

Instituto Federal de Educação, Ciência e Tecnologia de Santa Catarina

Departamento Acadêmico de Eletrônica

Eletrônica de Potência



Conversores CC-CC Isolados

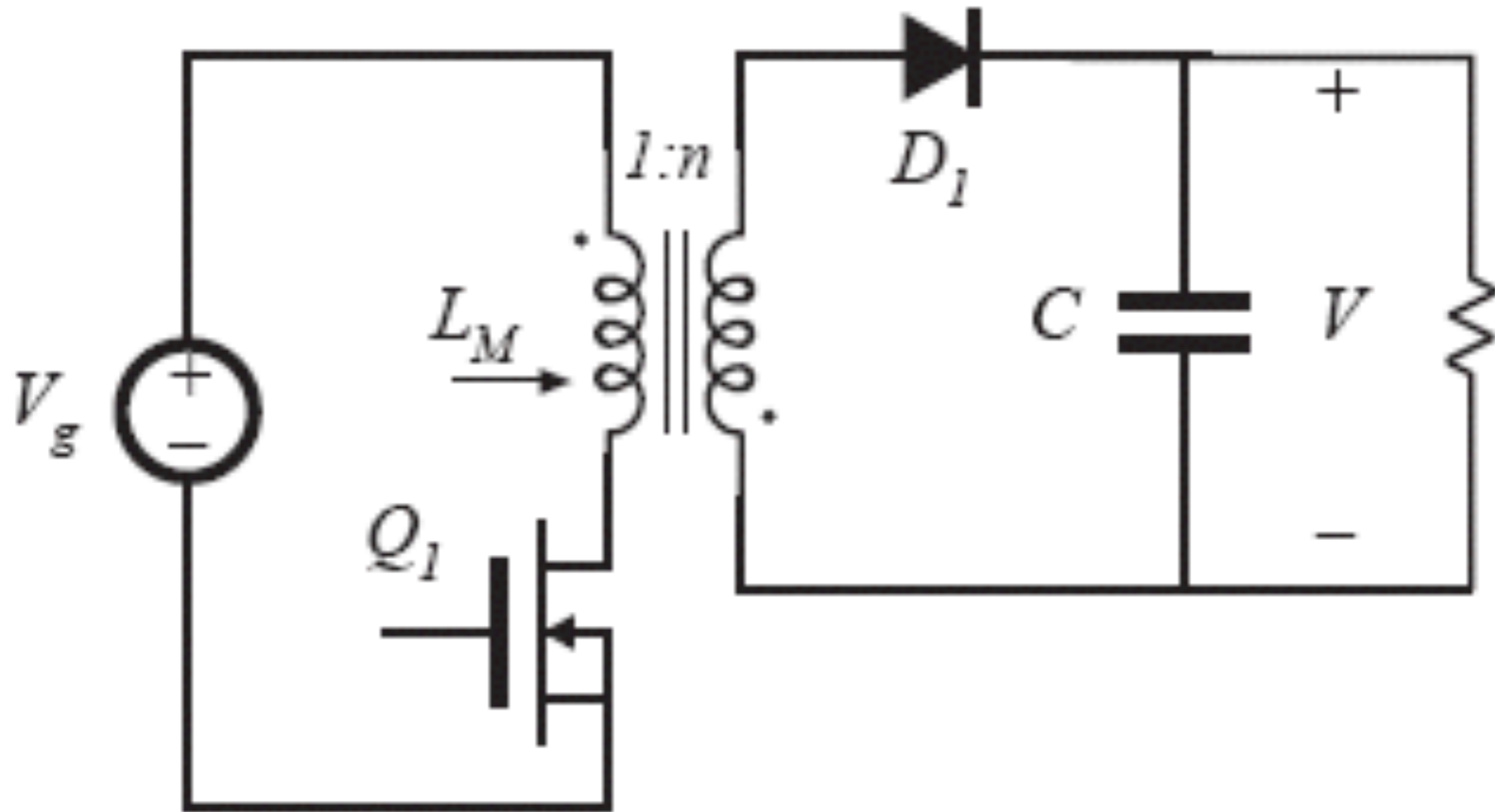
Prof. Clovis Antonio Petry.

Florianópolis, dezembro de 2015.

Conversores cc-cc isolados:

- Conversor Flyback;
- Conversor Forward;
- Outros conversores isolados.

Conversor Flyback



Conversor Flyback

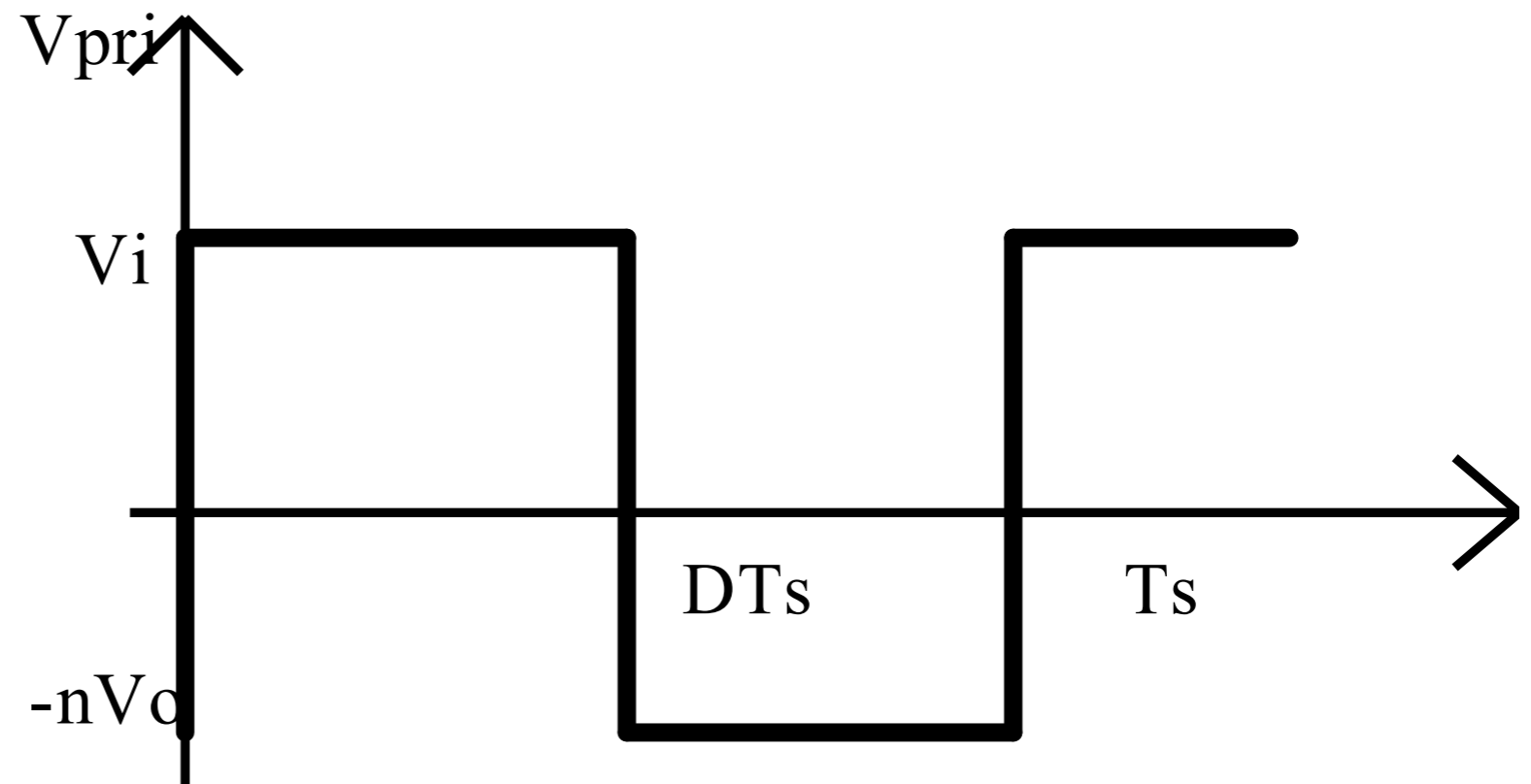
$$V_{pri} = \frac{1}{T_s} \int_0^{D \cdot T_s} V_i \cdot dt + \frac{1}{T_s} \int_{D \cdot T_s}^{T_s} (-n \cdot V_o) \cdot dt$$



$$\frac{n \cdot V_o}{V_i} = \frac{D}{1 - D}$$

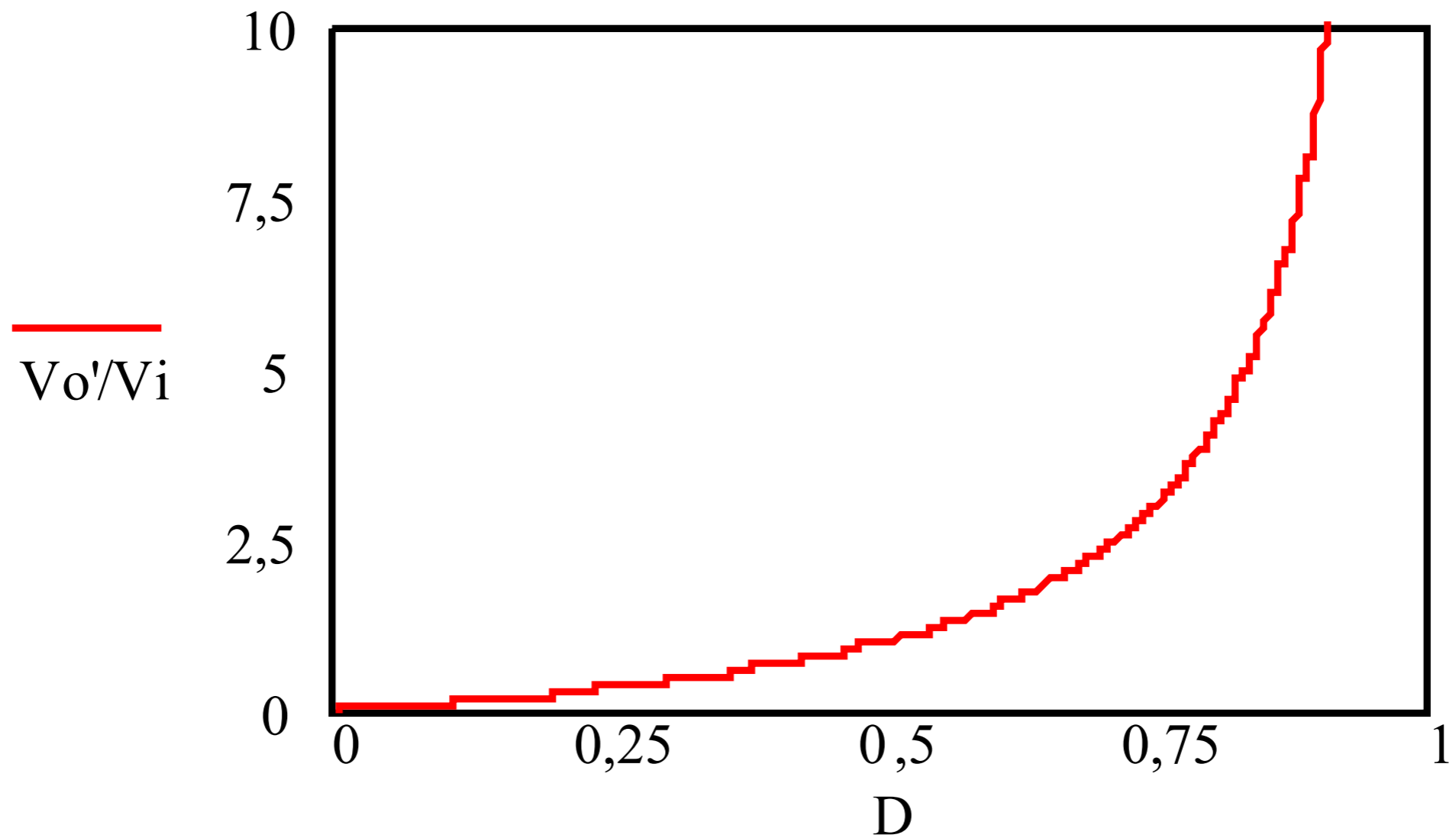
$$V'_o = n \cdot V_o$$

$$\frac{V'_o}{V_i} = \frac{D}{1 - D}$$

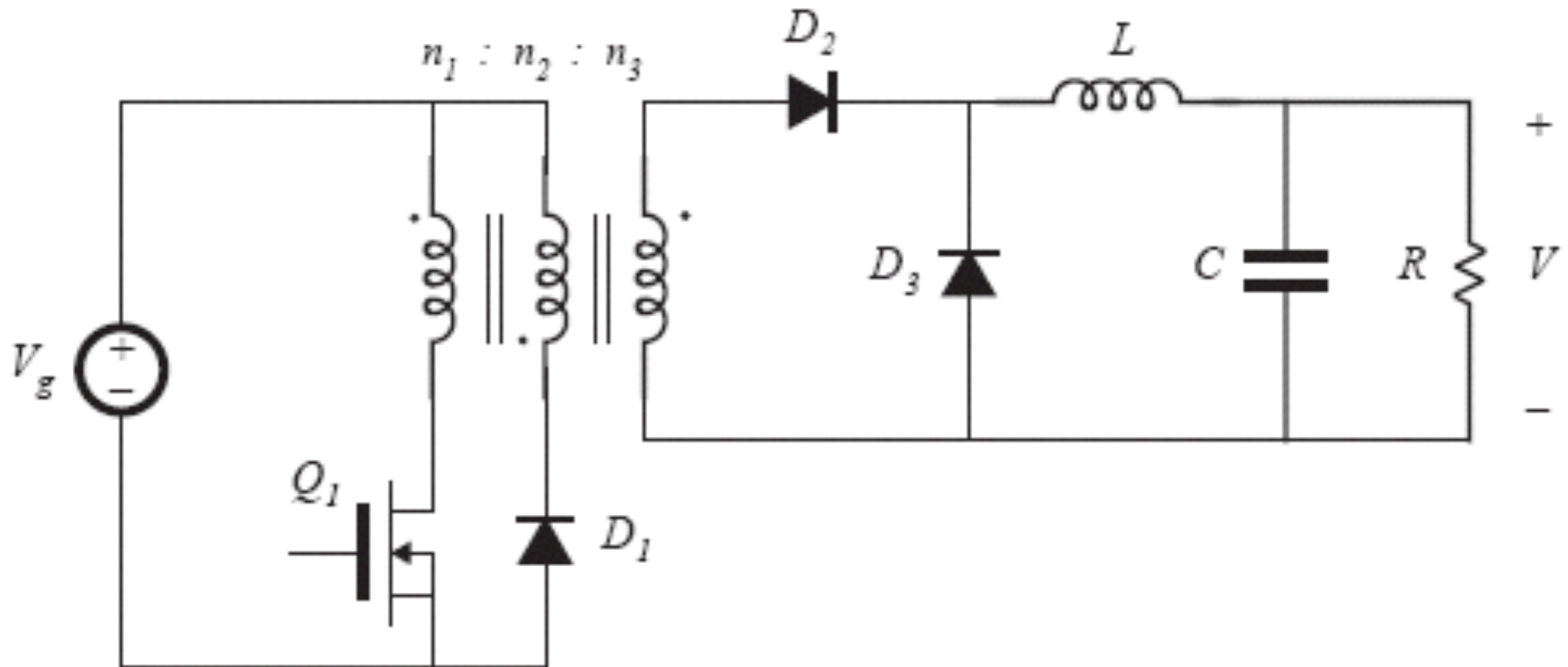


Conversor Flyback

Ganho estático em função da razão cíclica:



Conversor Forward



Conversor Forward

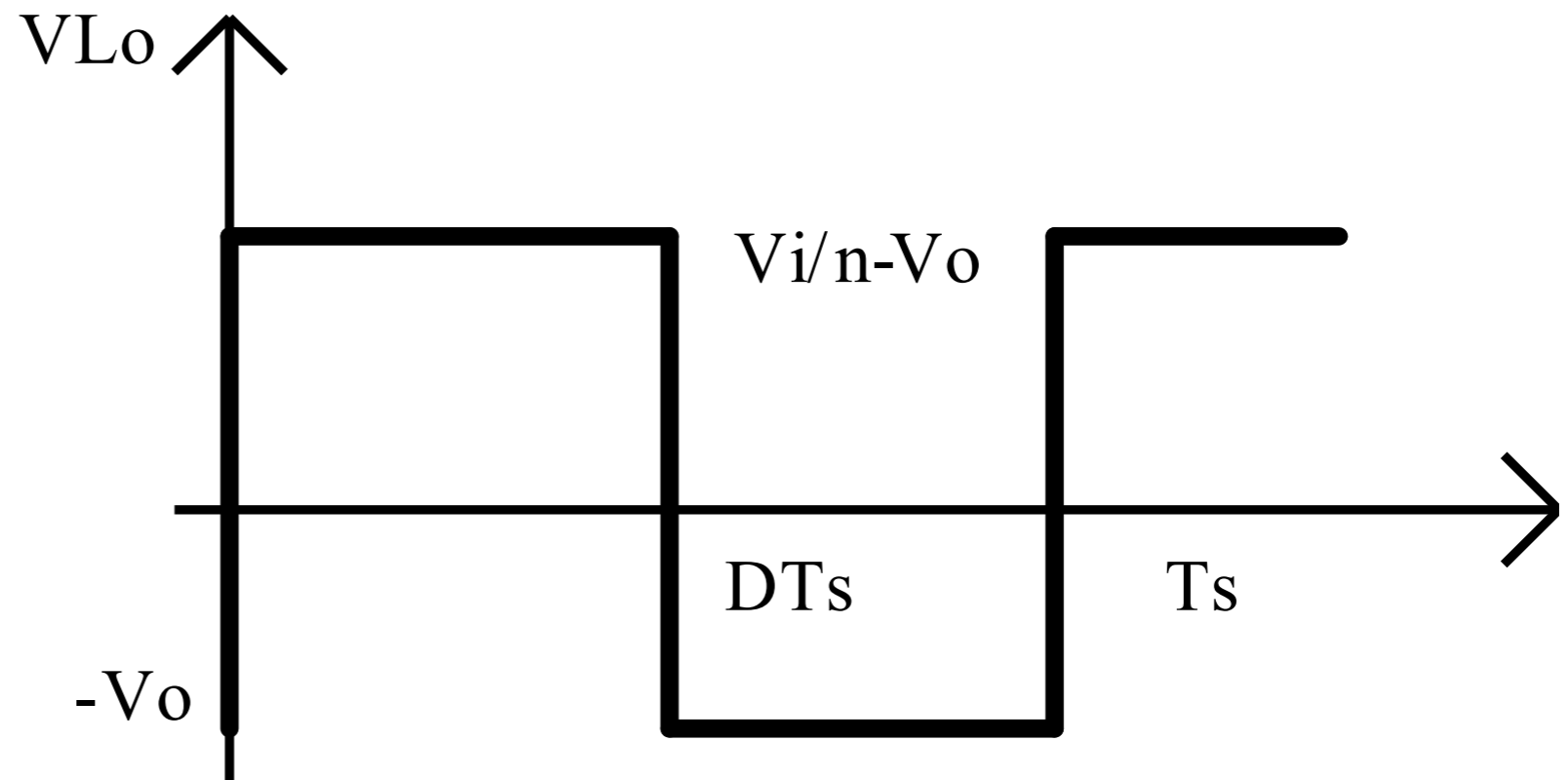
$$\frac{1}{T_s} \int_0^{DT_s} \left(\frac{V_i}{n} - V_o \right) dt = \frac{1}{T_s} \int_0^{(1-D)T_s} V_o dt$$



$$\frac{n \cdot V_o}{V_i} = D$$

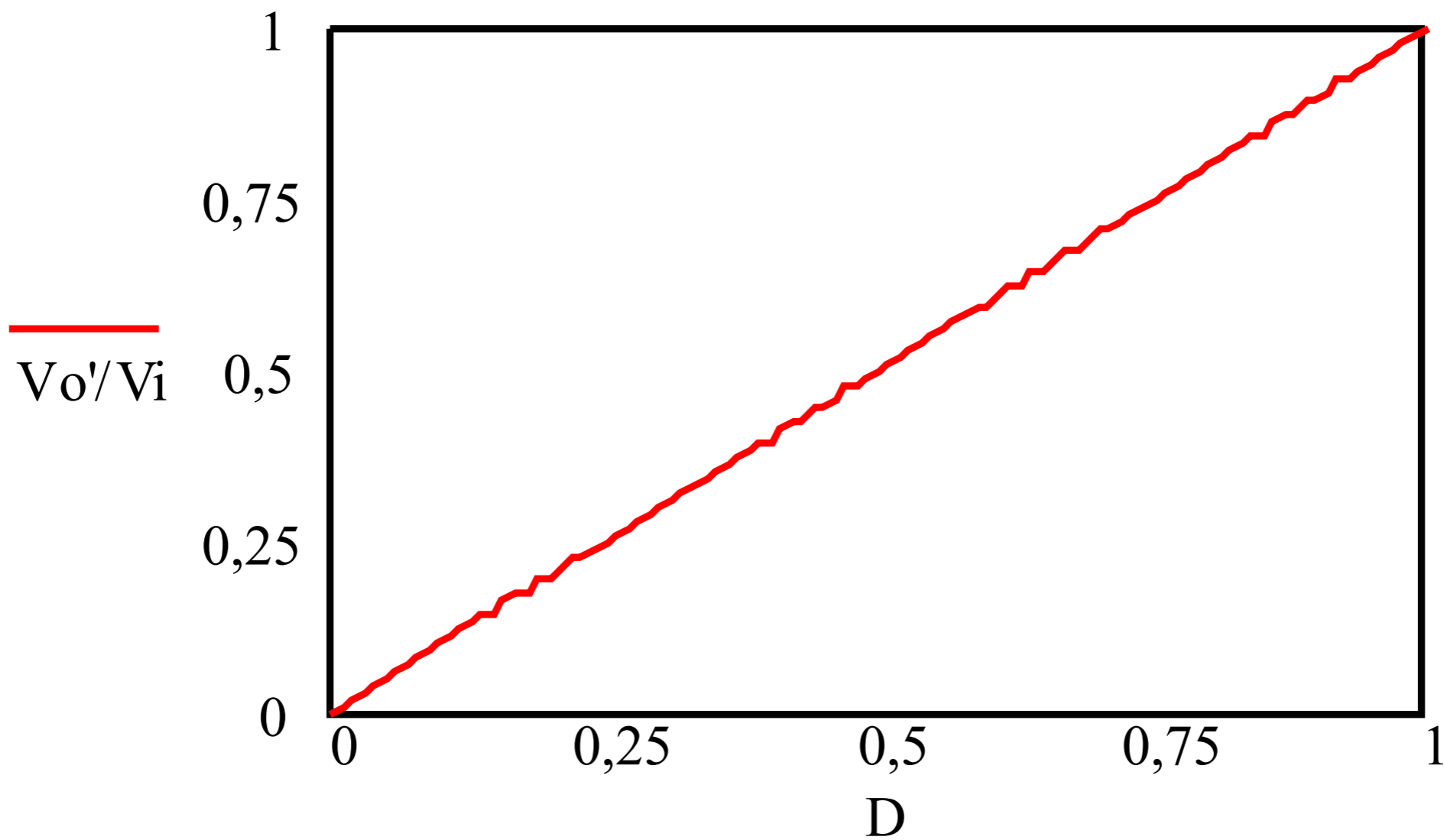
$$V'_o = n \cdot V_o$$

$$\frac{V'_o}{V_i} = D$$

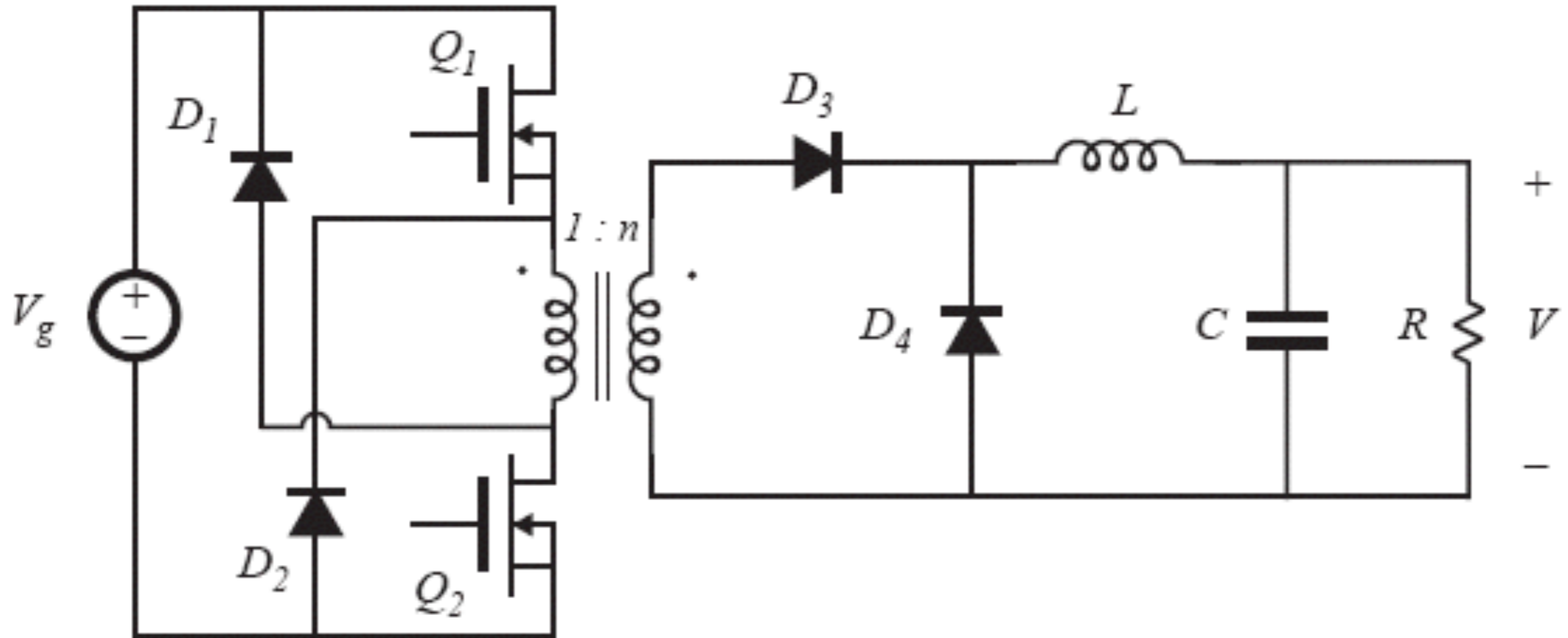


Conversor Forward

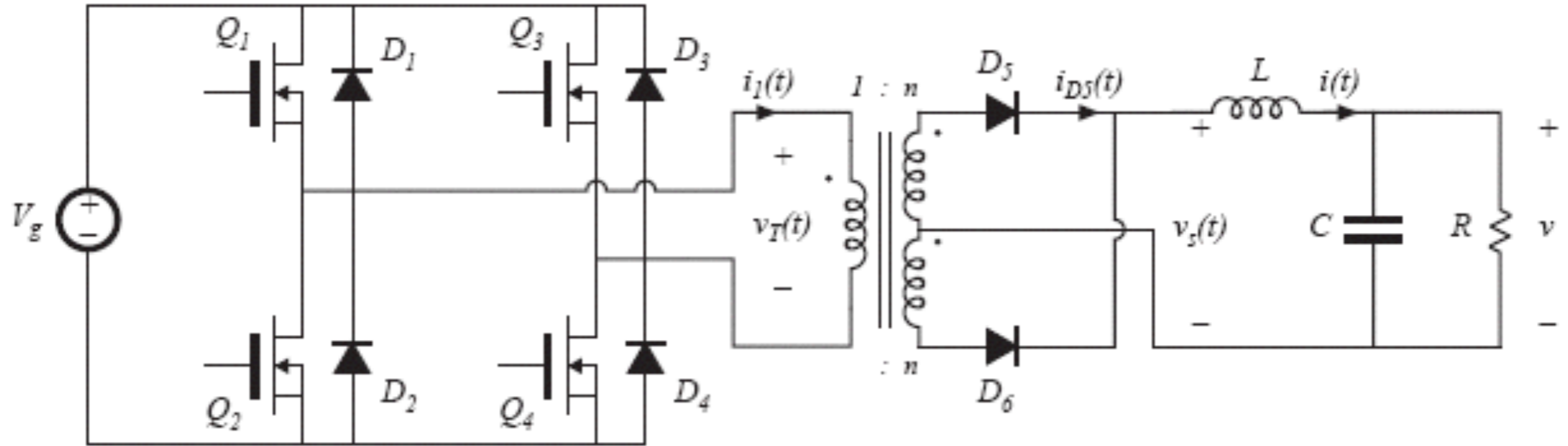
Ganho estático em função da razão cíclica:



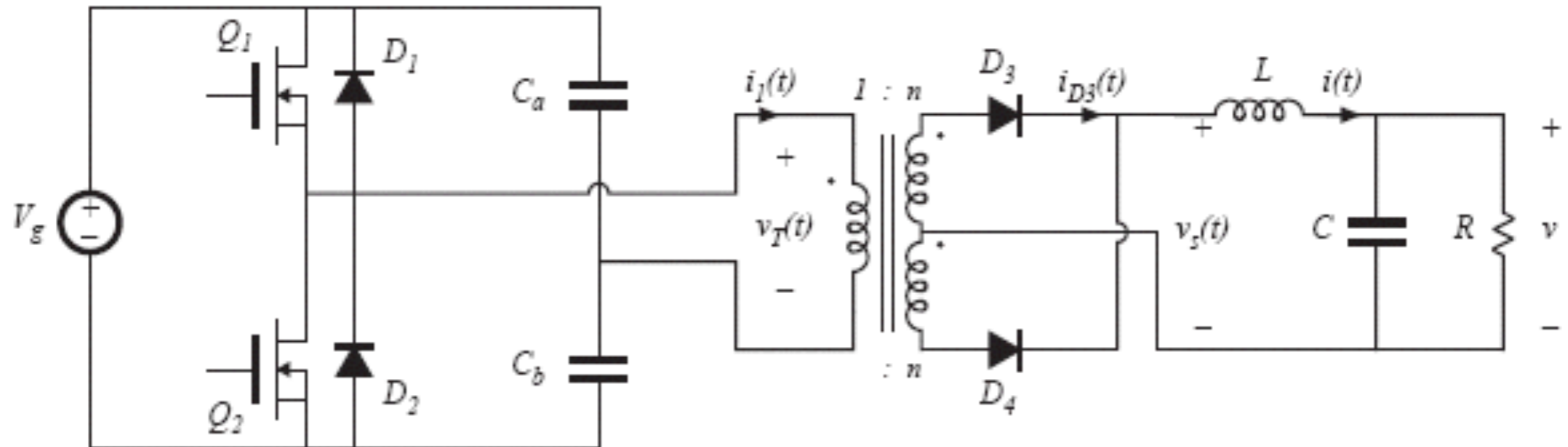
Conversor Forward com Dois Transistores



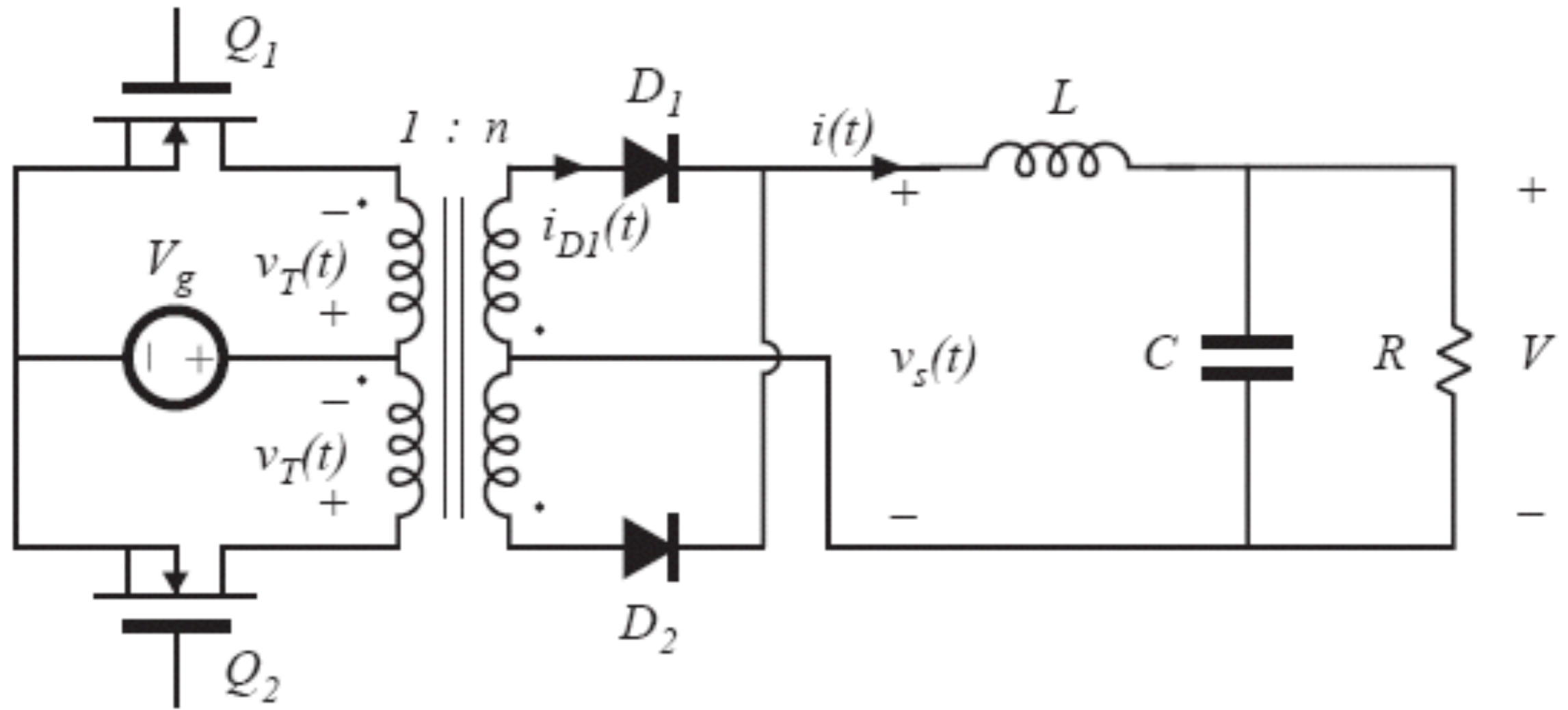
Conversor Ponte Completa Isolado



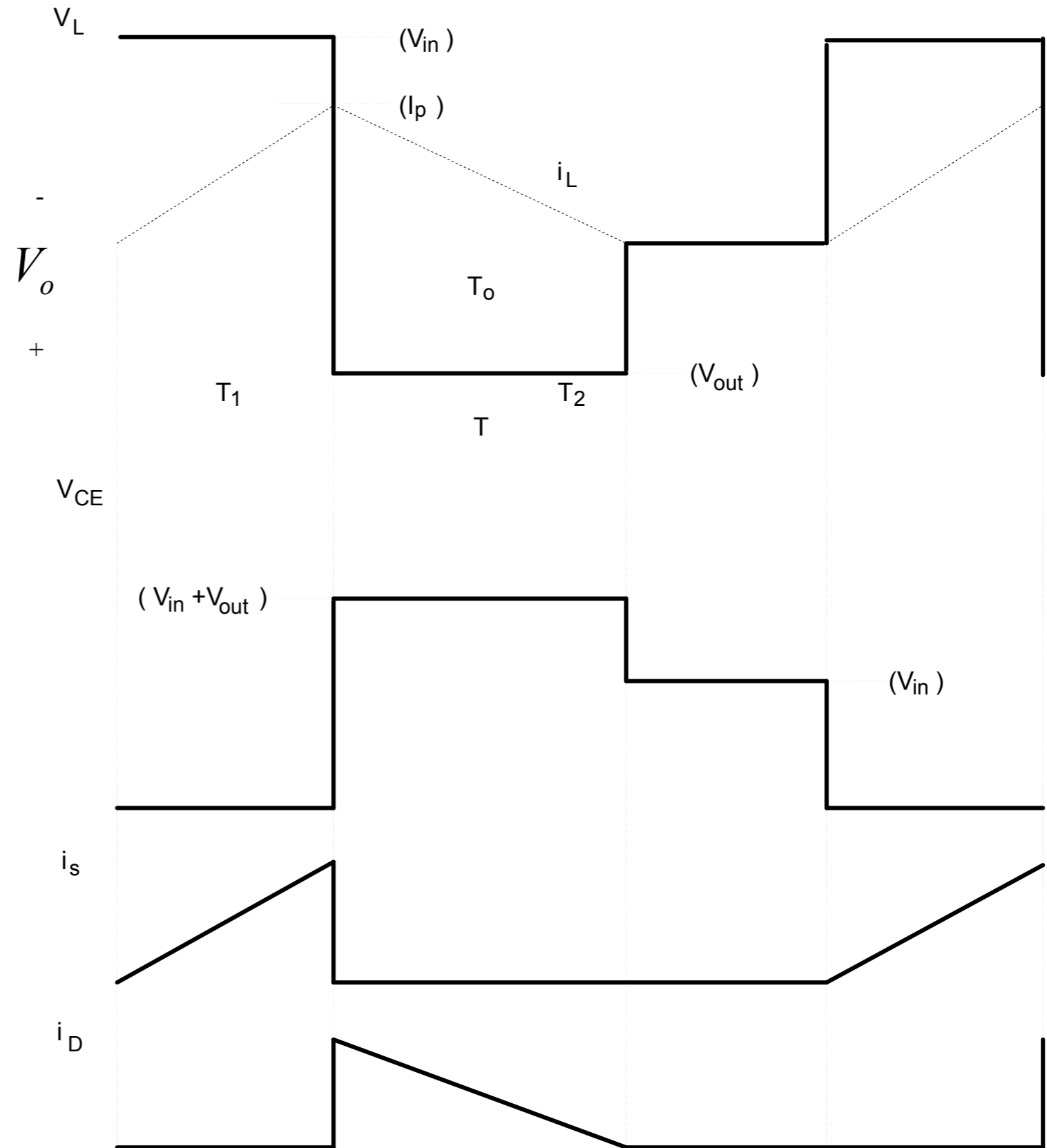
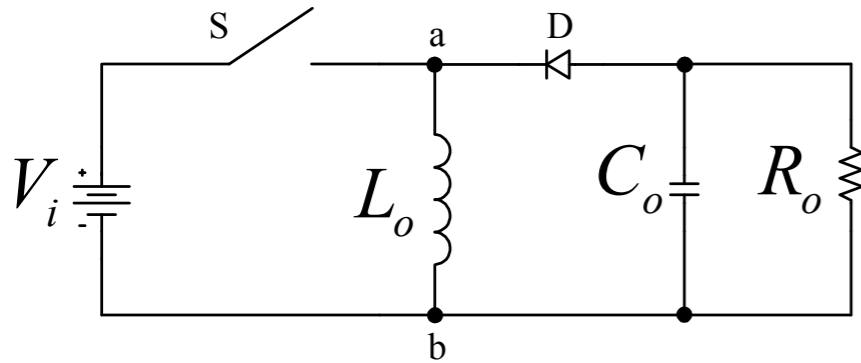
Conversor Meia Ponte Isolado



