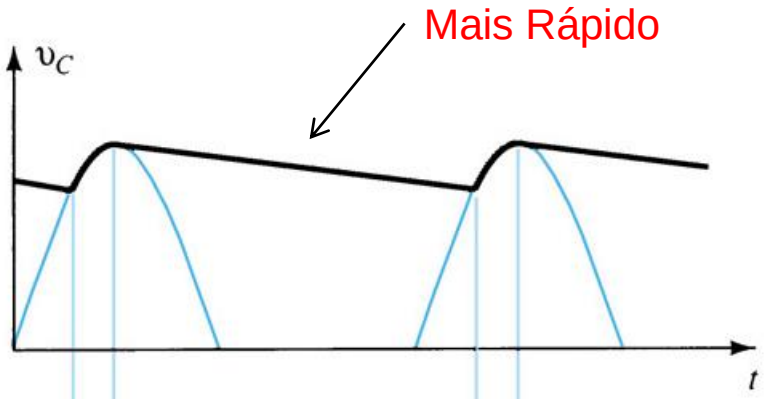
$R_L < \infty$

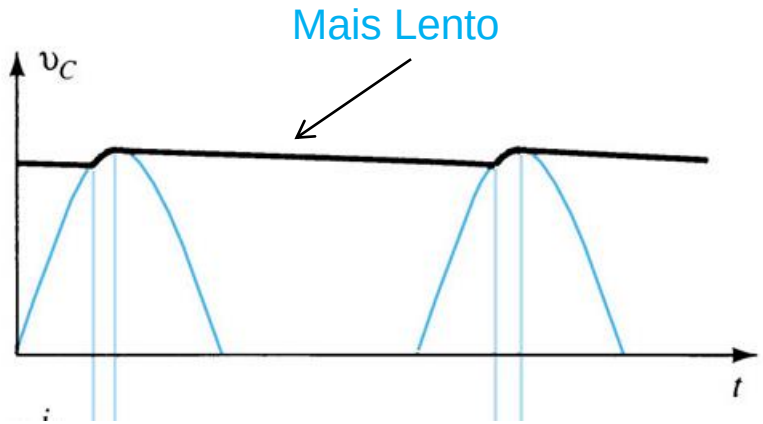
2. Com Carga – $R_L < \infty$

Filtros Capacitivos



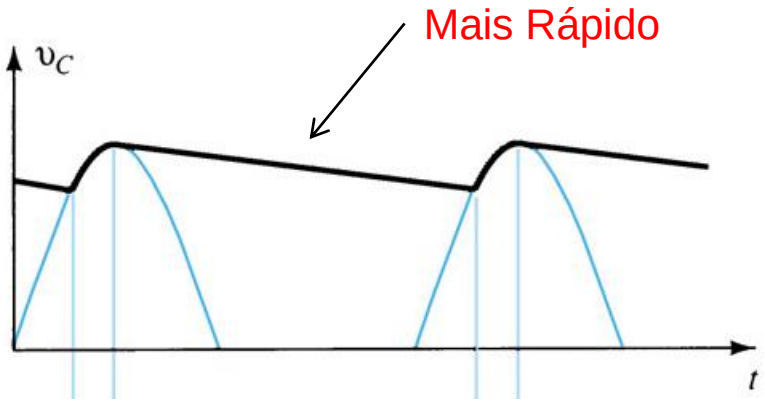
Descarga do Capacitor

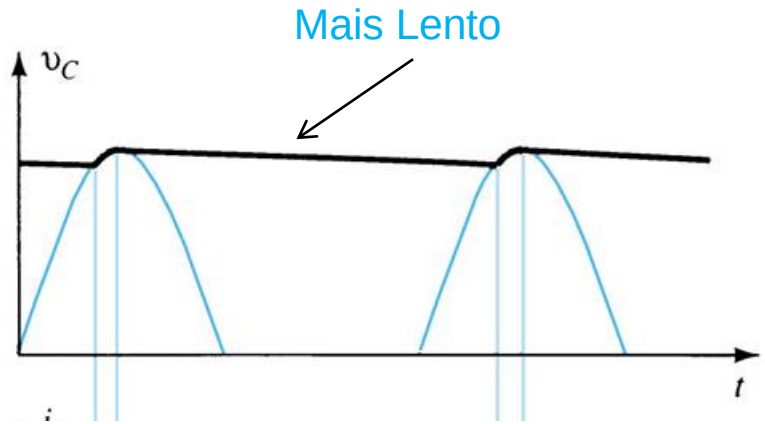




$$v_L = V_m e^{-\frac{t}{RC}} = V_m e^{-\frac{t}{\tau}}$$

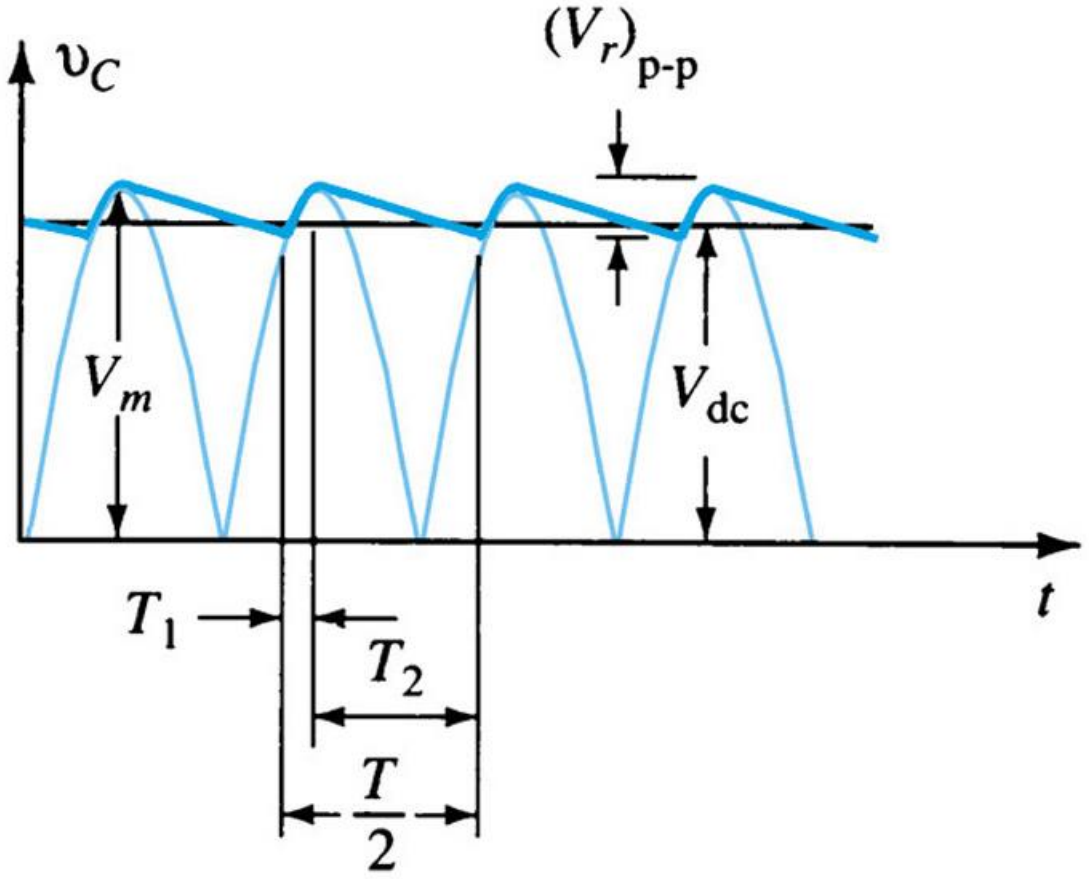
Descarga do Capacitor



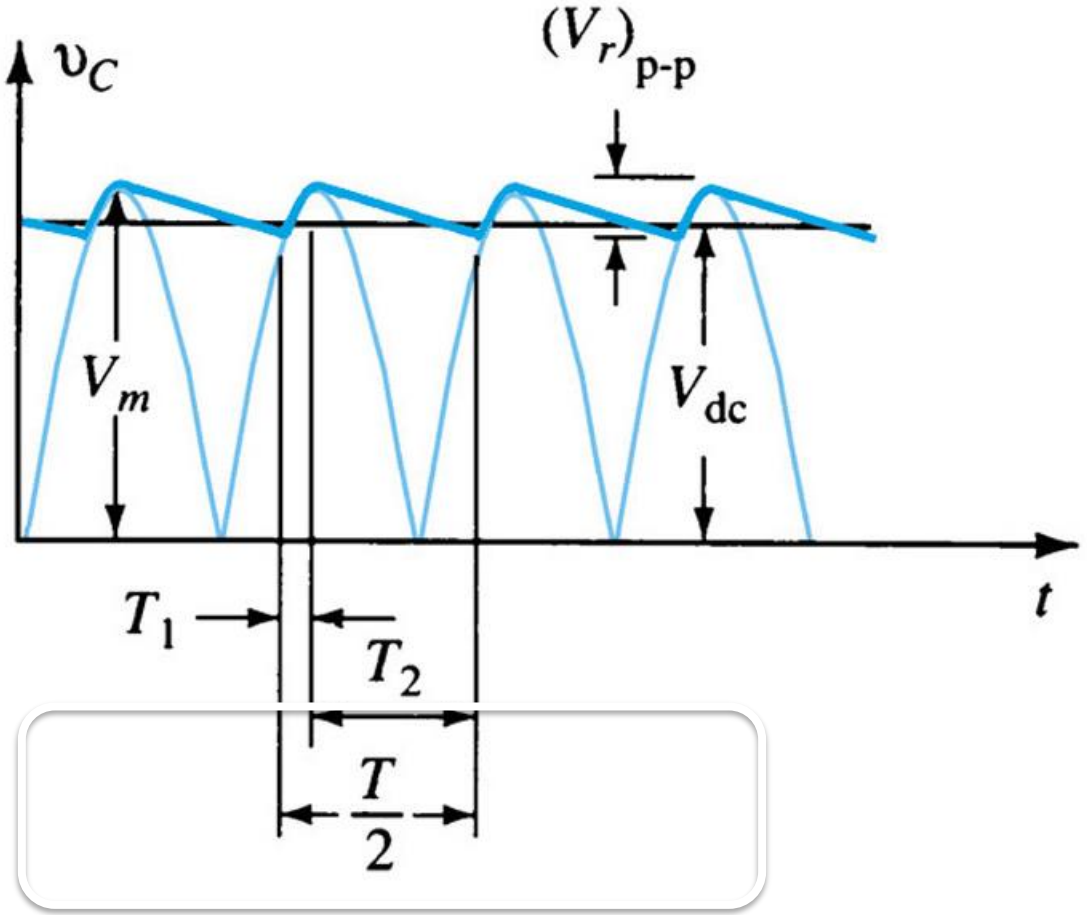


