Energía y Telecomunicaciones

Tema 5.3. Fuentes de alimentación

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Fuentes de alimentación

Lineal vs Conmutada

- **Fuente Lineal:**

  Trabajan a la frecuencia de red (o al doble de ésta), por lo que los componentes pasivos que incorporan (bobinas y condensadores) son grandes.

Sencillas

Rendimiento bajo

No radian ruido

Pesadas y voluminosas

- **Fuente Conmutada:**

  Trabajan a frecuencias elevadas (decenas o cientos de kilohertzios), lo que permite usar bobinas y condensadores pequeños.

Complejas

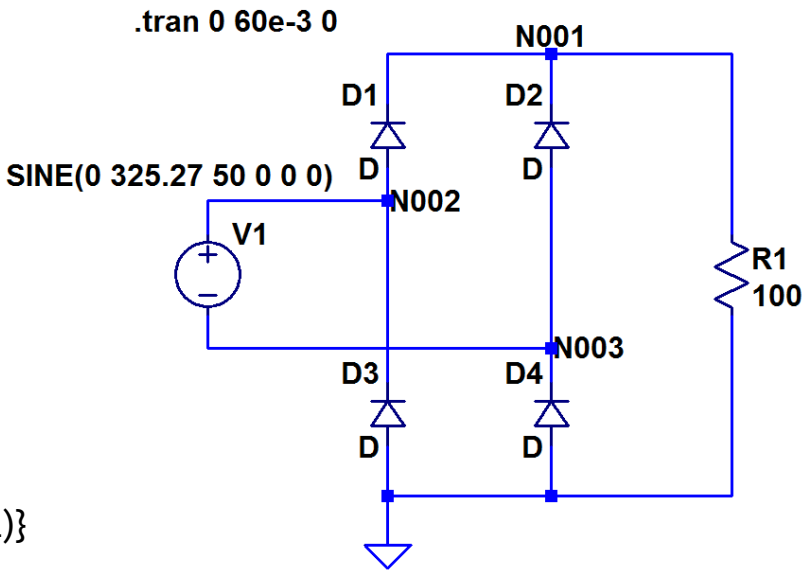
Alto rendimiento

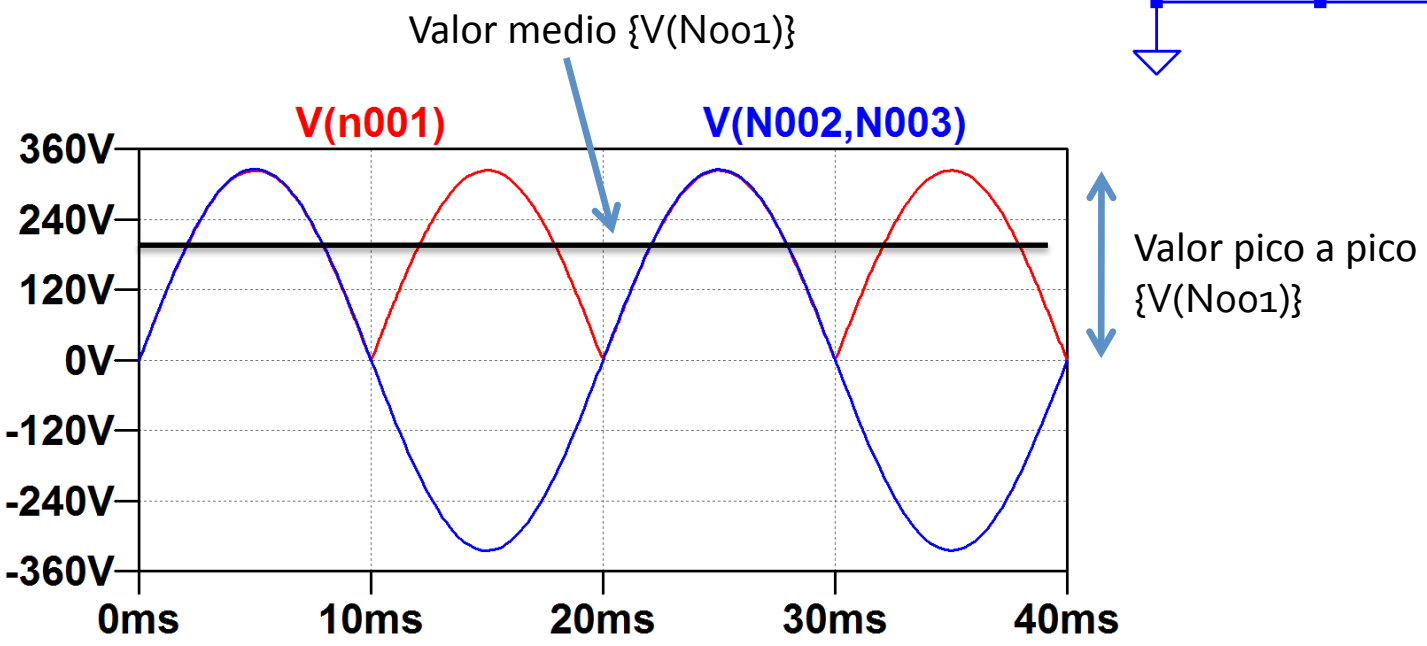
Ruidosas

Pequeñas y ligeras

Factor de ondulación

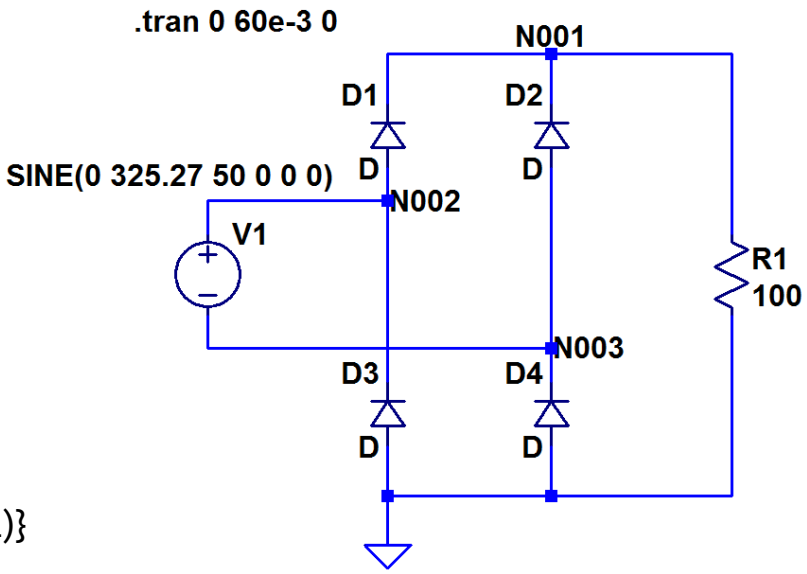
$$f_0 = \frac{U_{max} - U_{min}}{2U_m}$$