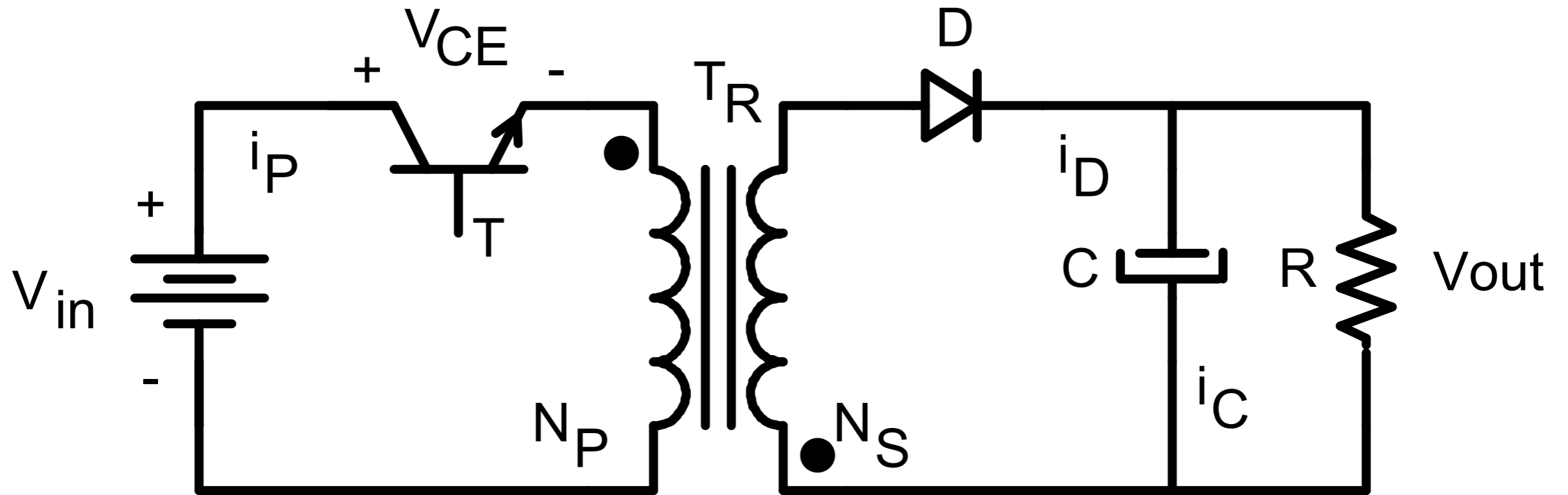
Conversor Push-Pull



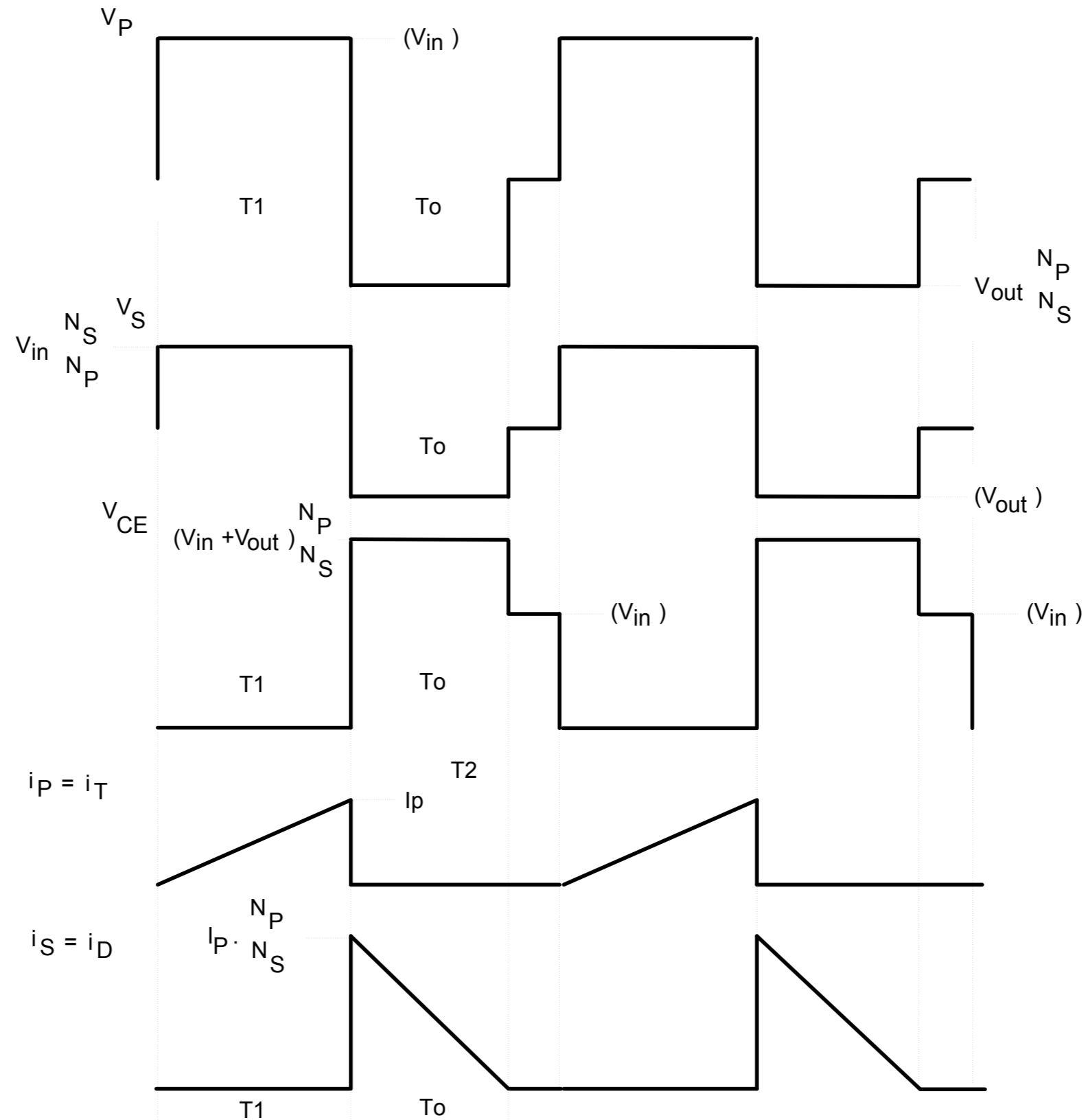
Conversor Flyback - Detalhamento



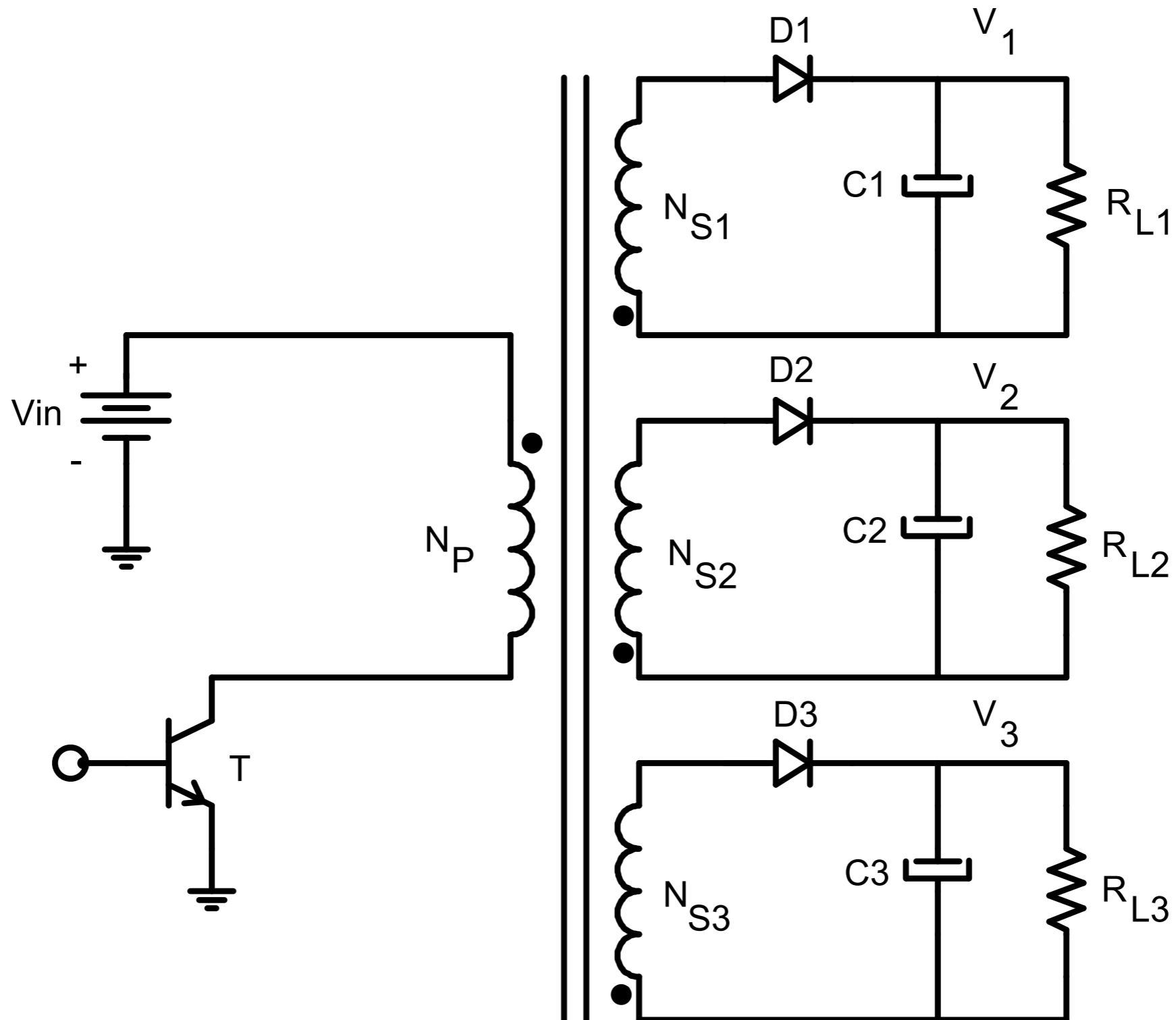
Conversor Flyback - Detalhamento



Conversor Flyback - Detalhamento



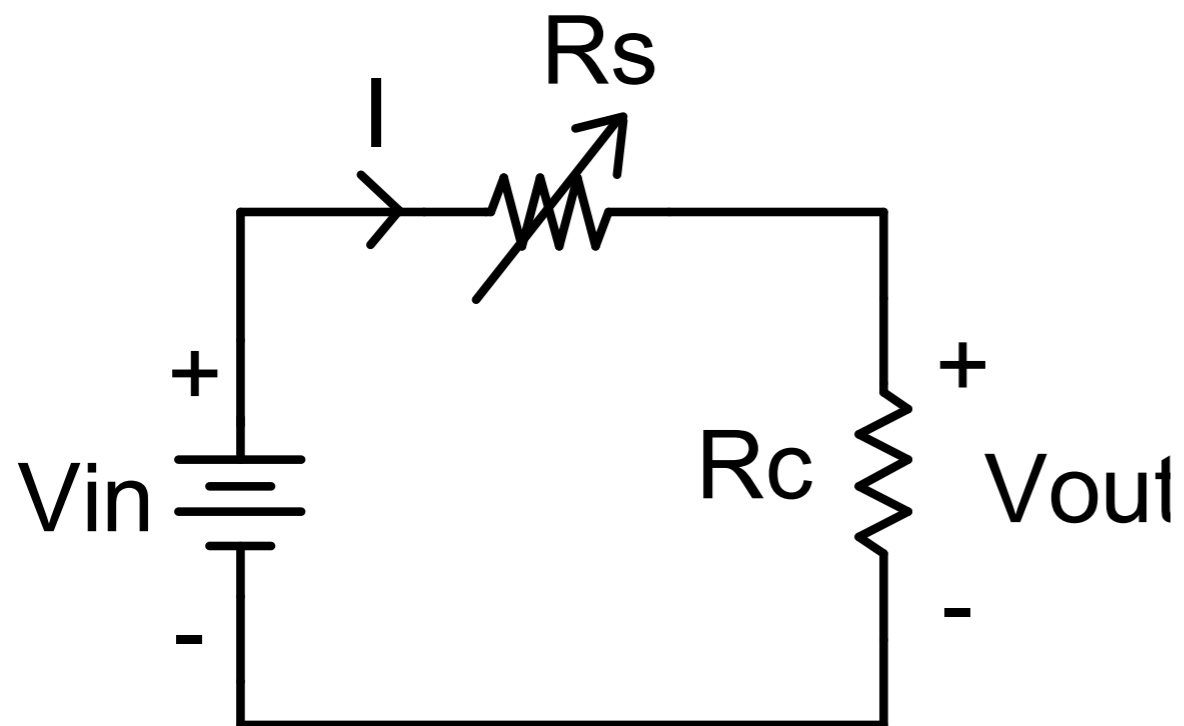
Conversor Flyback - Detalhamento



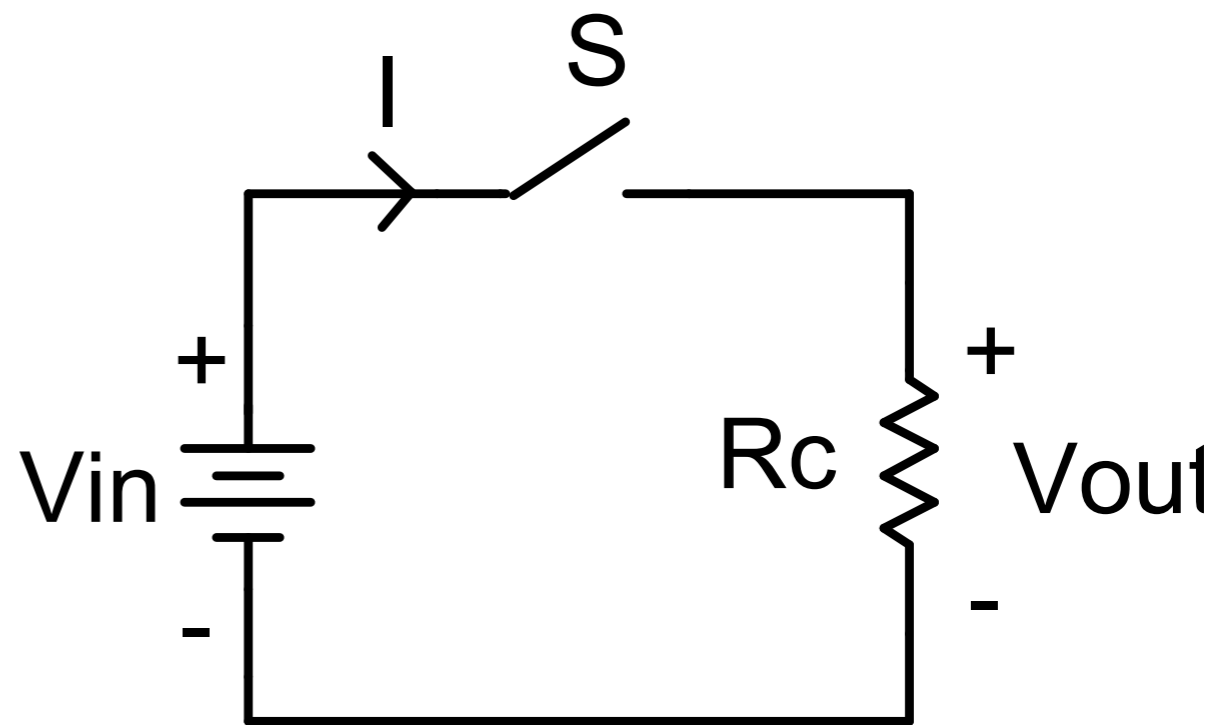
Fontes Lineares x Fontes Chaveadas

Fontes de tensão lineares e chaveadas:

- As fontes lineares convertem a tensão alternada da rede em tensões contínuas, normalmente de baixa amplitude, sem o uso de componentes chaveados (comutados);
- Fontes chaveadas exercem a mesma função, mas utilizando componentes comutados (chaveados).



Regulador linear



Regulador chaveado

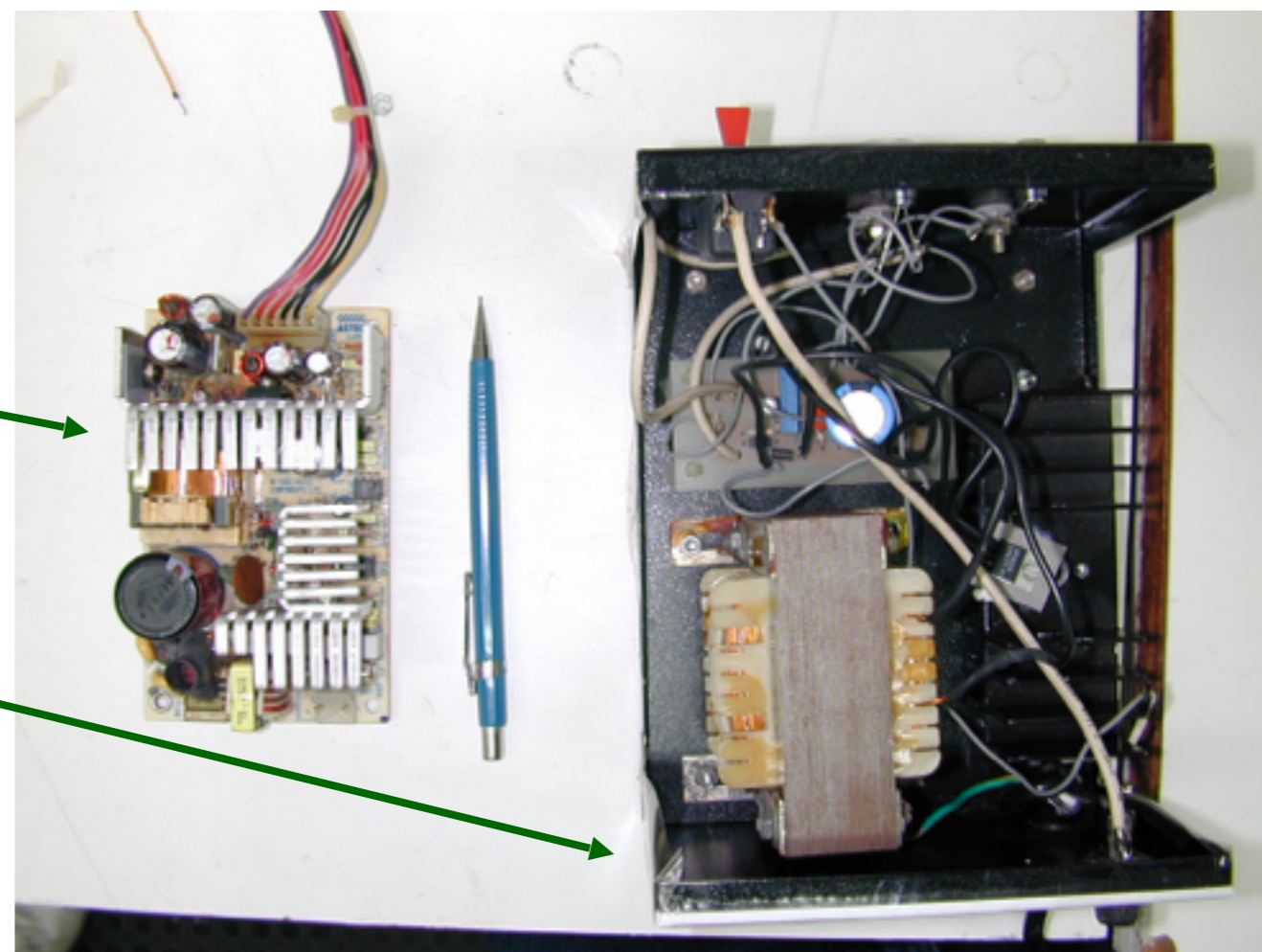
Fontes Lineares x Fontes Chaveadas

Fontes de tensão lineares x chaveadas:

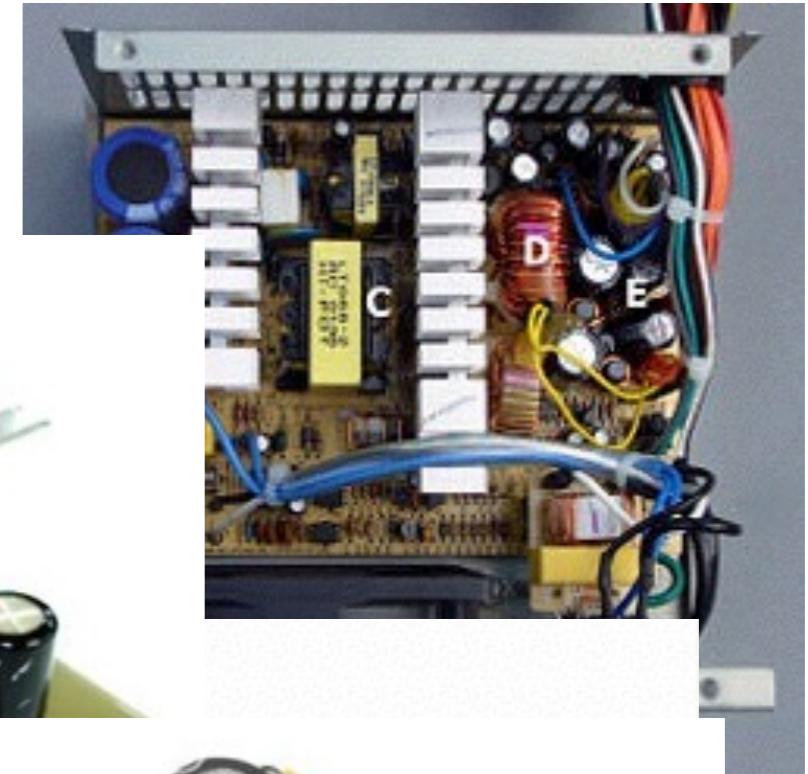
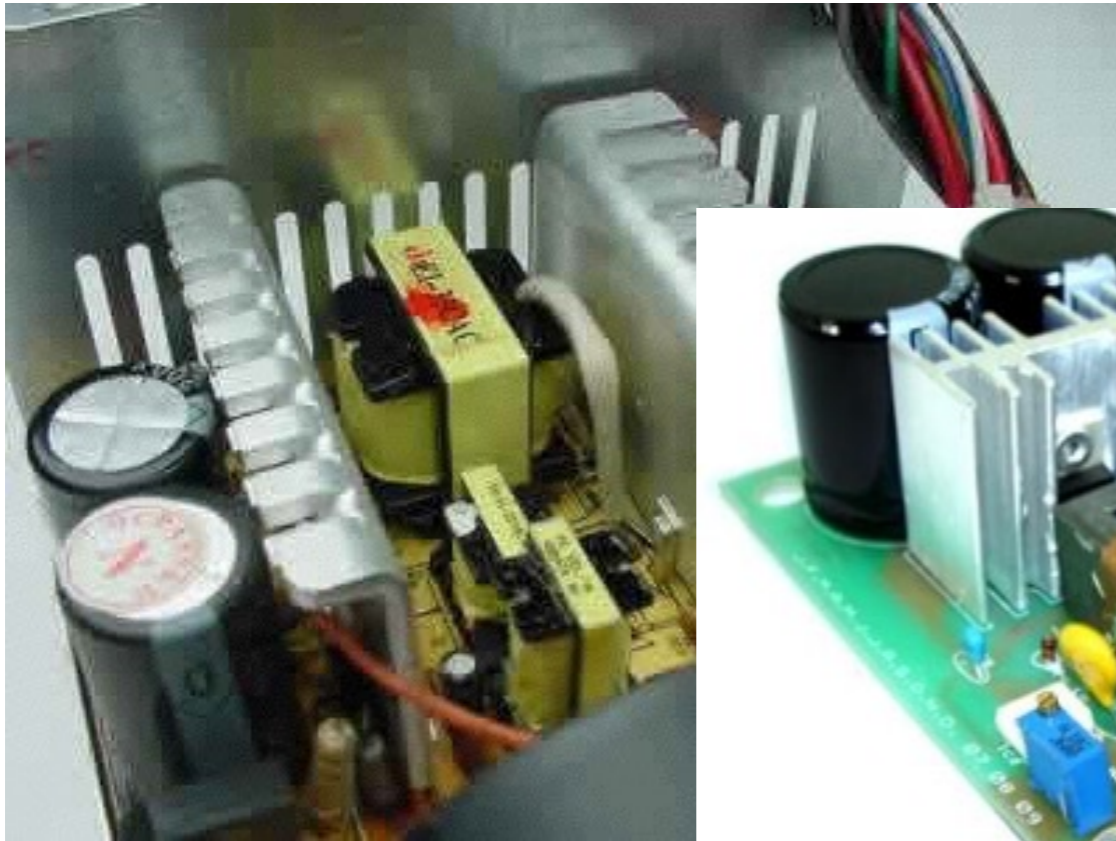
- Fontes lineares: são mais robustas, simples e fáceis de projetar, podem ser mais baratas ou não, são muito volumosas e pesadas.
- Fontes chaveadas: não são tão robustas, mais difíceis de projetar e **consertar**, podem ser mais baratas ou não, são pequenas e leves.