$$v_L = V_m e^{-\frac{t}{RC}} = V_m e^{-\frac{t}{\tau}} \cong \begin{cases} V_m e^{-\frac{T}{2RC}} \ (Onda\ Completa) \\ V_m e^{-\frac{T}{RC}} \quad (Meia\ Onda) \end{cases}$$

Ripple para Onda Completa

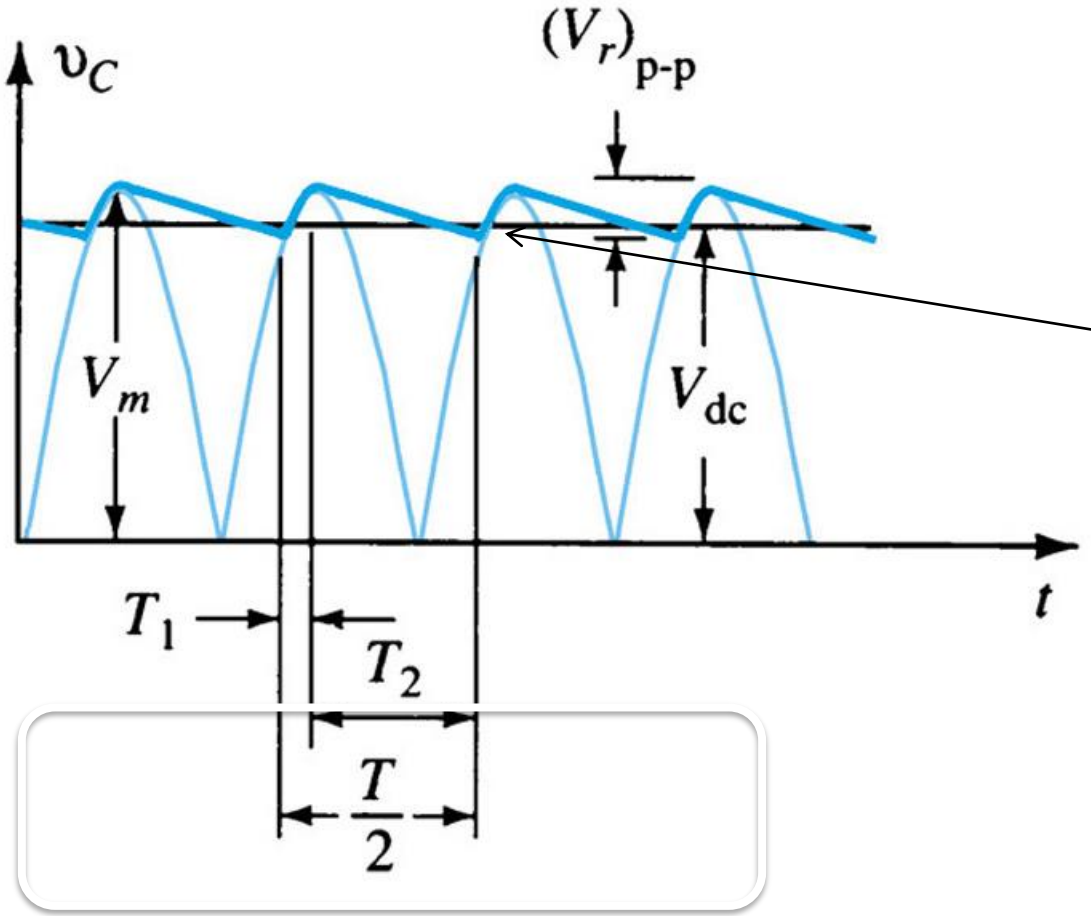


Ripple para Onda Completa



Se $T_2 \approx \frac{T}{2}$:

Ripple para Onda Completa



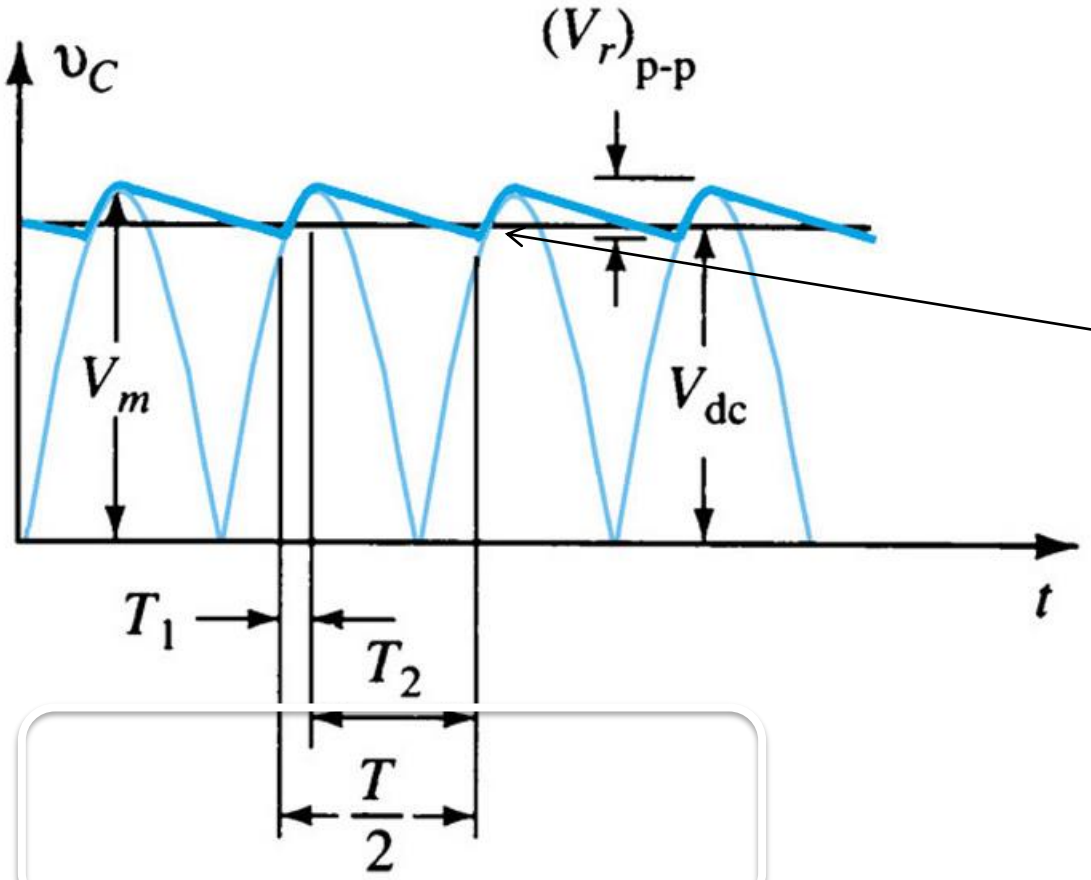
Se $T_2 \approx \frac{T}{2}$:

Descarga do Capacitor

$$v_L = V_m e^{-\frac{T}{2RC}}$$

$$v_L = V_m - V_r$$

Ripple para Onda Completa



Se $T_2 \approx \frac{T}{2}$:

Descarga do Capacitor

$$v_L = V_m e^{-\frac{T}{2RC}}$$

$$v_L = V_m - V_r$$

Aproximação:

$$V_m e^{-\frac{T}{2RC}} \approx V_m \left[1 - \frac{T}{2RC}\right]$$

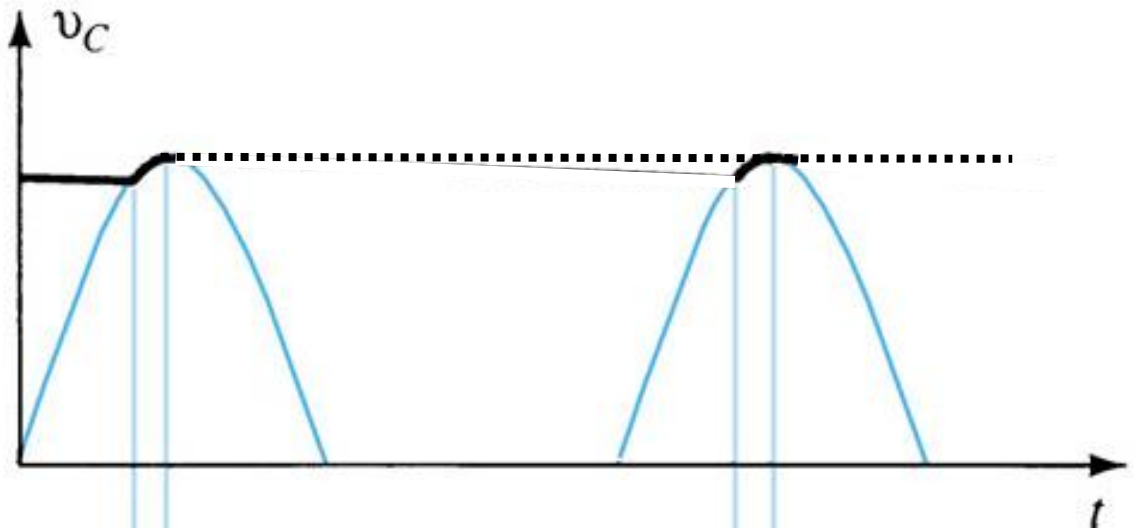
Ripple para Onda Completa

$$v_L = V_m - V_r$$

$$v_L = V_m e^{-\frac{T}{2RC}} \approx V_m \left[1 - \frac{T}{2RC}\right]$$

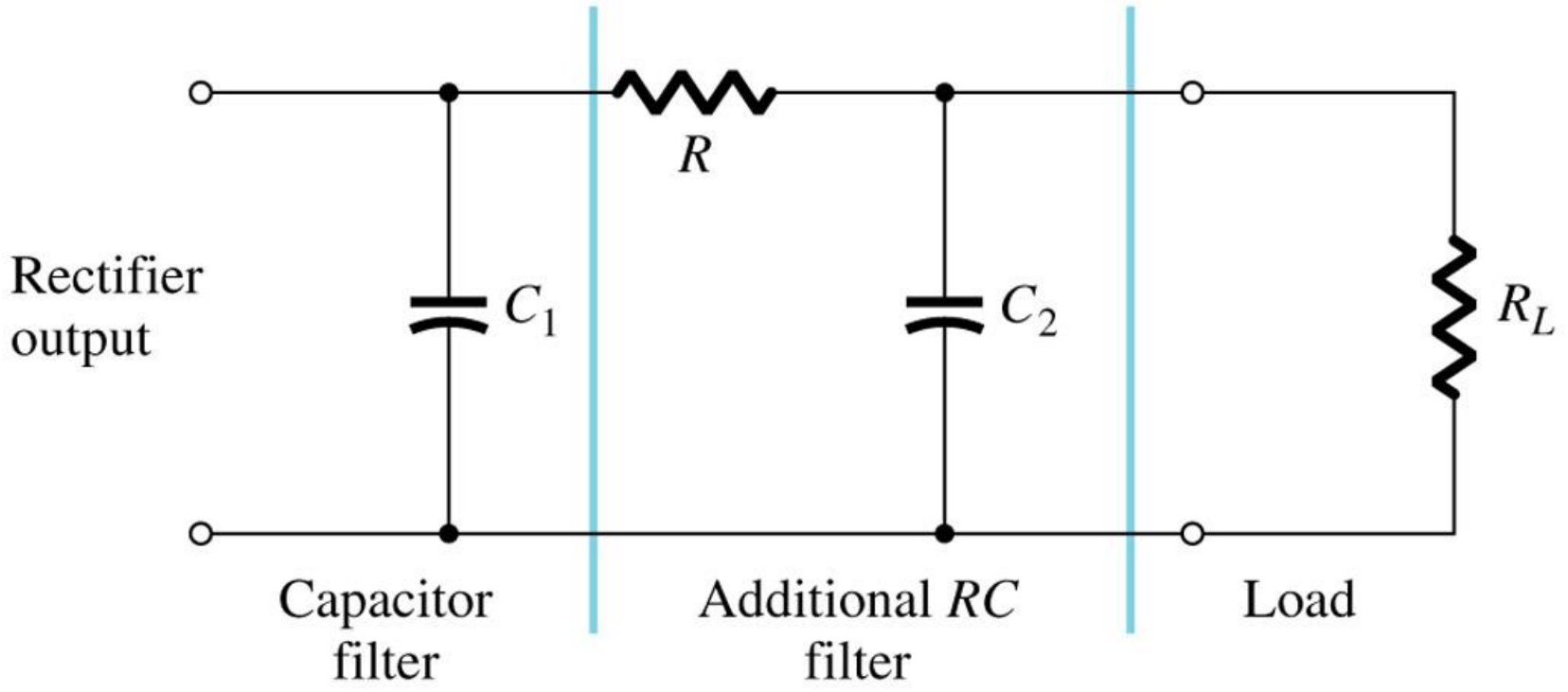
$$V_r = \frac{V_m T}{2RC} = \frac{V_m}{2fRC}$$