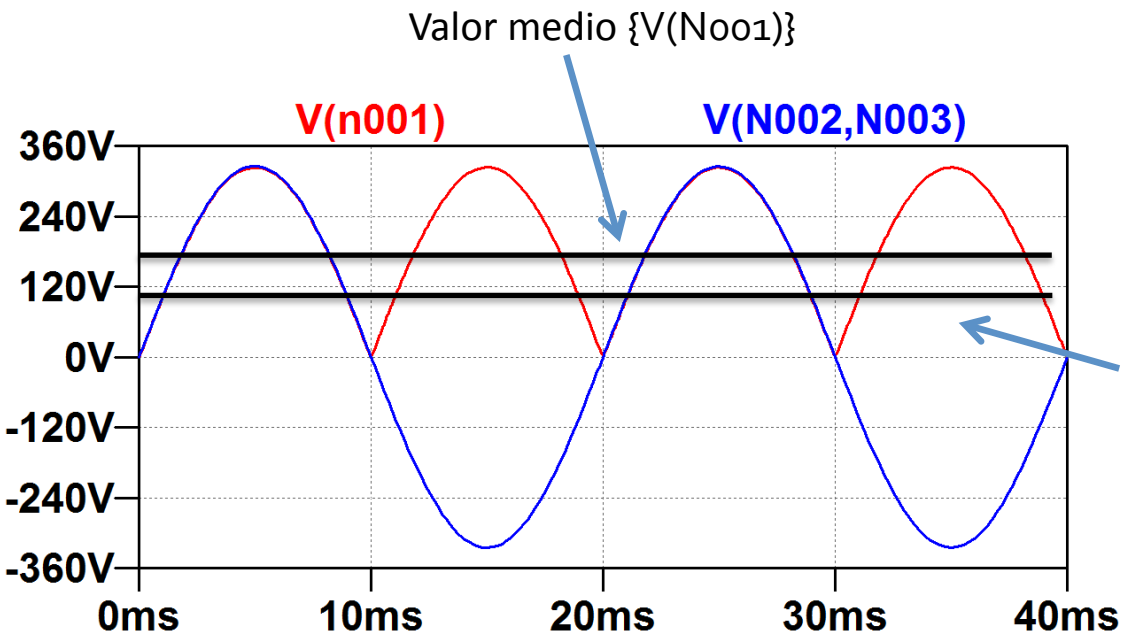




Factor de rizado

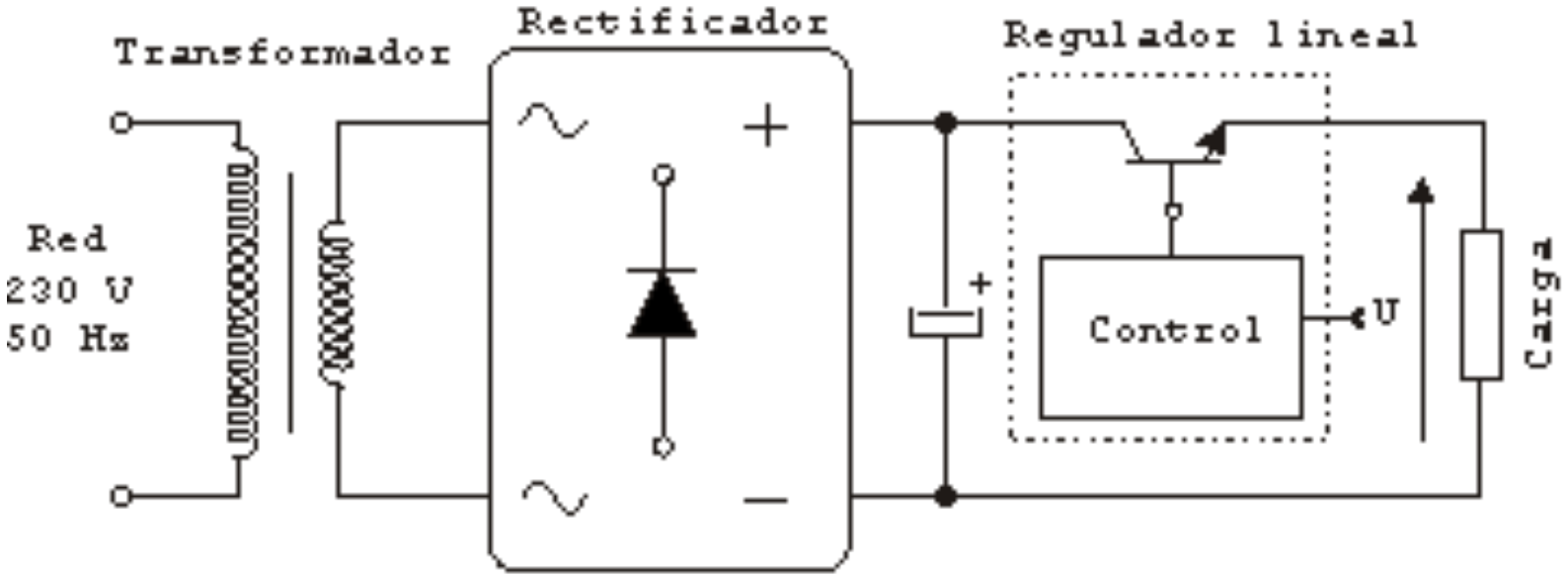
$$f_r = \frac{U_{rms,componente\ de\ alterna}}{U_m}$$