Fonte chaveada de 65 W

Fonte linear de 29 W

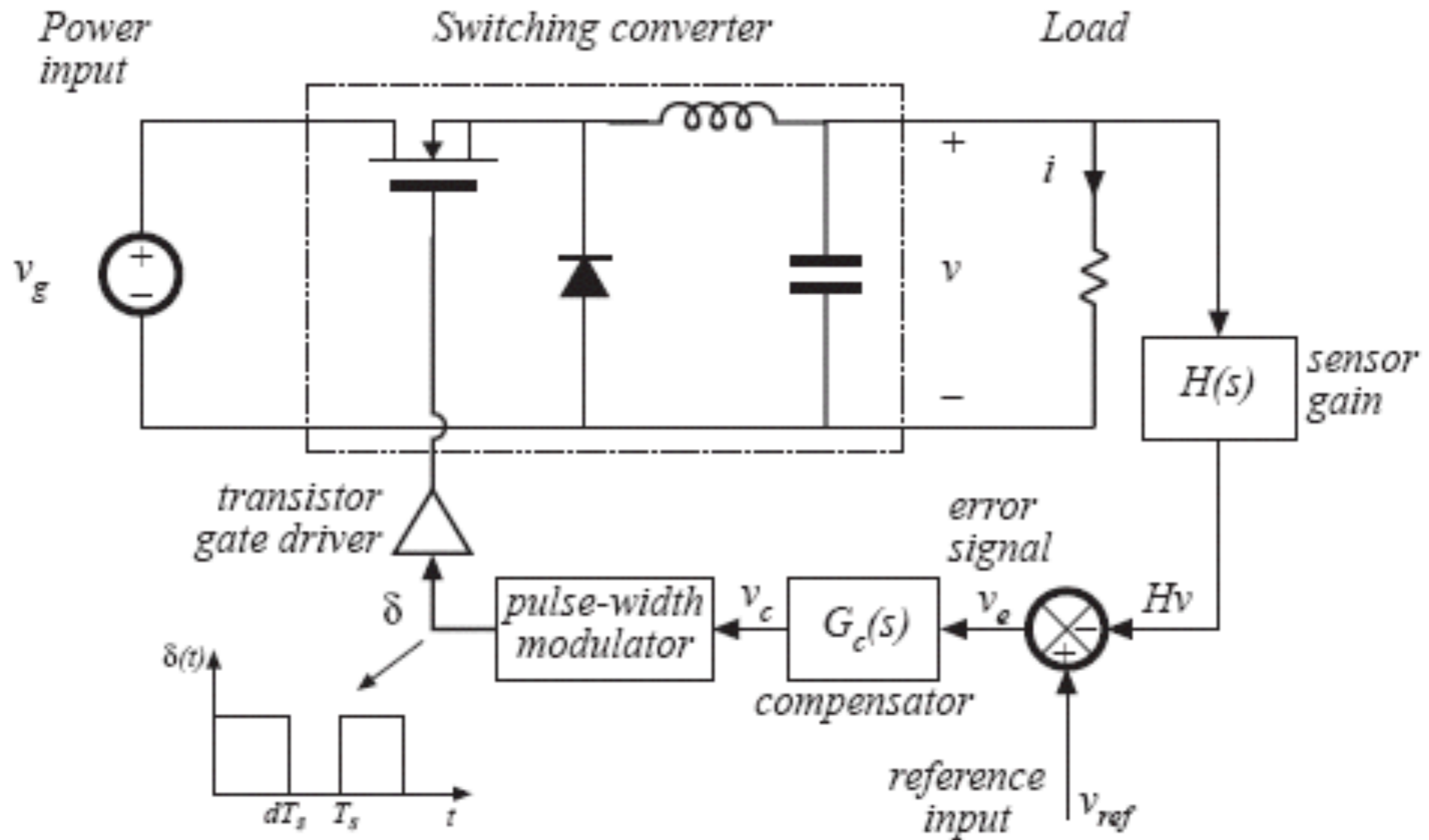


Fontes Chaveadas

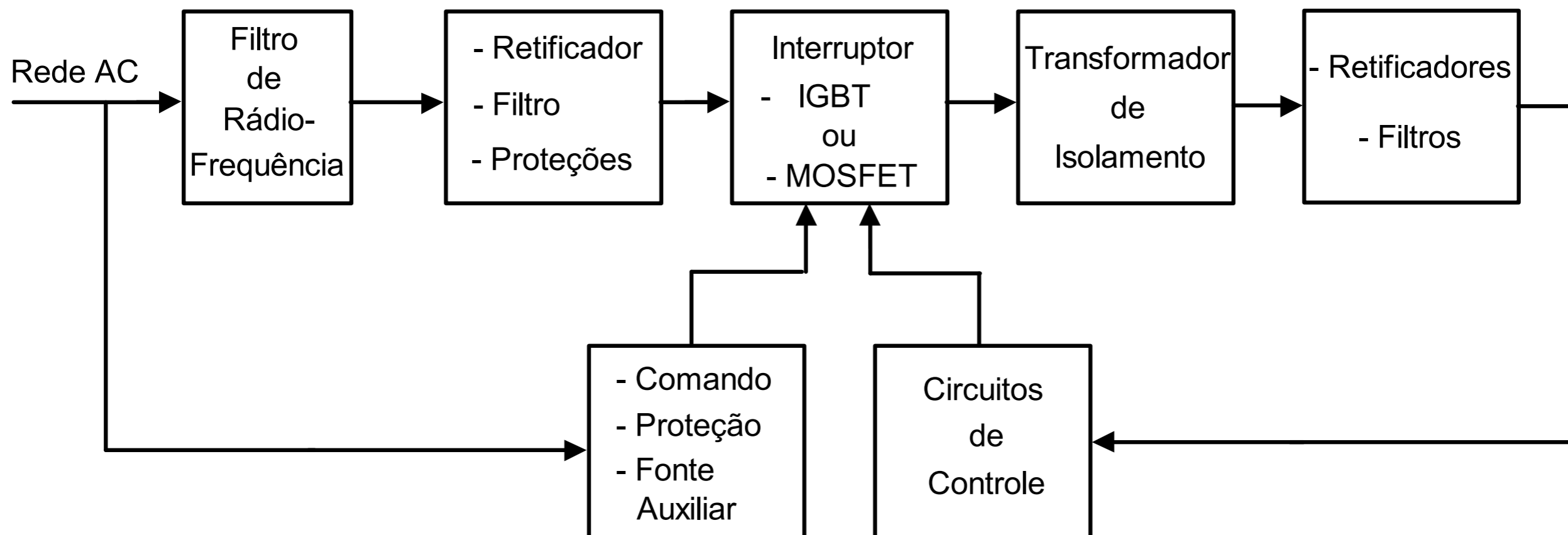


A = Comprimento
B = Largura
C = Altura

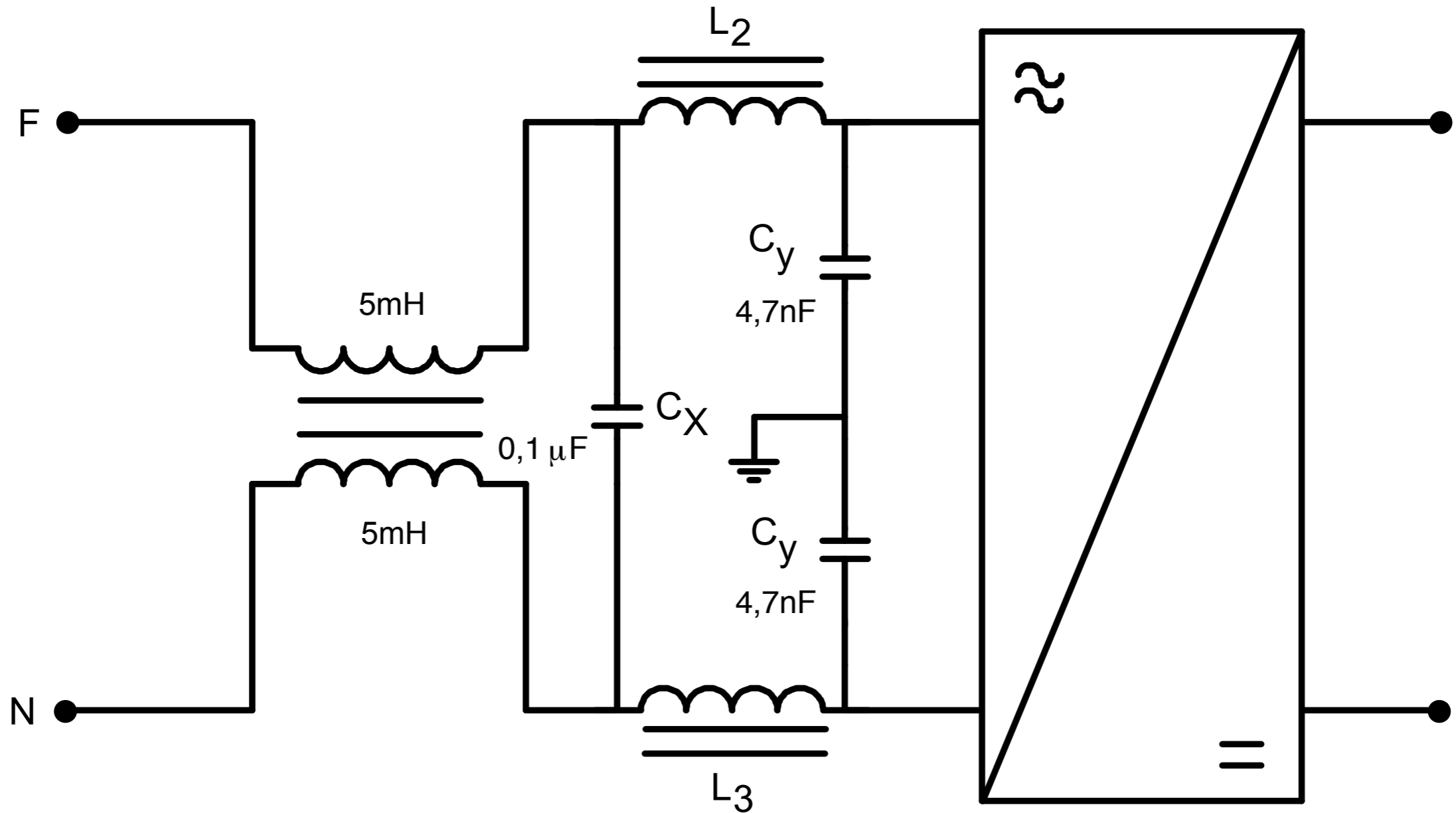
Fontes Chaveadas - Diagrama de Blocos



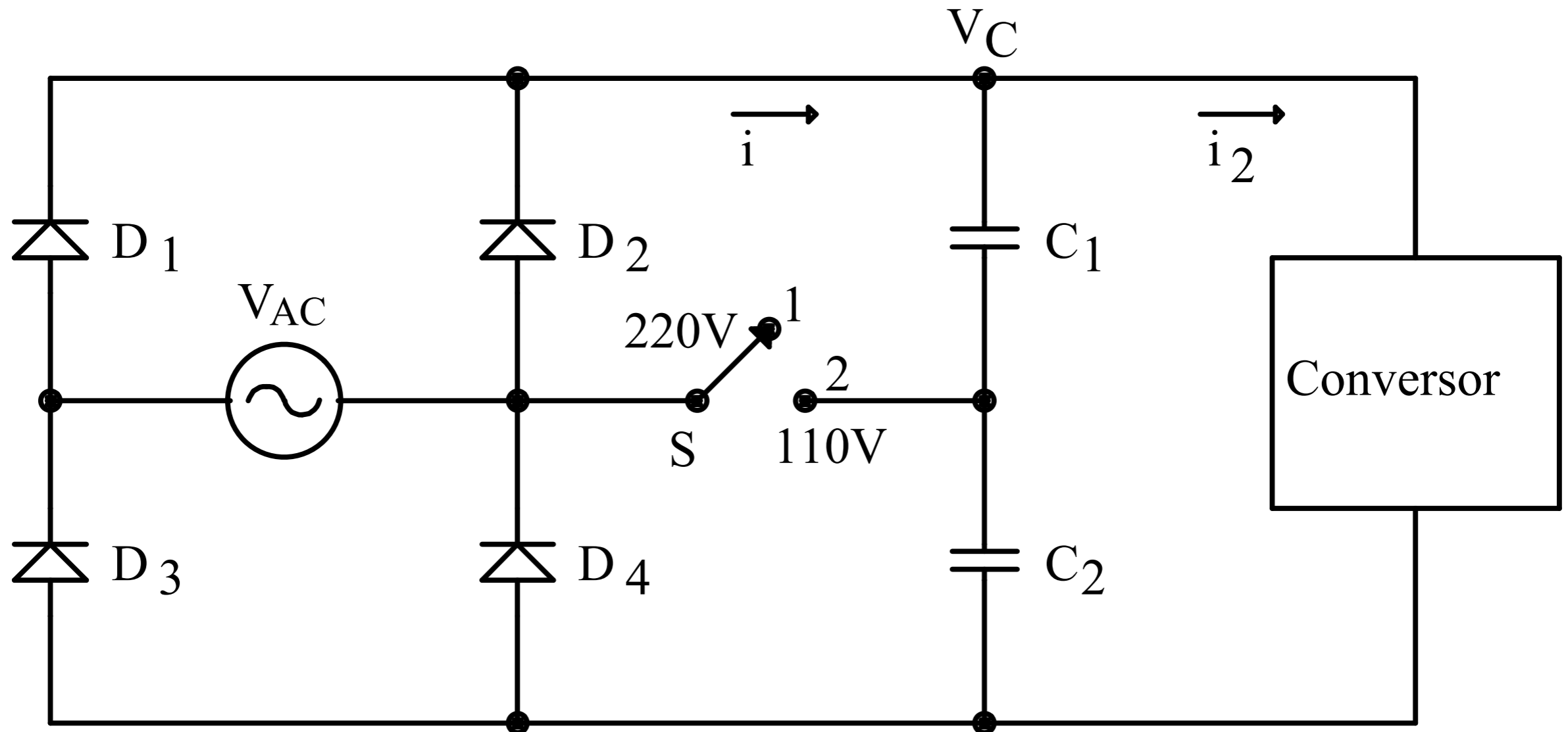
Fontes Chaveadas - Diagrama de Blocos



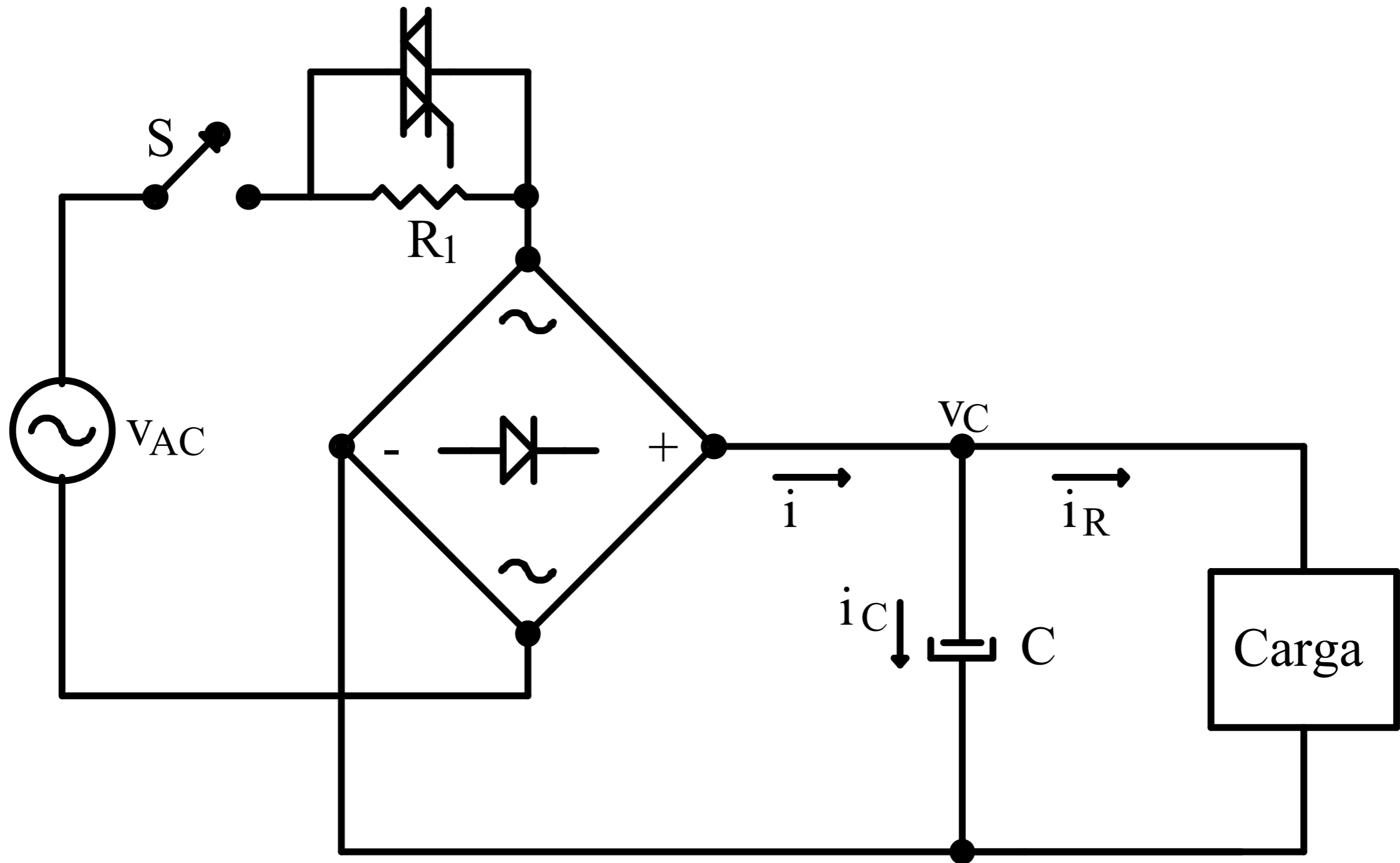
Fontes Chaveadas - Filtro de EMI



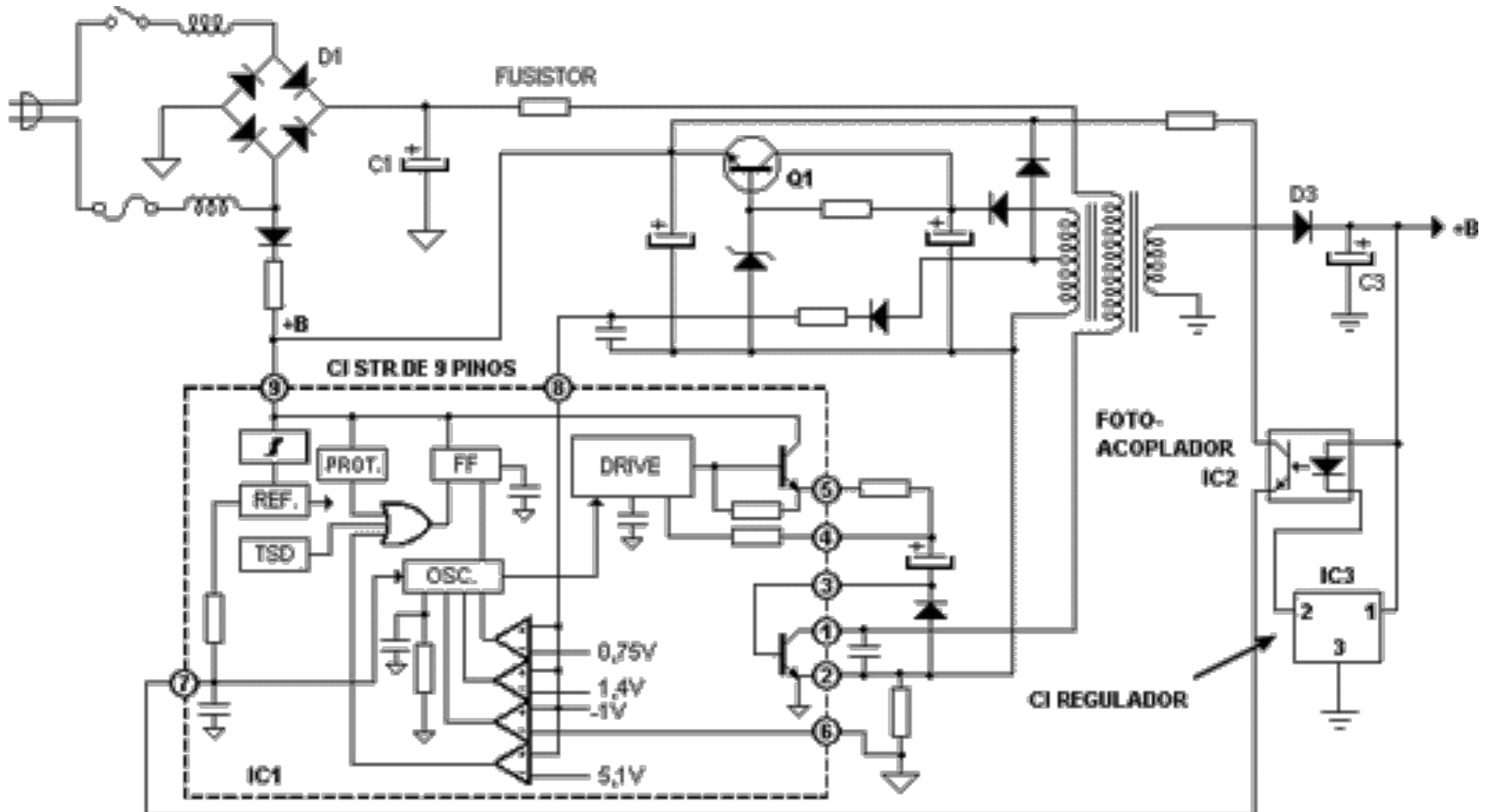
Fontes Chaveadas - Retificador de Entrada