Ripple para Meia Onda

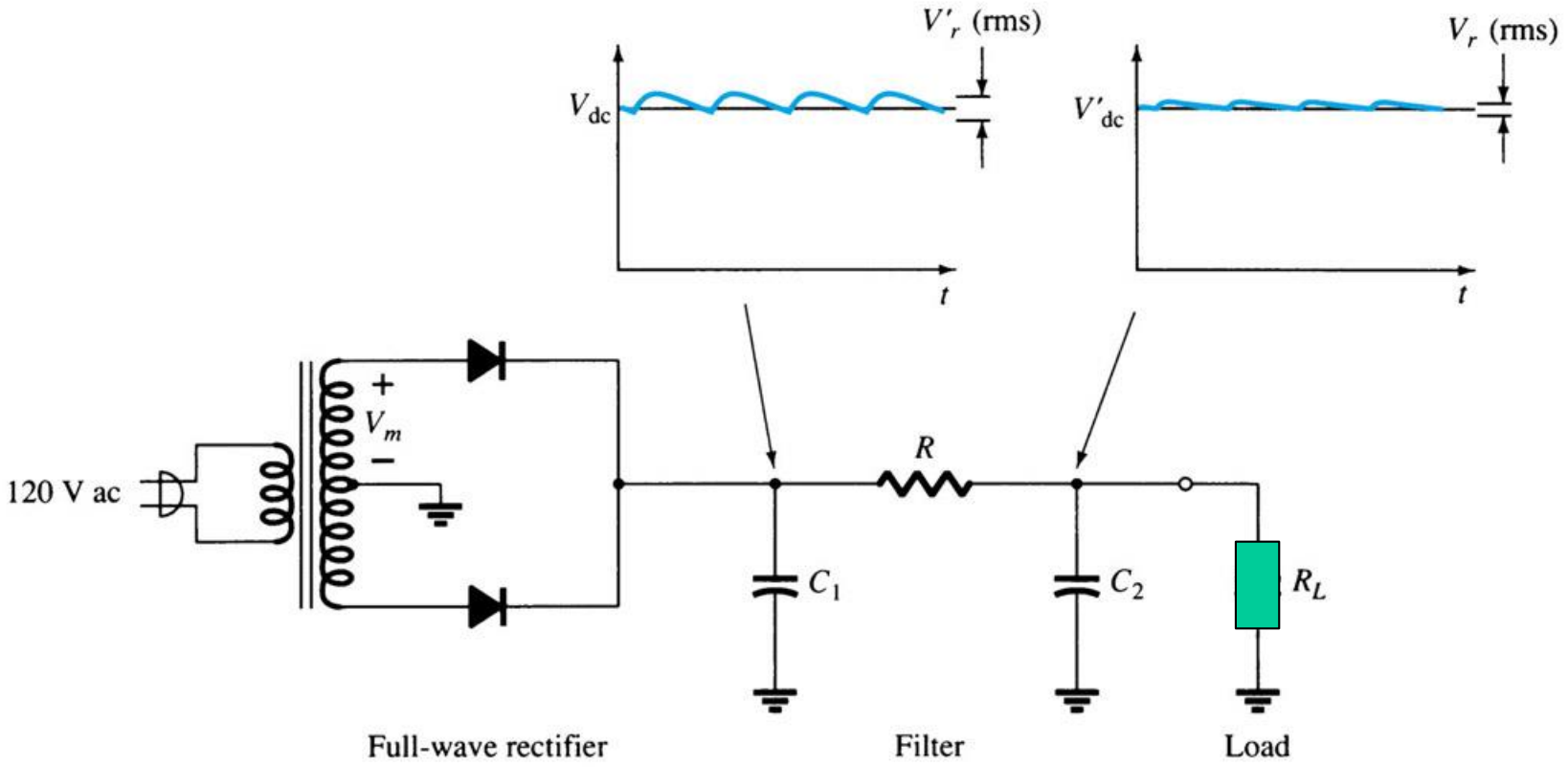


$$V_r = \frac{V_m T}{RC} = \frac{V_m}{fRC}$$

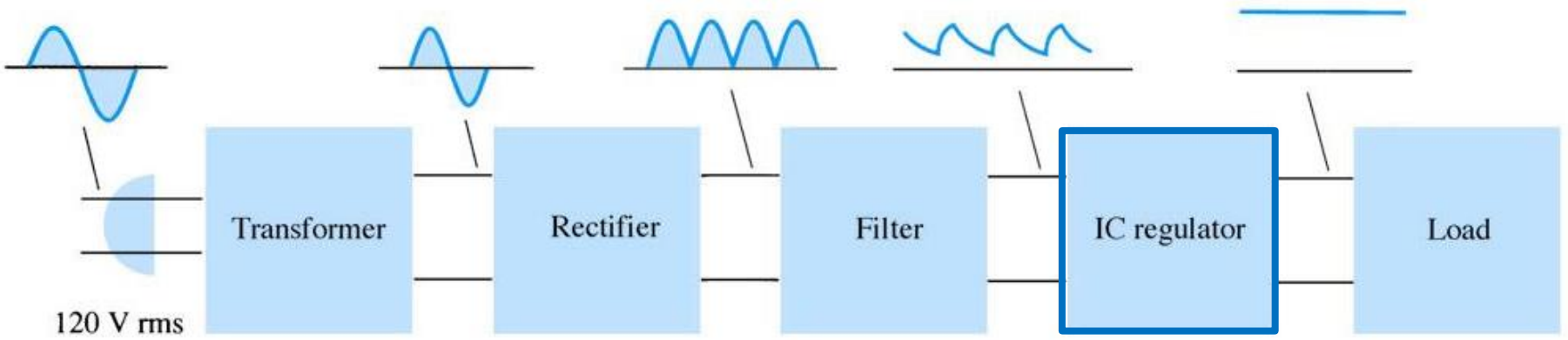
Filtros Capacitivos – Em cascata



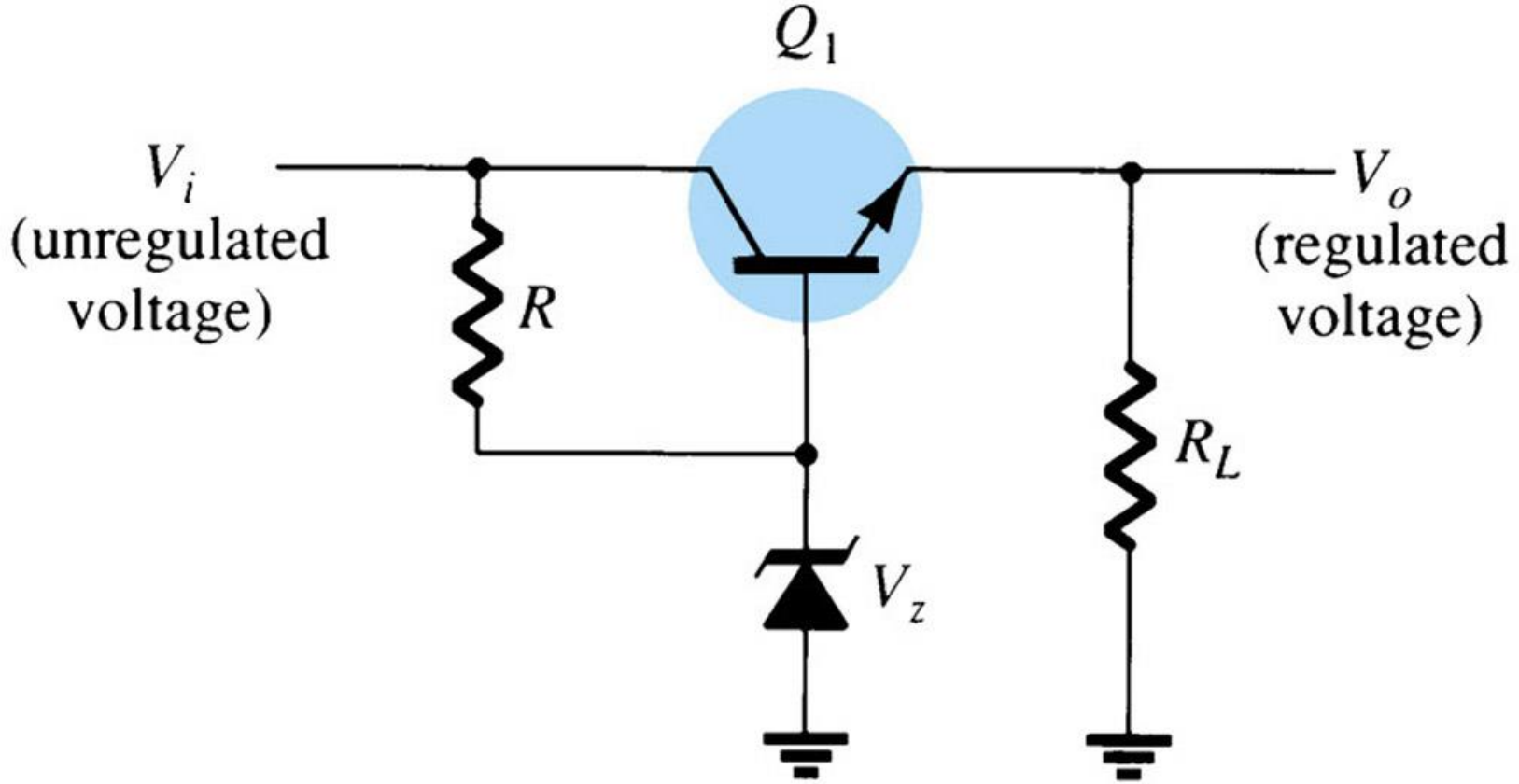