Valor eficaz componente de alterna {V(Noo1)}

Fuente de alimentación lineal con regulador disipativo



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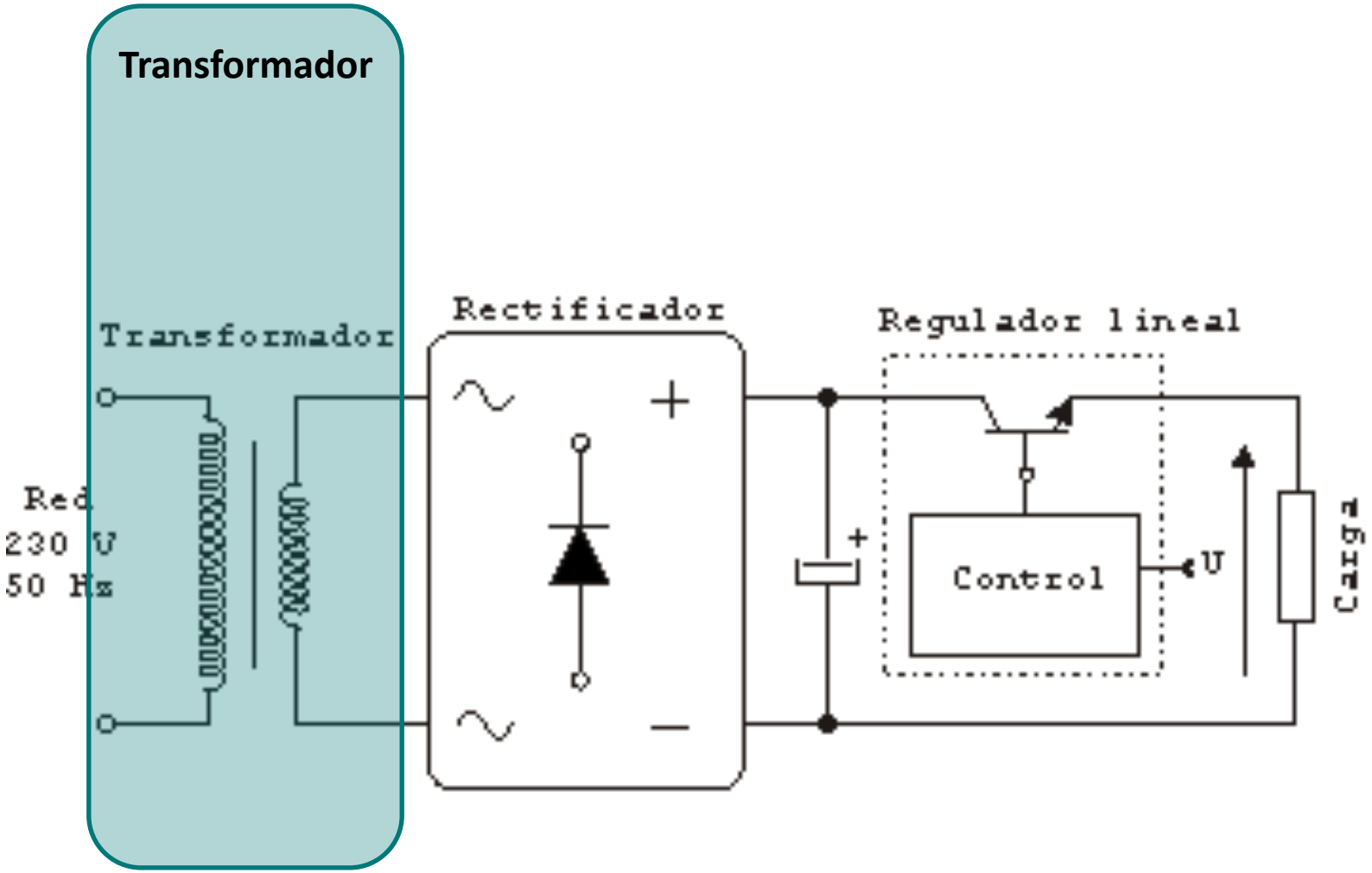