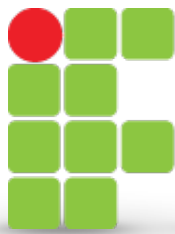


Fontes Chaveadas - Retificador de Entrada

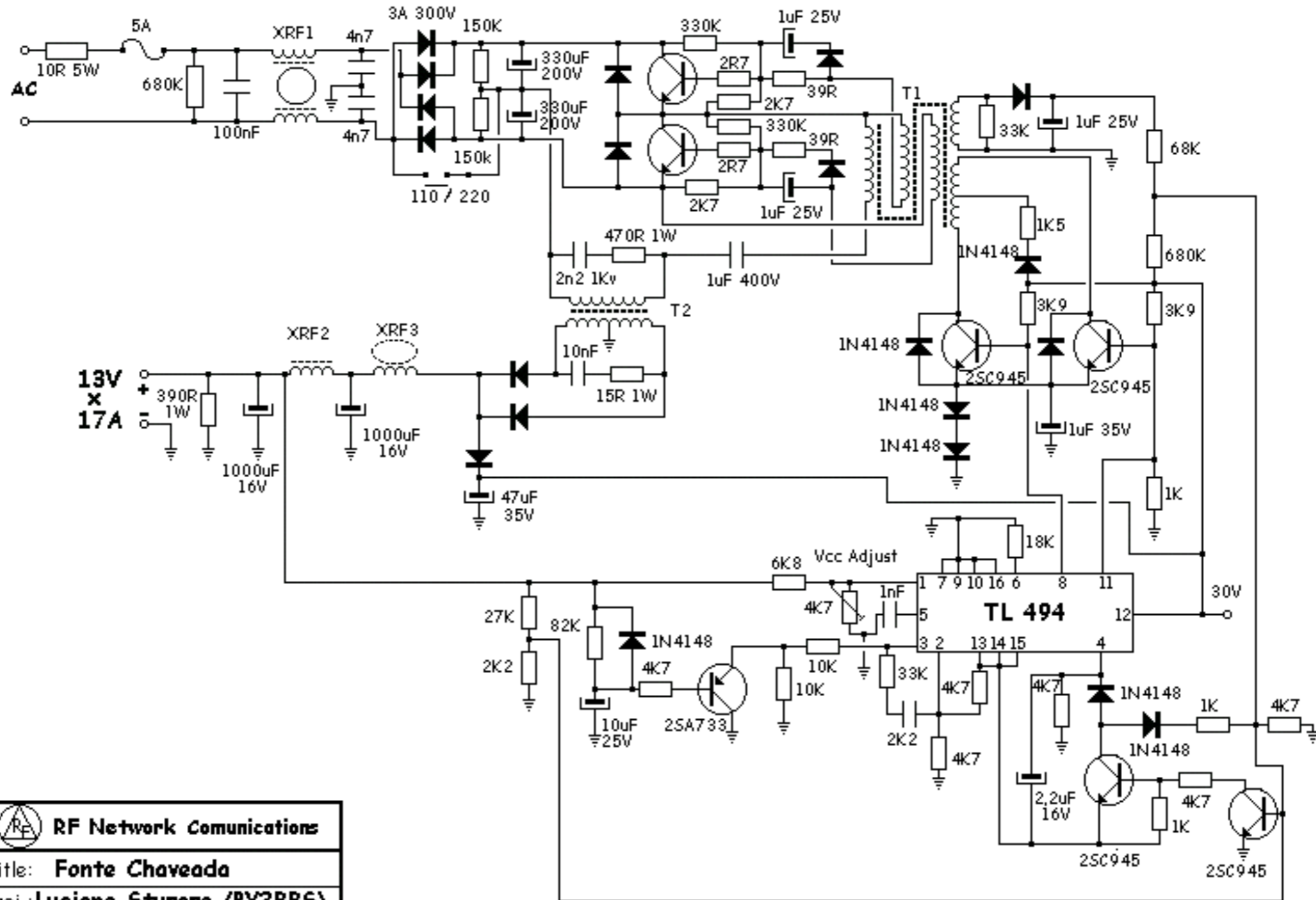




Fontes Chaveadas - Circuitos Elétricos

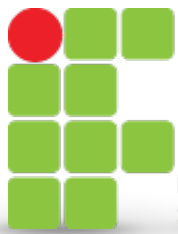




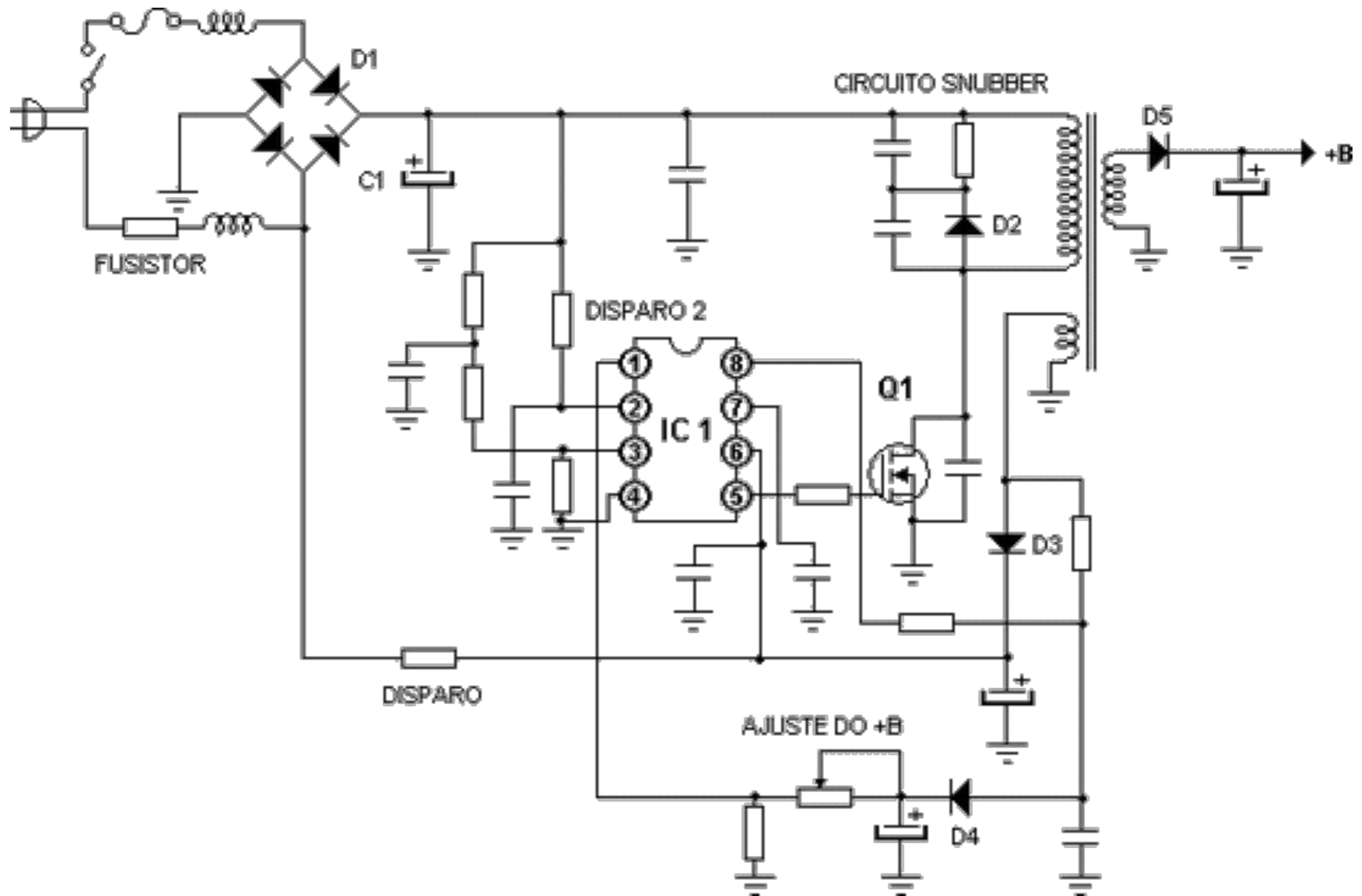
Fontes Chaveadas - Circuitos Elétricos



 RF Network Communications
Title: Fonte Chaveada
Proj.: Luciano Sturaro (PY2BBS)
 Date: 08/01/1999
Rev: B



Fontes Chaveadas - Circuitos Elétricos



FAIRCHILD
SEMICONDUCTOR®

www.fairchildsemi.com

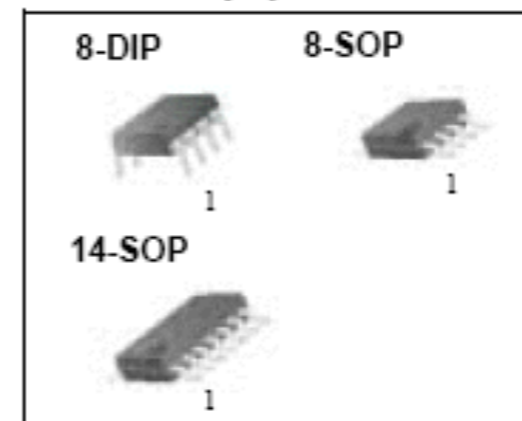
UC3842/UC3843/UC3844/UC3845 SMPS Controller

Features

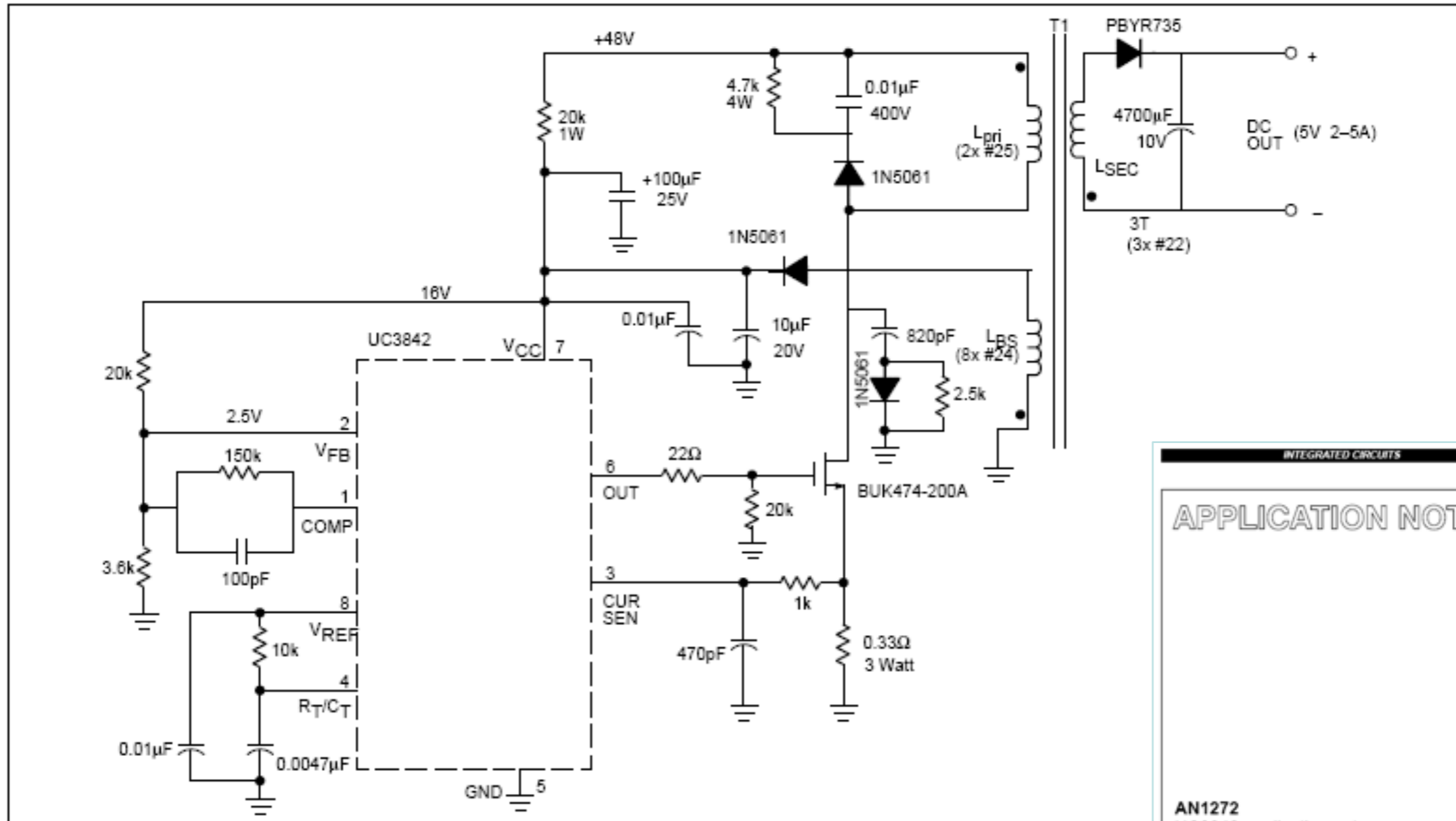
- Low Start up Current
- Maximum Duty Clamp
- UVLO With Hysteresis
- Operating Frequency up to 500KHz

Description

The UC3842/UC3843/UC3844/UC3845 are fixed frequency current-mode PWM controller. They are specially designed for Off-Line and DC to DC converter applications with minimum external components. These integrated circuits feature a trimmed oscillator for precise duty cycle control, a temperature compensated reference, high gain error amplifier, current sensing comparator and a high current totempole output for driving a Power MOSFET. The UC3842 and UC3844 have UVLO thresholds of 16V (on) and 10V (off). The UC3843 and UC3845 are 8.5V(on) and 7.9V (off). The UC3842 and UC3843 can operate within 100% duty cycle. The UC3844 and UC3845 can operate with 50% duty cycle.