Filtros Capacitivos – Em cascata



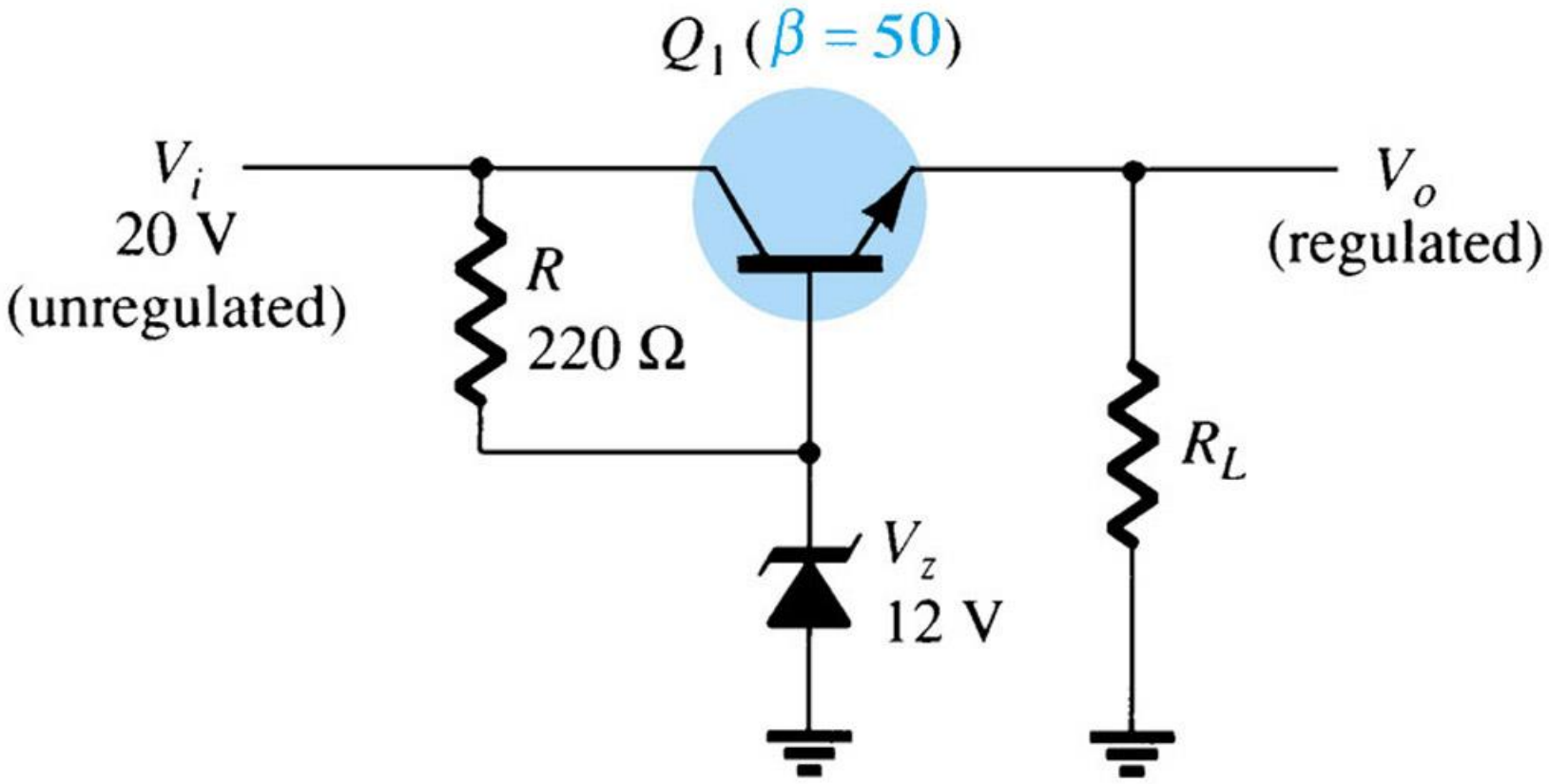
Fontes de Tensão



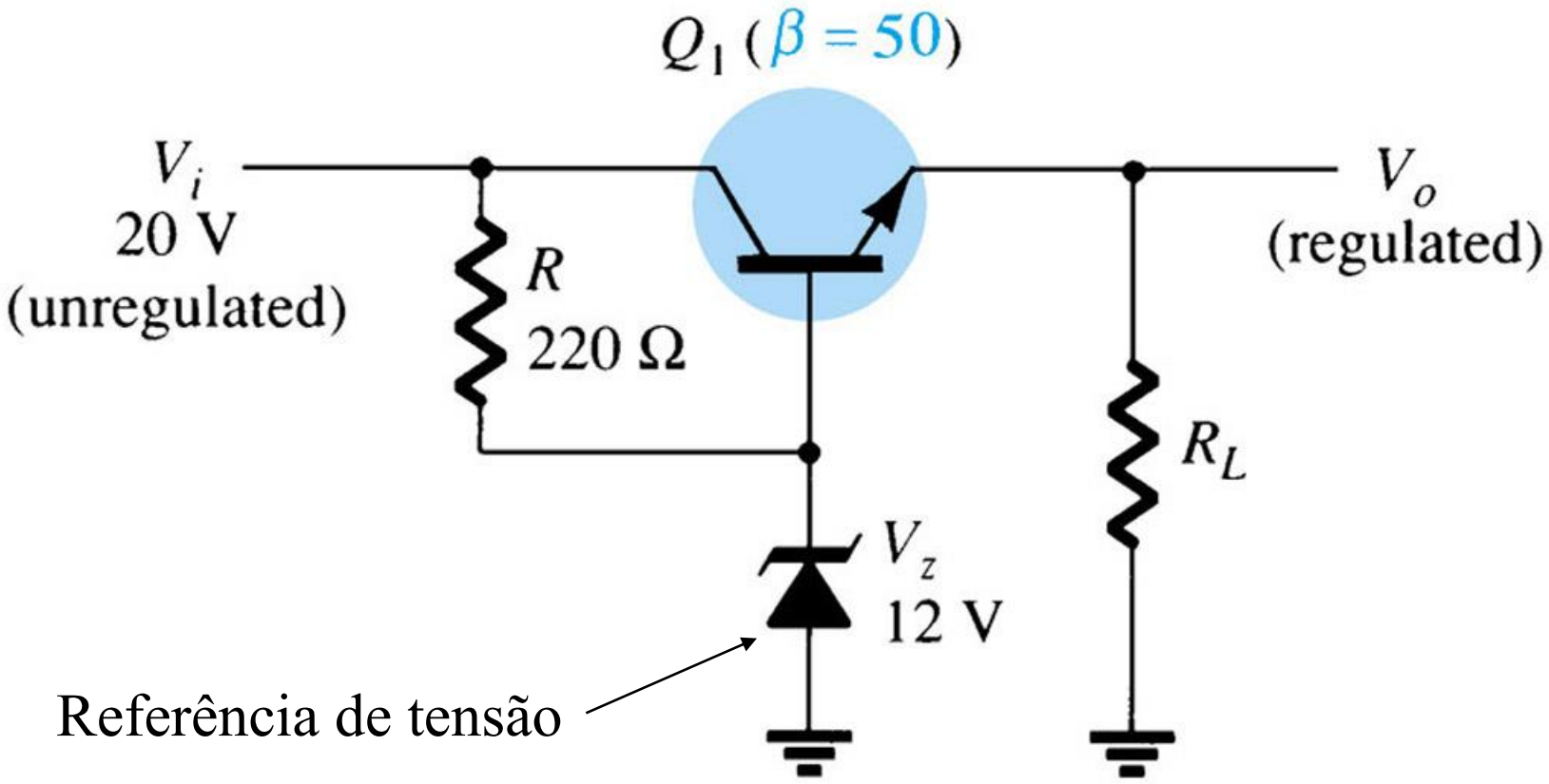
Fontes Reguladas



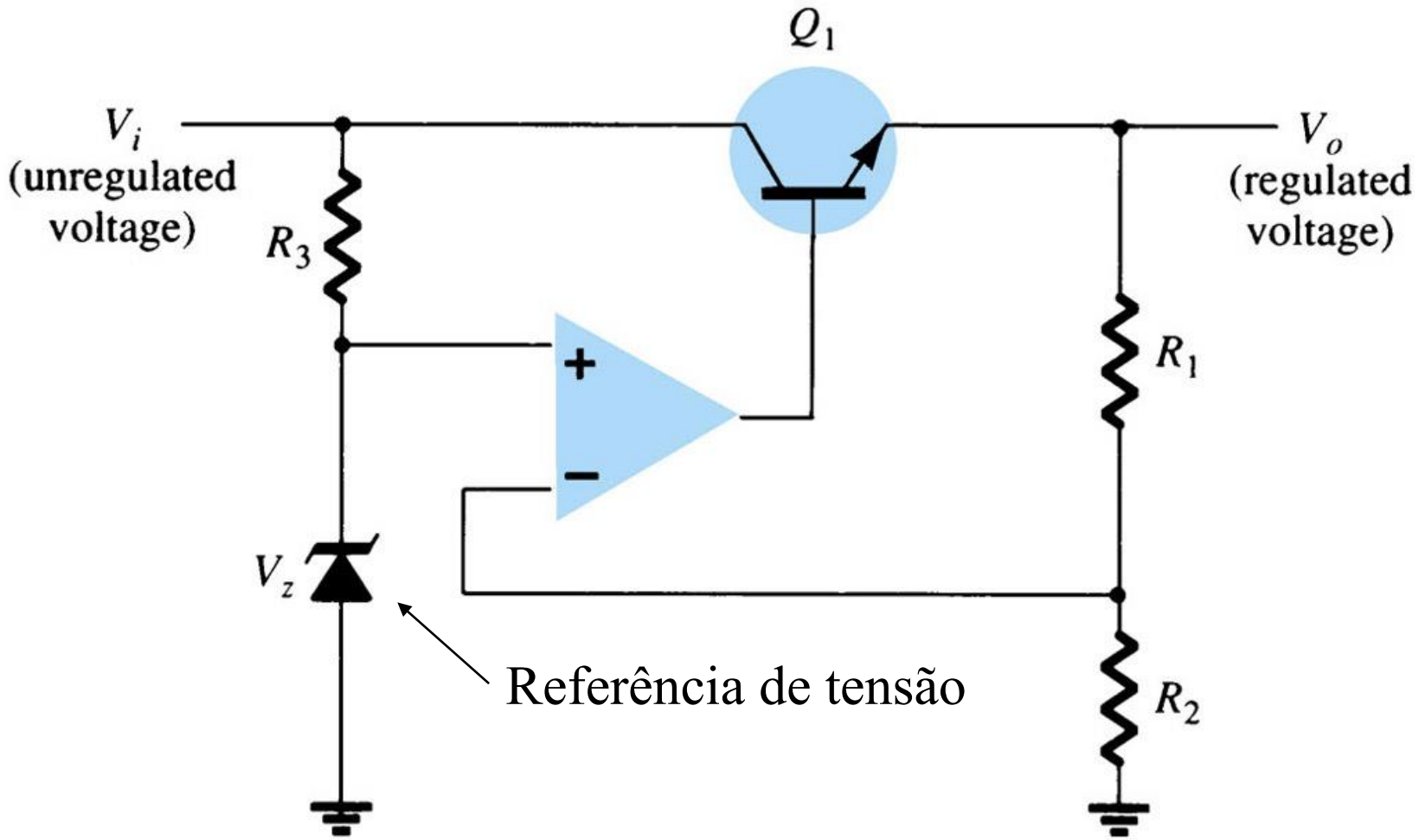
Fontes Reguladas



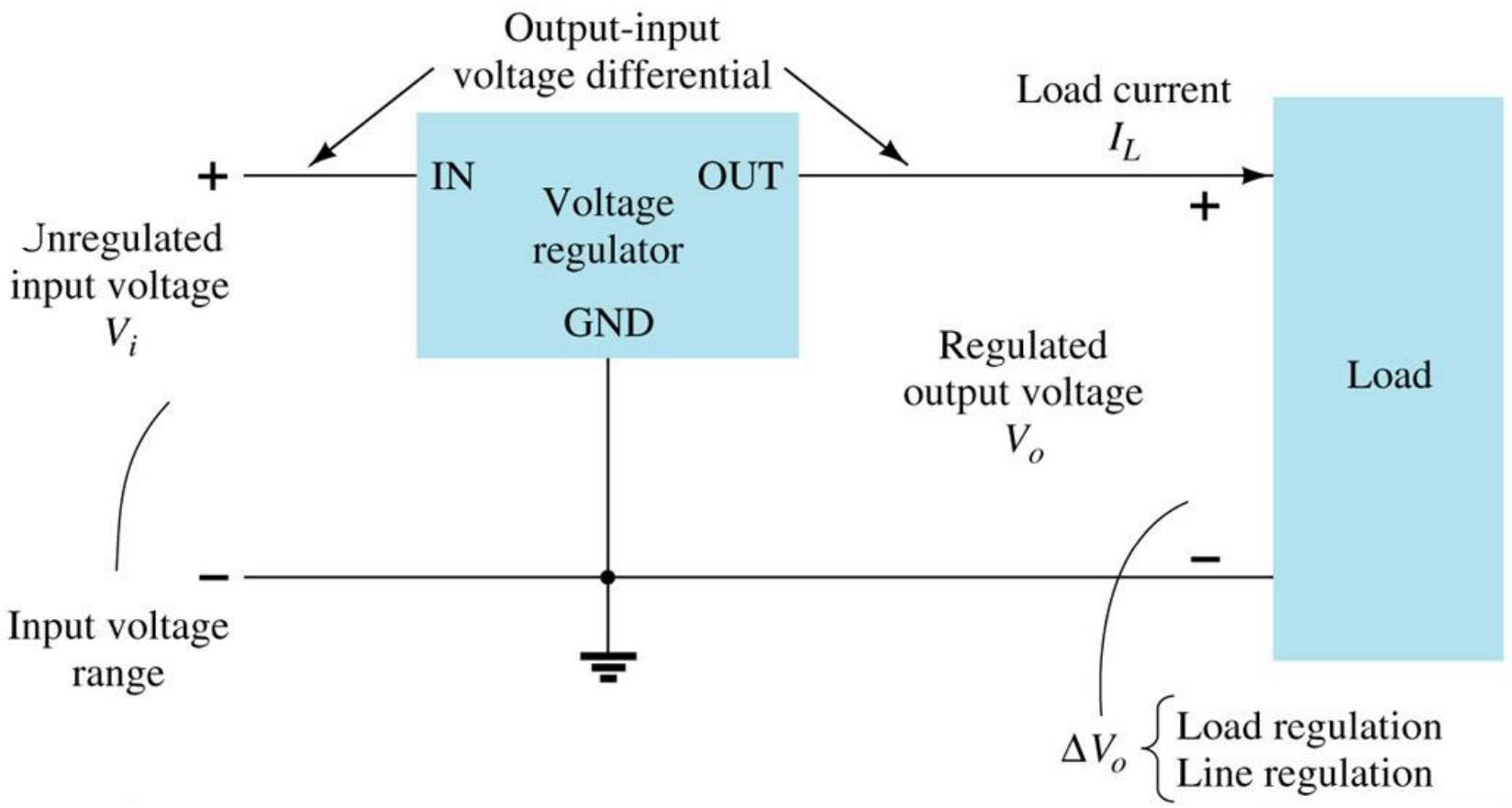