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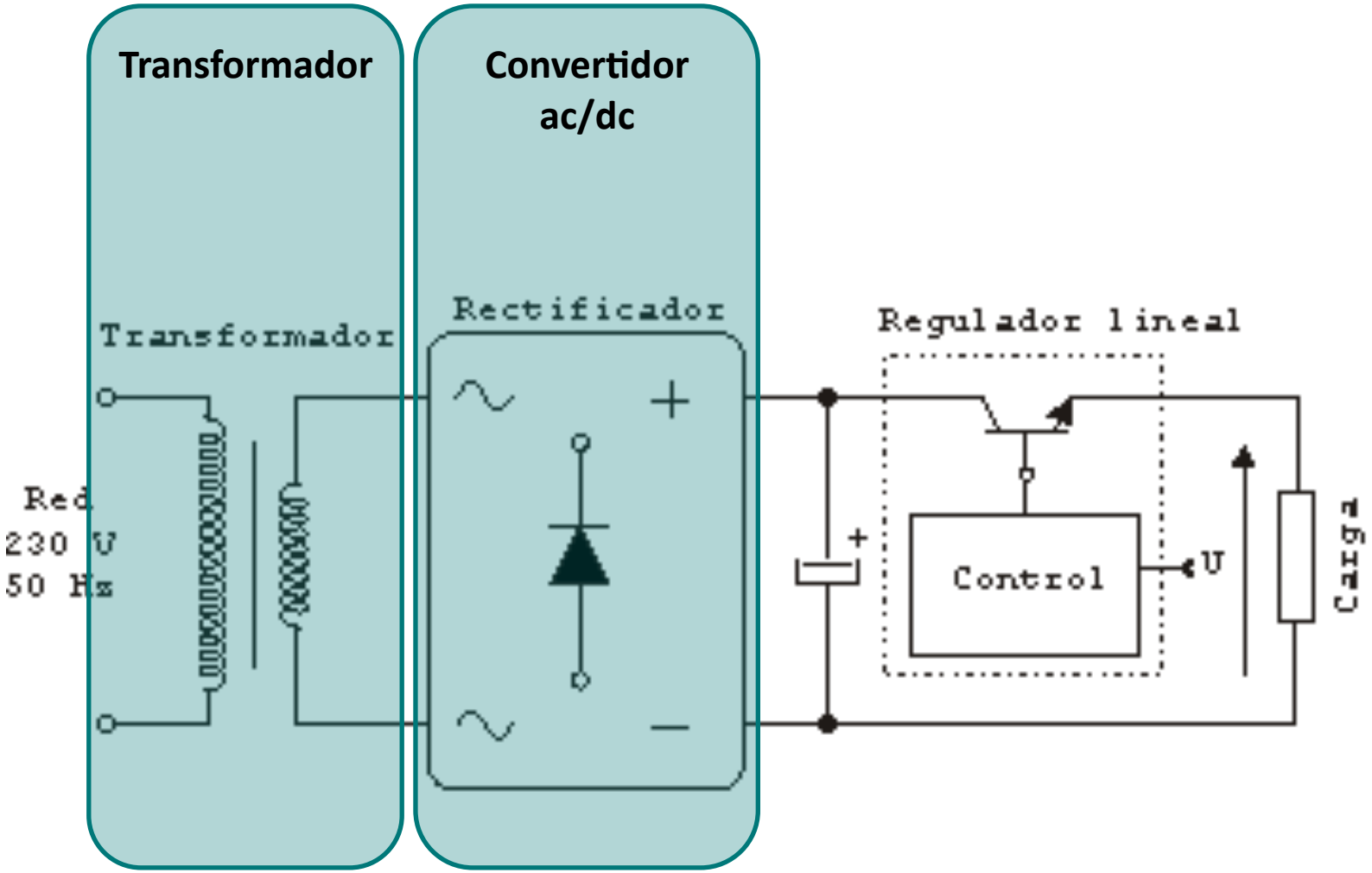
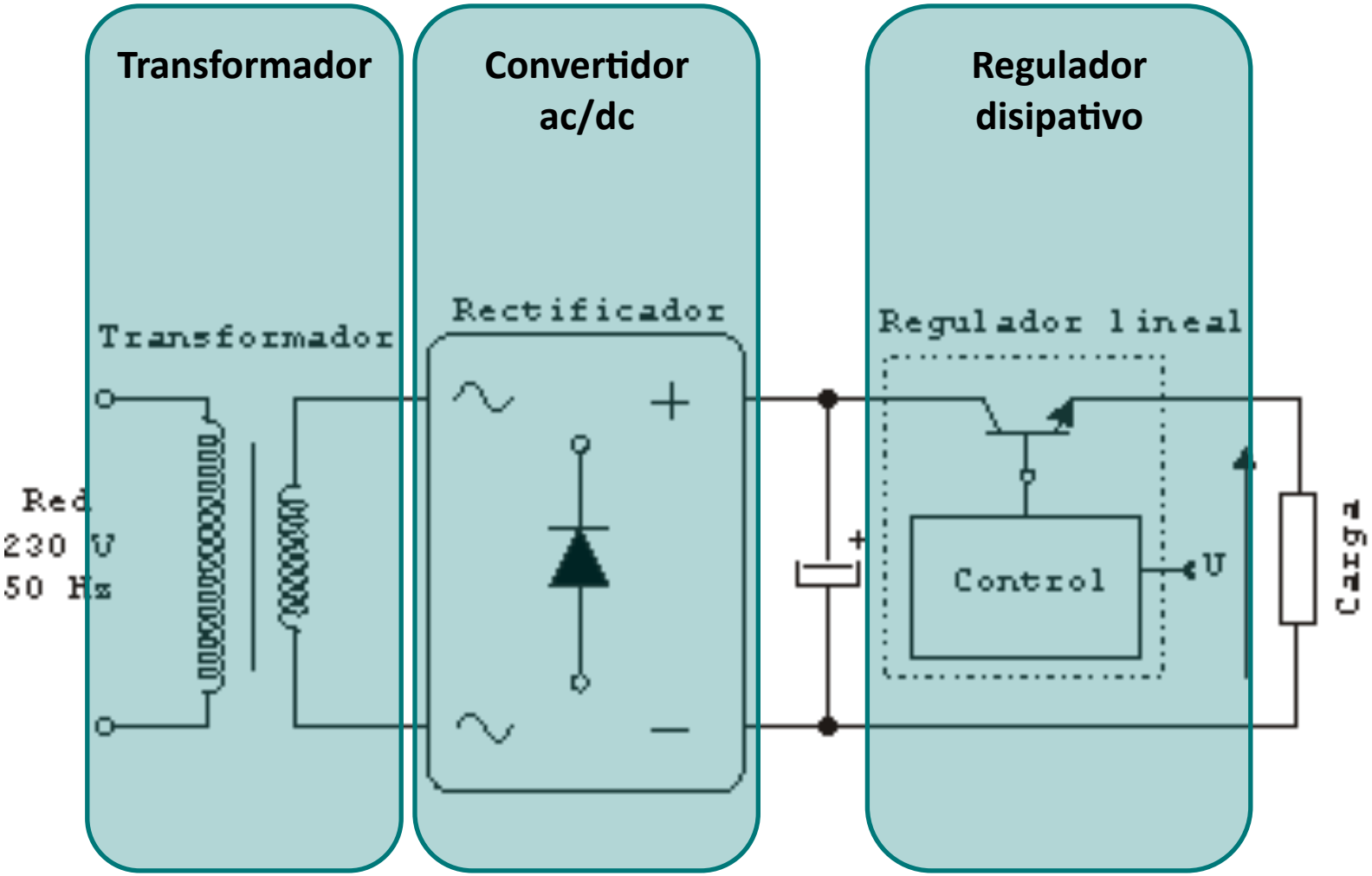