Fontes Chaveadas - Circuitos Integrados Dedicados



INTEGRATED CIRCUITS

APPLICATION NOTE

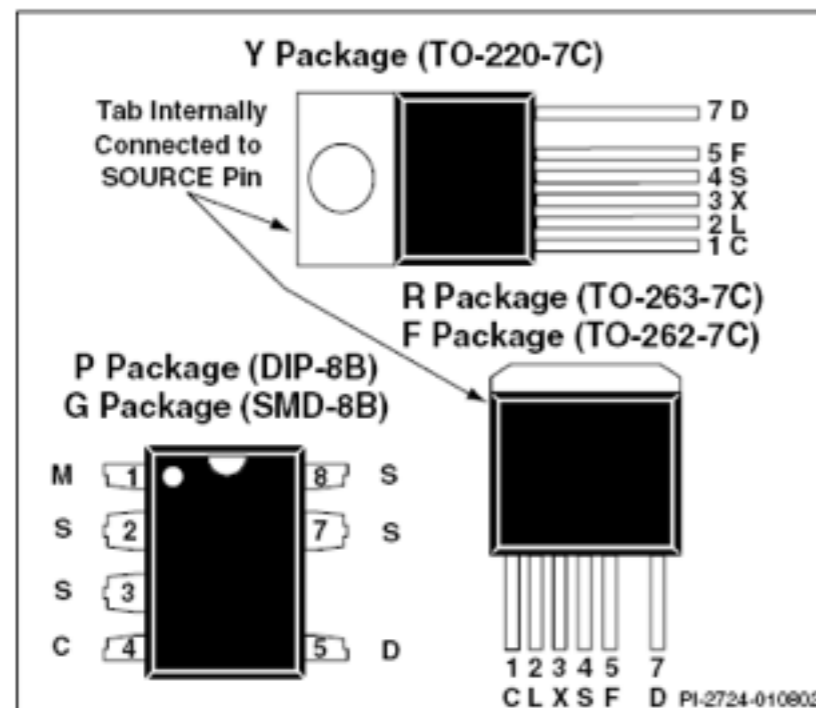
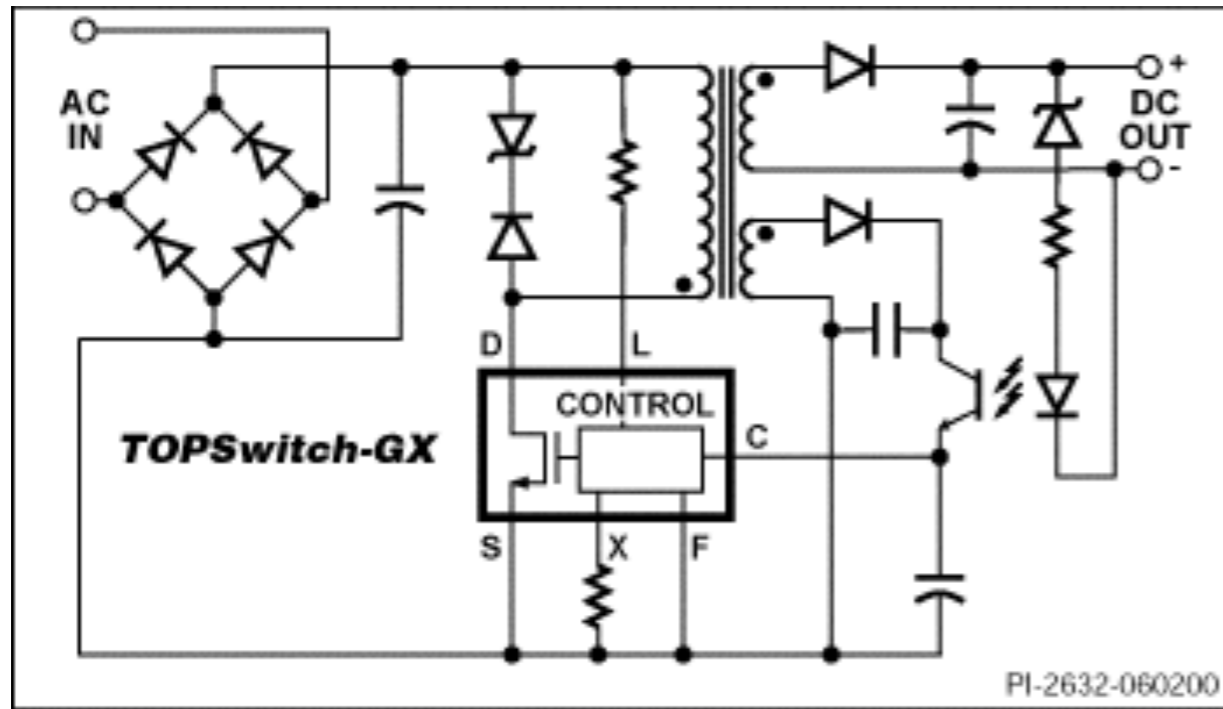
AN1272
UC3842 application note

Author: Lester J. Hadley, Jr. 1991 Dec
Rev 1: 1996 Apr

Philips Semiconductors  **PHILIPS**

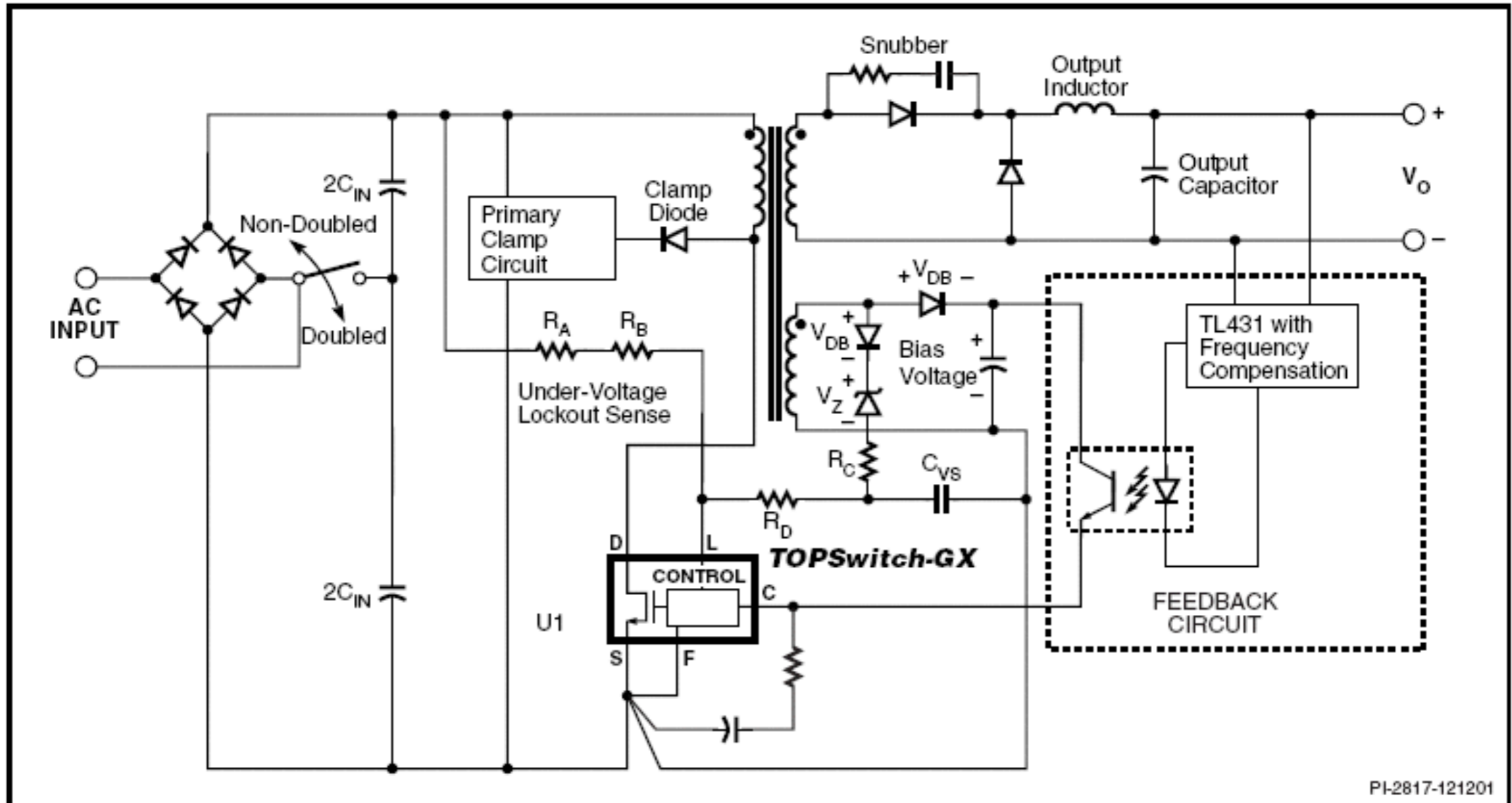
AN1272

Fontes Chaveadas - Circuitos Integrados Dedicados



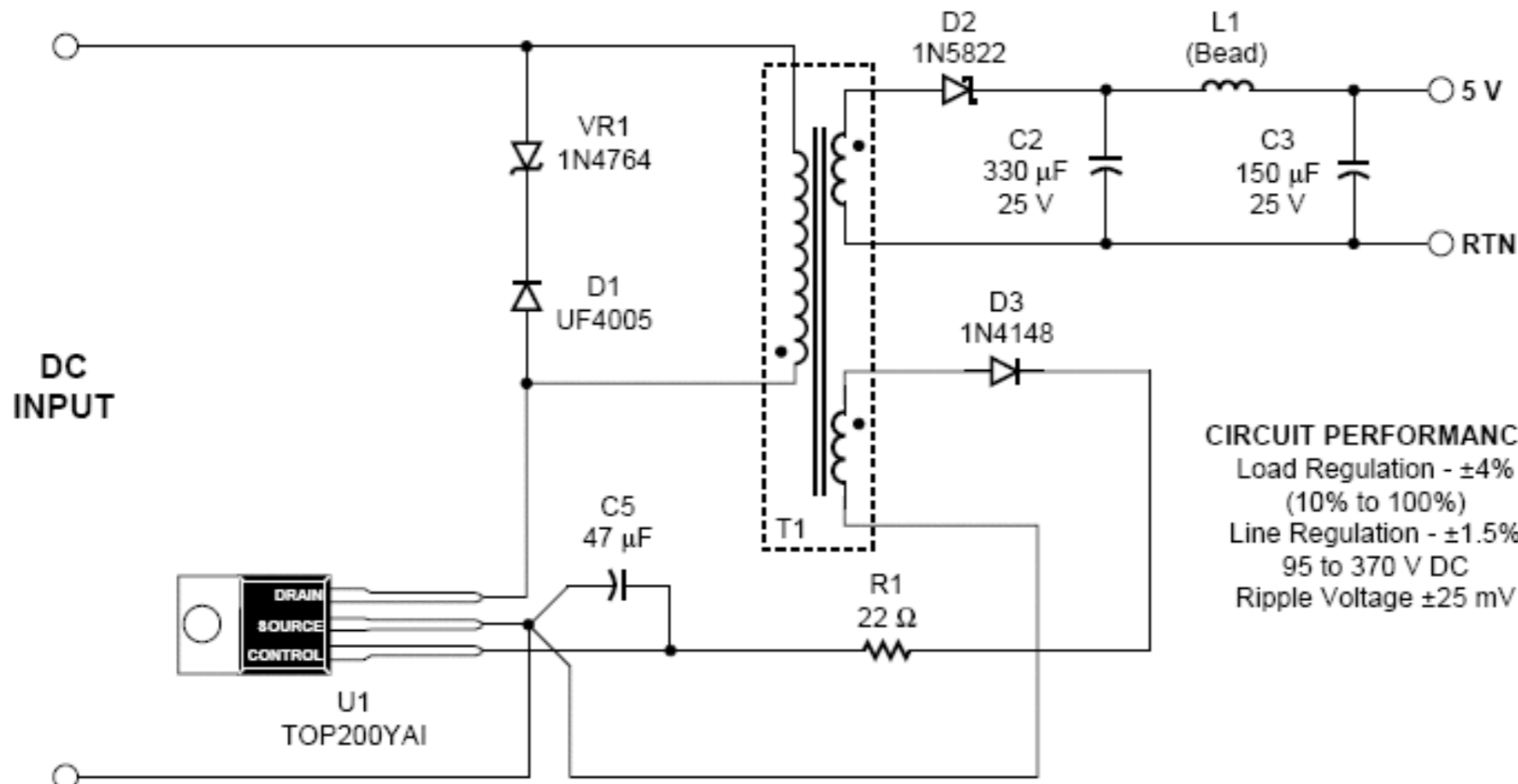
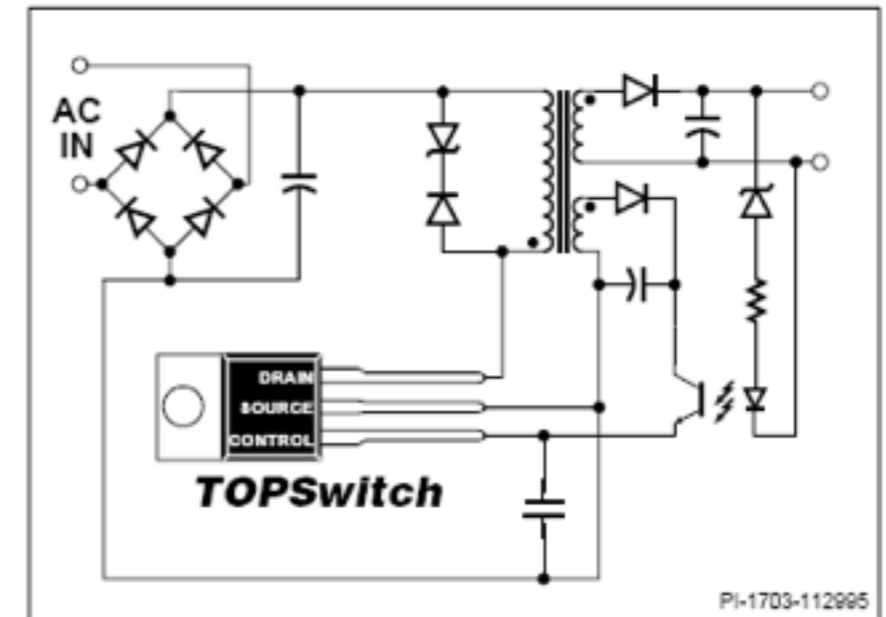
OUTPUT POWER TABLE				
PRODUCT ³	230 VAC $\pm 15\%$ ⁴		85-265 VAC	
	Adapter ¹	Open Frame ²	Adapter ¹	Open Frame ²
TOP242 P or G	9 W	15 W	6.5 W	10 W
TOP242 R	15 W	22 W	11 W	14 W
TOP242 Y or F	10 W	22 W	7 W	14 W
TOP243 P or G	13 W	25 W	9 W	15 W
TOP243 R	29 W	45 W	17 W	23 W
TOP243 Y or F	20 W	45 W	15 W	30 W
TOP244 P or G	16 W	28 W	11 W	20 W
TOP244 R	34 W	50 W	20 W	28 W
TOP244 Y or F	30 W	65 W	20 W	45 W
TOP245 P or G	19 W	30 W	13 W	22 W
TOP245 R	37 W	57 W	23 W	33 W
TOP245 Y or F	40 W	85 W	26 W	60 W
TOP246 P or G	21 W	34 W	15 W	26 W
TOP246 R	40 W	64 W	26 W	38 W
TOP246 Y or F	60 W	125 W	40 W	90 W
TOP247 R	42 W	70 W	28 W	43 W
TOP247 Y or F	85 W	165 W	55 W	125 W
TOP248 R	43 W	75 W	30 W	48 W
TOP248 Y or F	105 W	205 W	70 W	155 W
TOP249 R	44 W	79 W	31 W	53 W
TOP249 Y or F	120 W	250 W	80 W	180 W
TOP250 R	45 W	82 W	32 W	55 W
TOP250 Y or F	135 W	290 W	90 W	210 W

Fontes Chaveadas - Circuitos Integrados Dedicados



PI-2817-121201

TOP200-4/14 **TOPSwitch**[®] Family Three-terminal Off-line PWM Switch



CIRCUIT PERFORMANCE:
Load Regulation - ±4%
(10% to 100%)
Line Regulation - ±1.5%
95 to 370 V DC
Ripple Voltage ±25 mV

Conversores cc-cc:

- Conversores integrados.