Fontes Reguladas



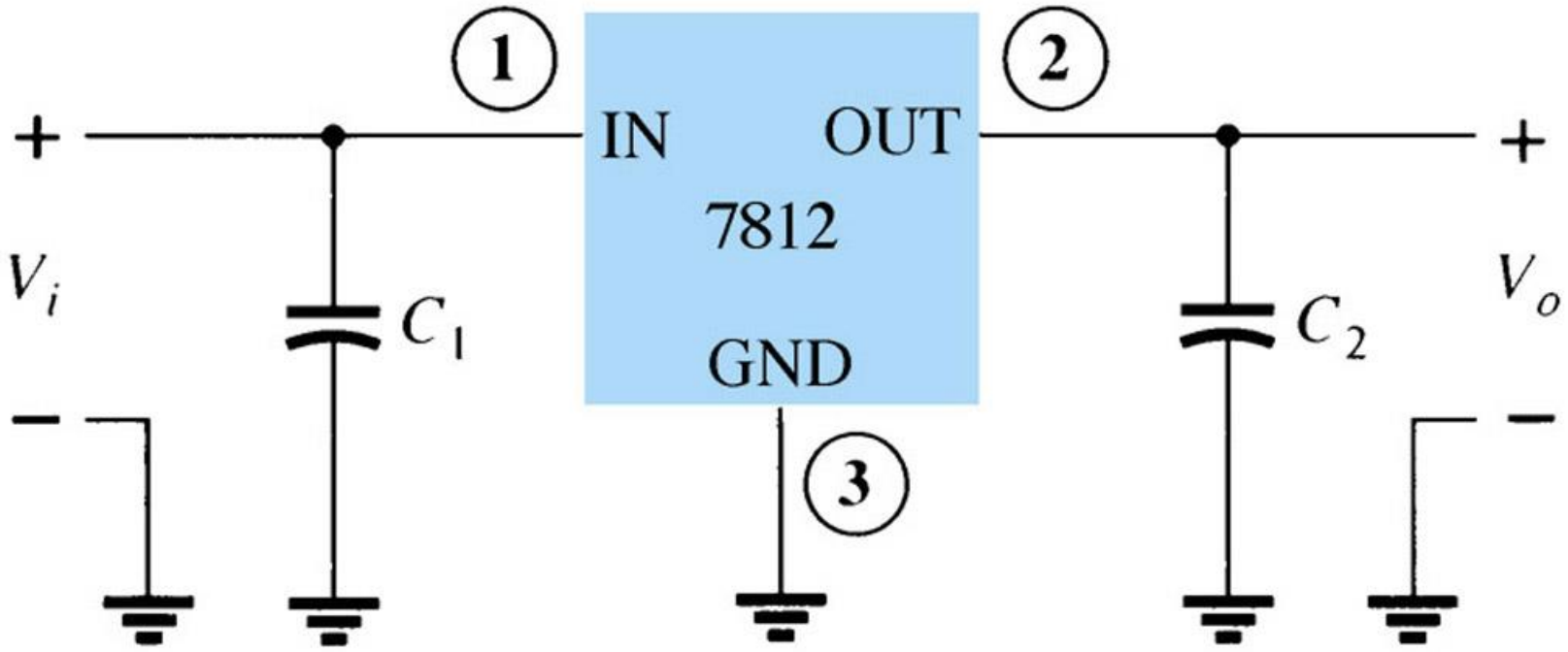
Fontes Reguladas



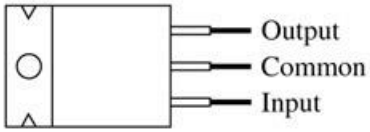
Reguladores de Tensão - CI



Reguladores de Tensão - CI



Reguladores de Tensão - CI



Nominal output voltage	Regulator