Fuente de alimentación lineal con regulador disipativo



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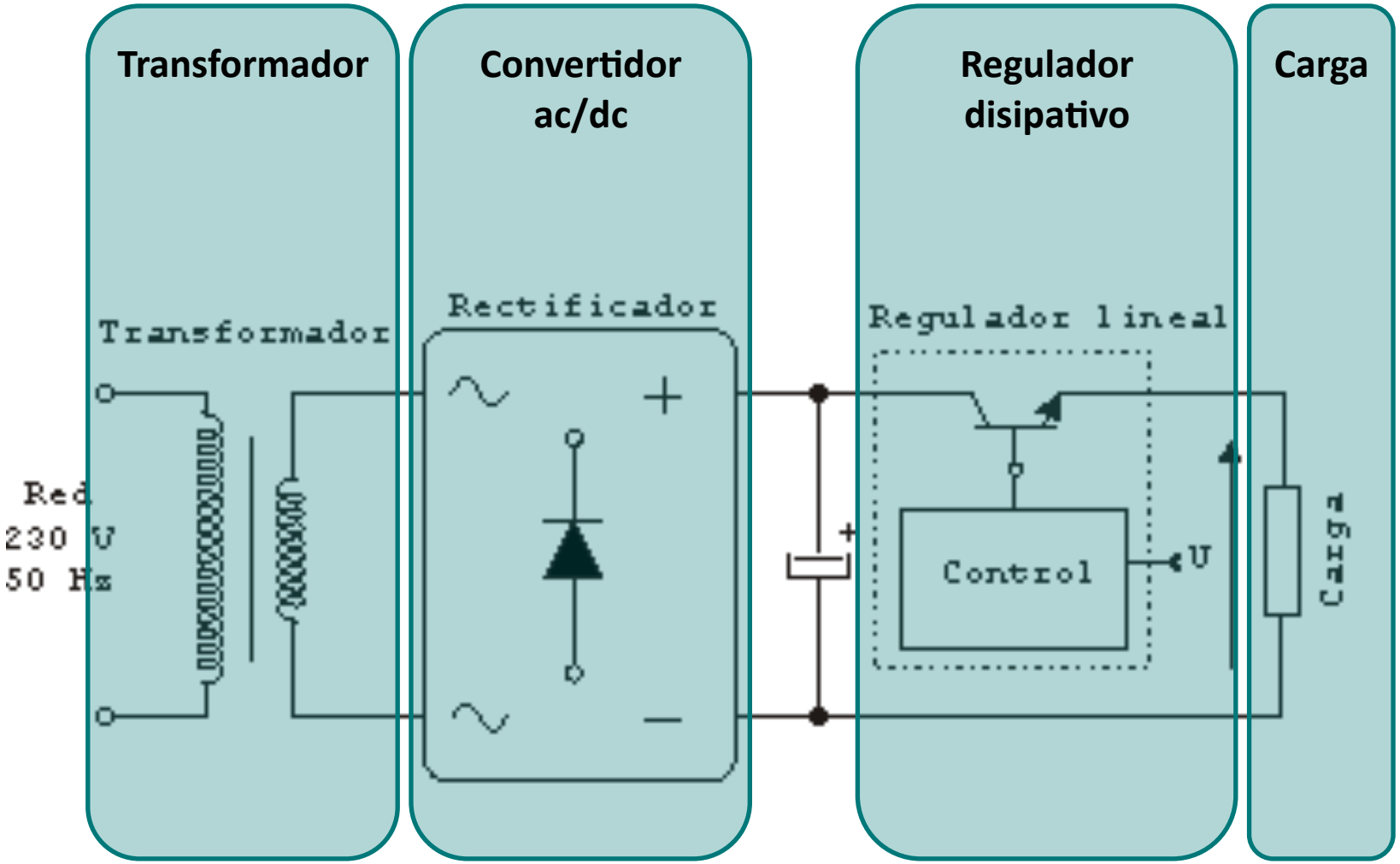
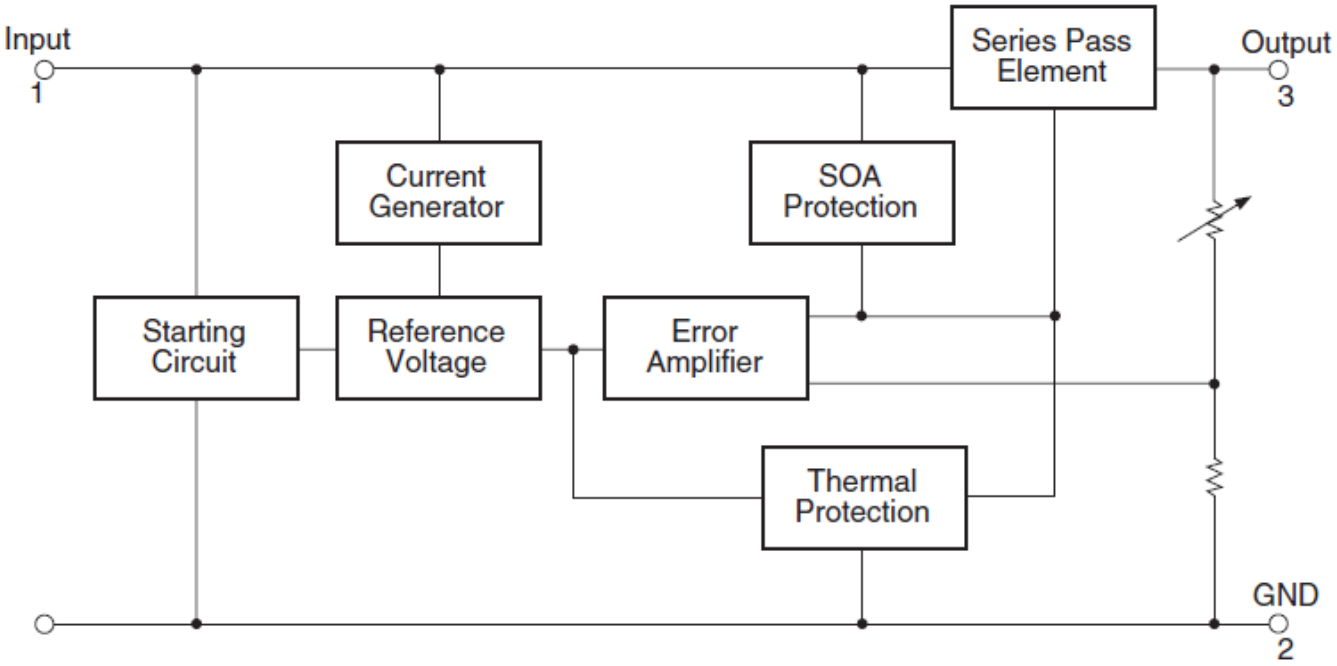
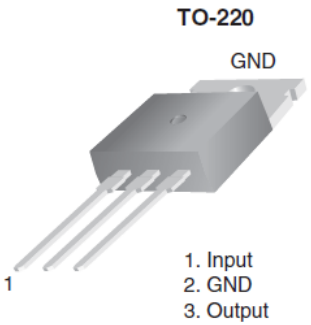


Fuente de alimentación con regulador disipativo

Serie 78XX

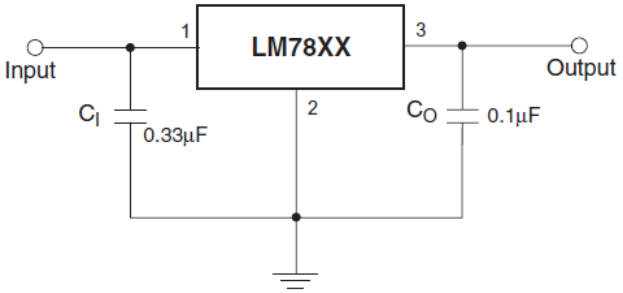


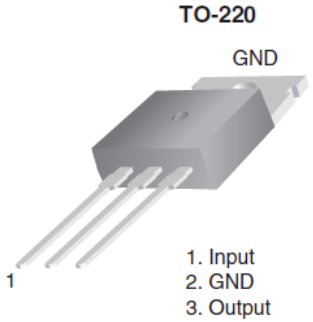


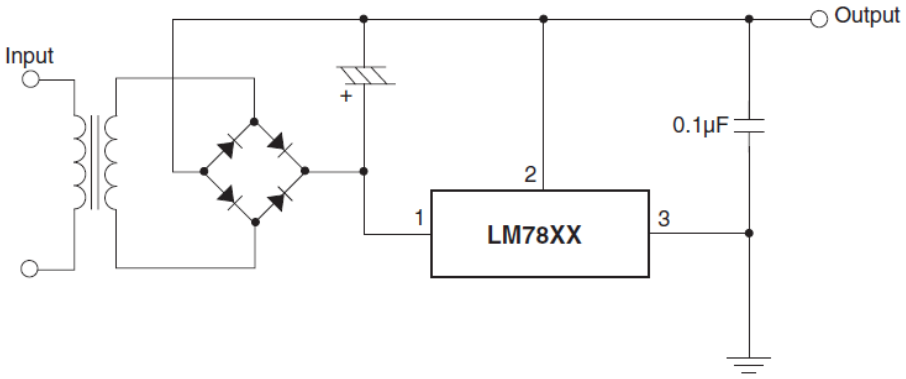
Columna	7803	7805	7806	7808	7809	7810	7812	7815	7818	7824
V_{out}	3,3V	5V	6V	8V	9V	10V	12V	15V	18V	24V
$V_{in} - V_{out}$		2,2V - 30V					2,5V - 23V	2,6V - 20V		
Temperatura de operación	0 - 125 °C	0 - 125 °C		0 - 125 °C	0 - 125 °C			0 - 125 °C		
I_{max} de salida	1A	1A	1A	1A	1A	1A	1A	1A	1A	1A

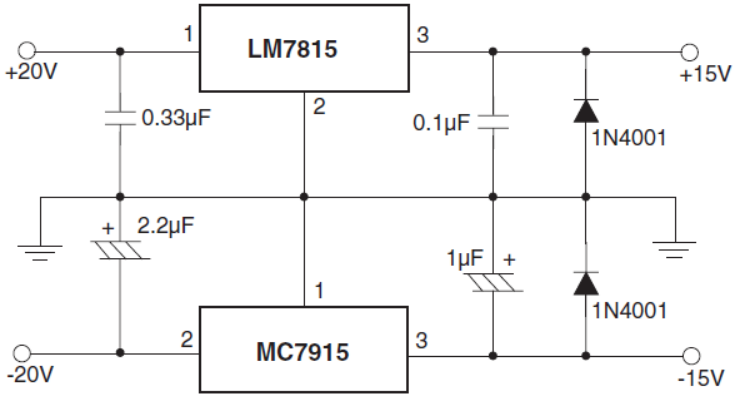
Fuente de alimentación con regulador disipativo