5 V	7805
6 V	7806
8 V	7808
10 V	7810
12 V	7812
15 V	7815
18 V	7818
24 V	7824

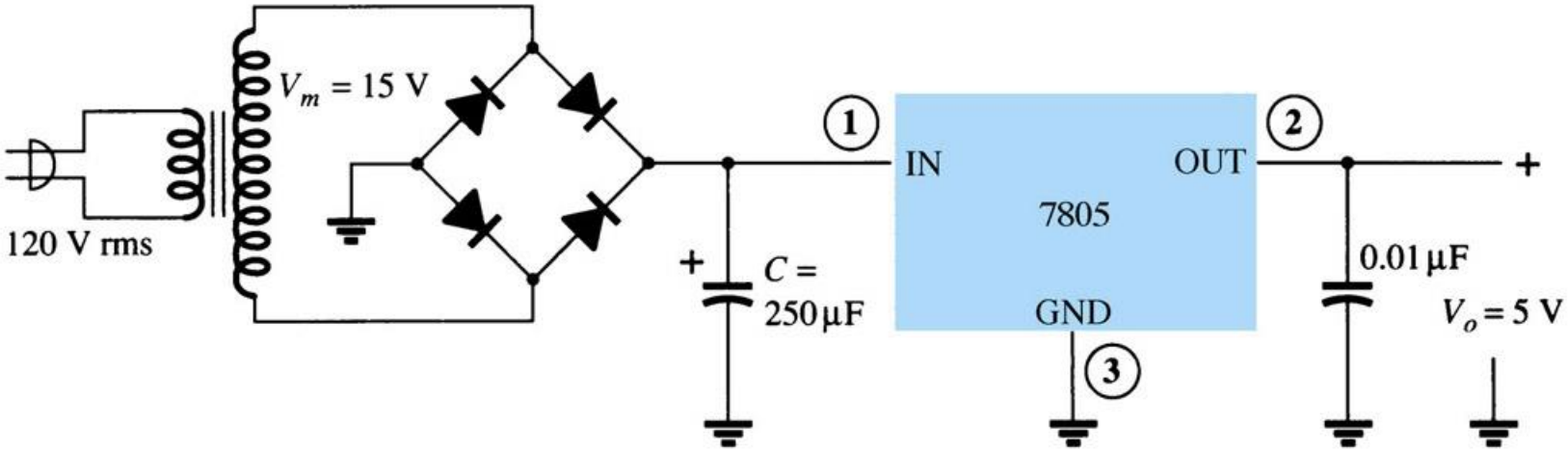
Absolute maximum ratings:

Input voltage	40 V
Continuous total dissipation	2 W
Operating free-air temperature range	−65 to 150°C

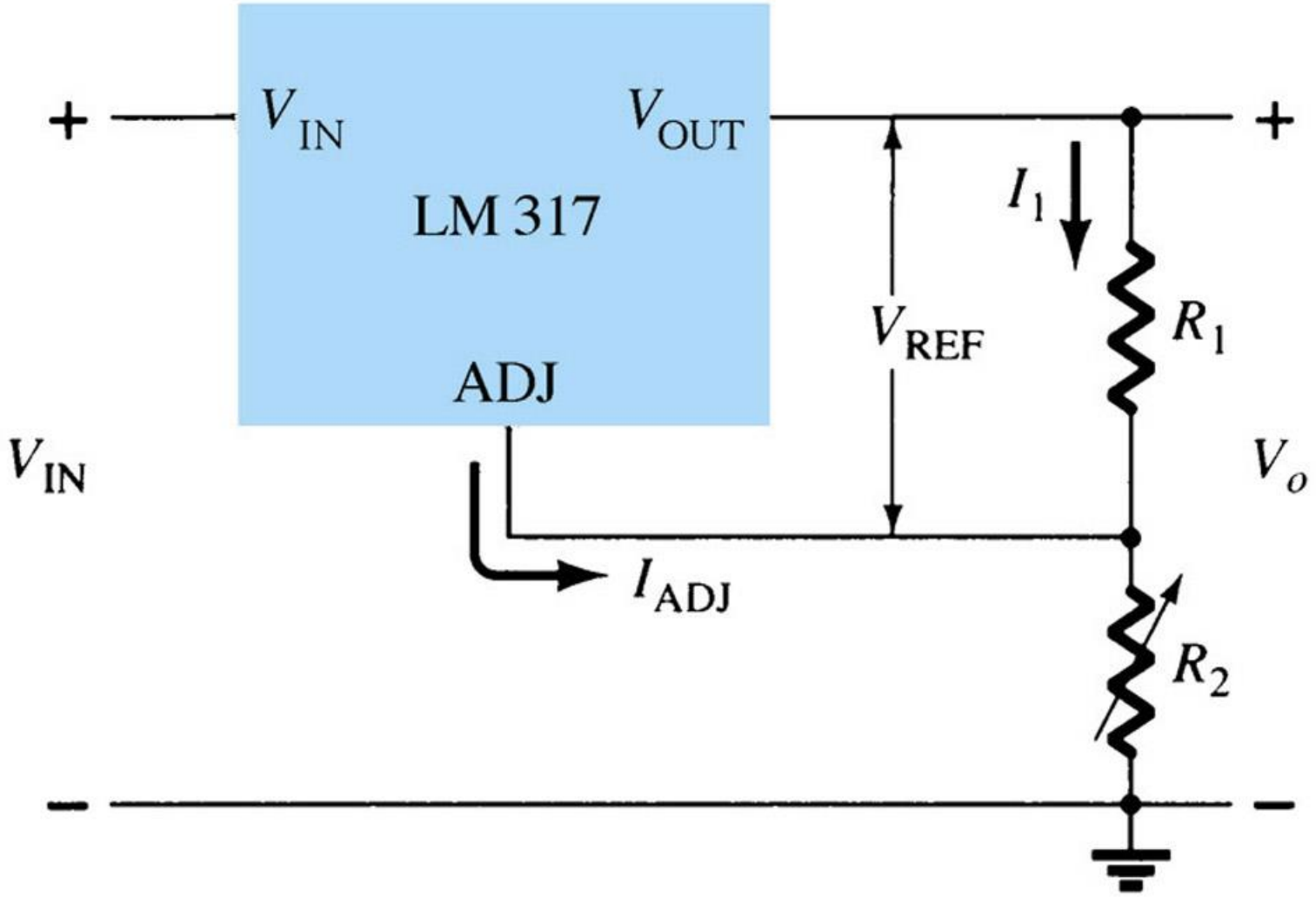
µA 7812C electrical characteristics:

Parameter	Min.	Typ.	Max.	Units
Output voltage	11.5	12	12.5	V
Input regulation		3	120	mV
Ripple rejection	55	71		dB
Output regulation		4	100	mV
Output resistance		0.018		Ω
Dropout voltage		2.0		V
Short-circuit output current		350		mA
Peak output current		2.2		A

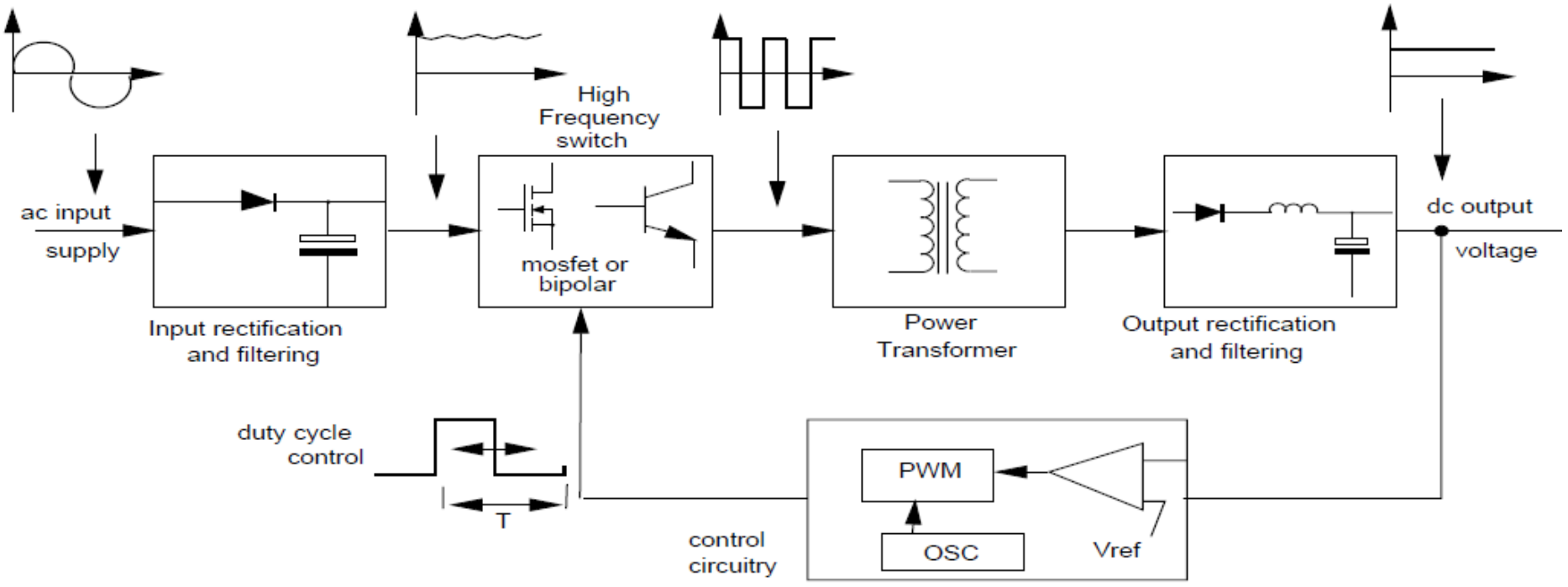
Ex.: Fonte Regulada



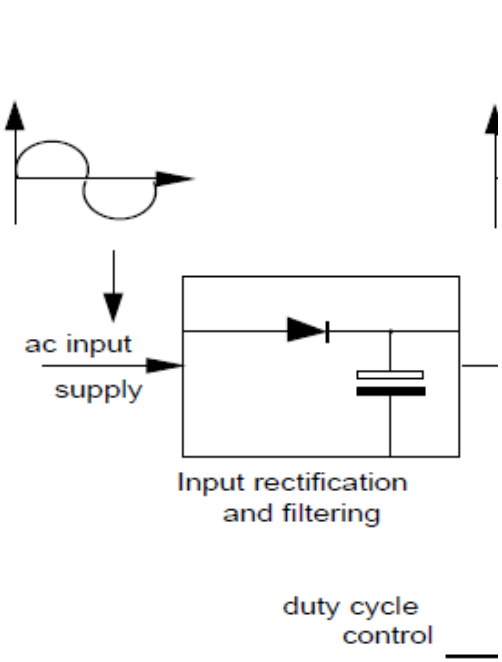
Reguladores de Tensão Ajustáveis

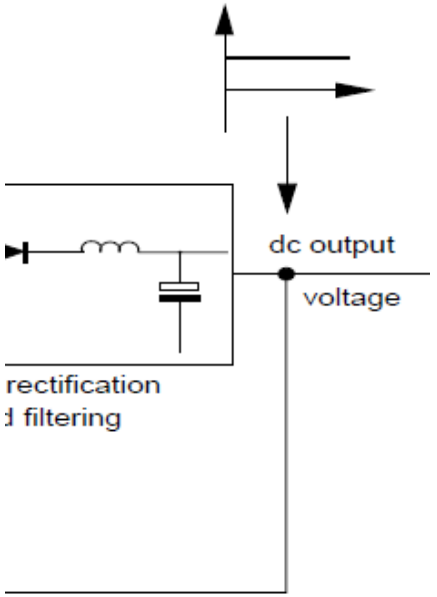


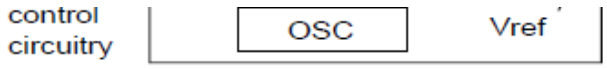
Fontes Chaveadas



Fontes Comerciais







Fontes de Laboratório