Serie 78XX

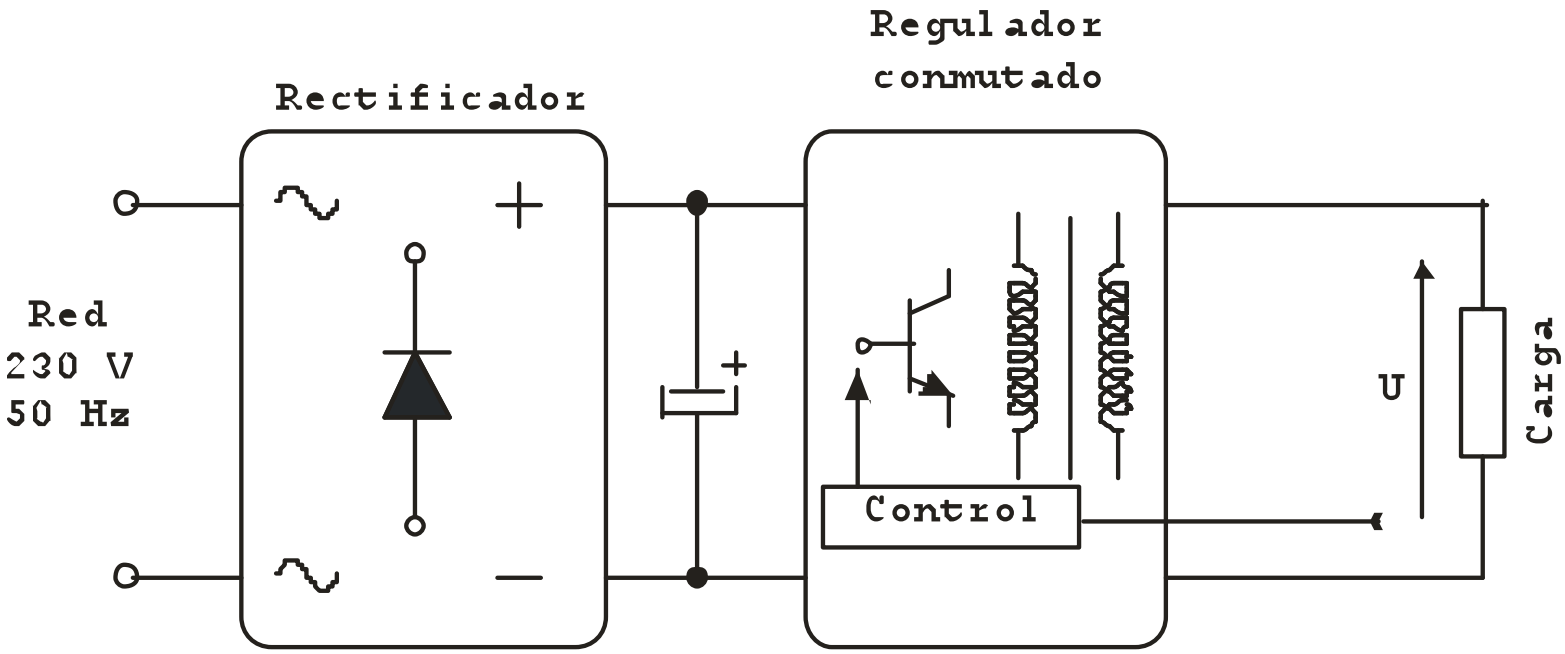




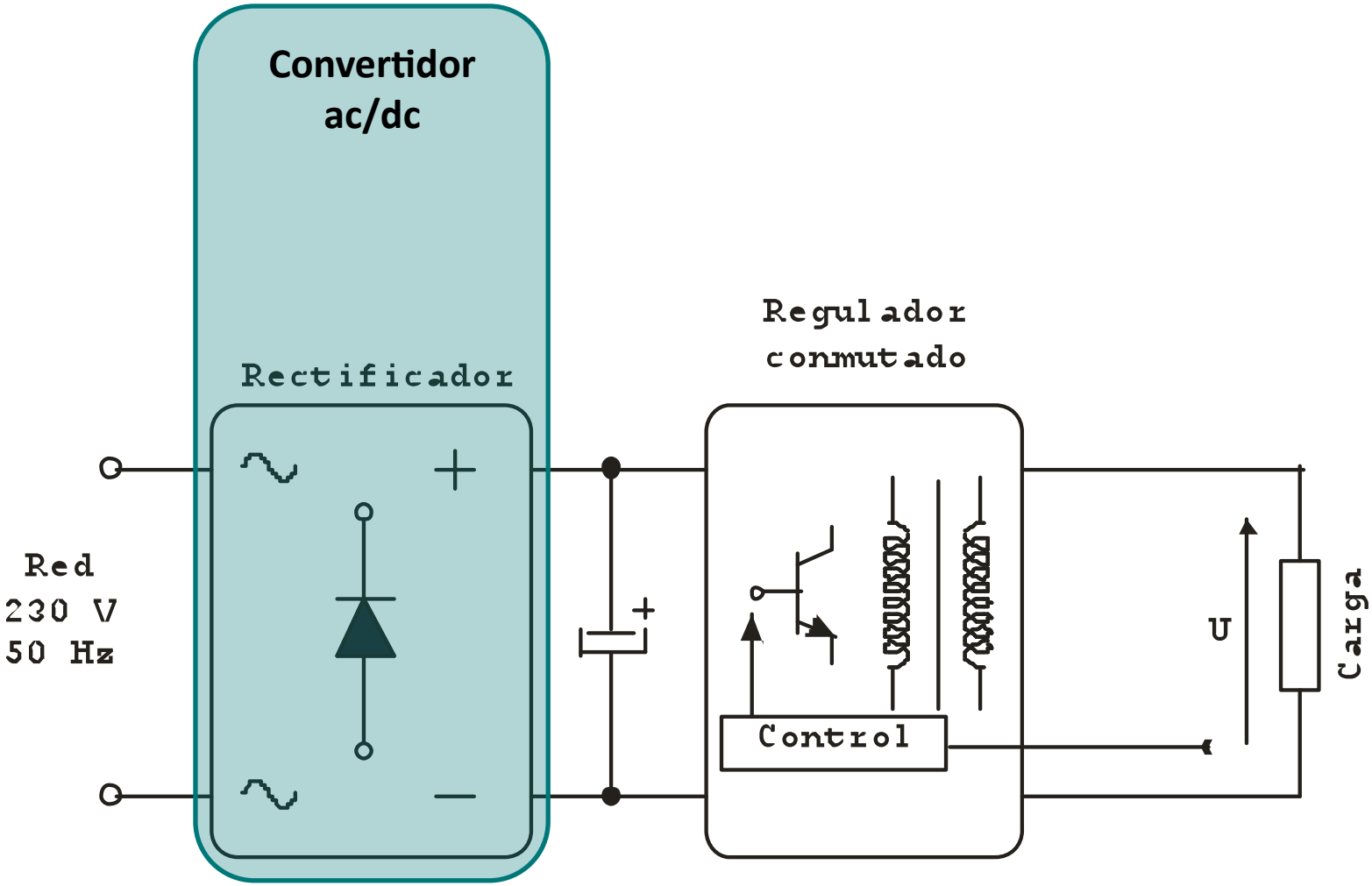




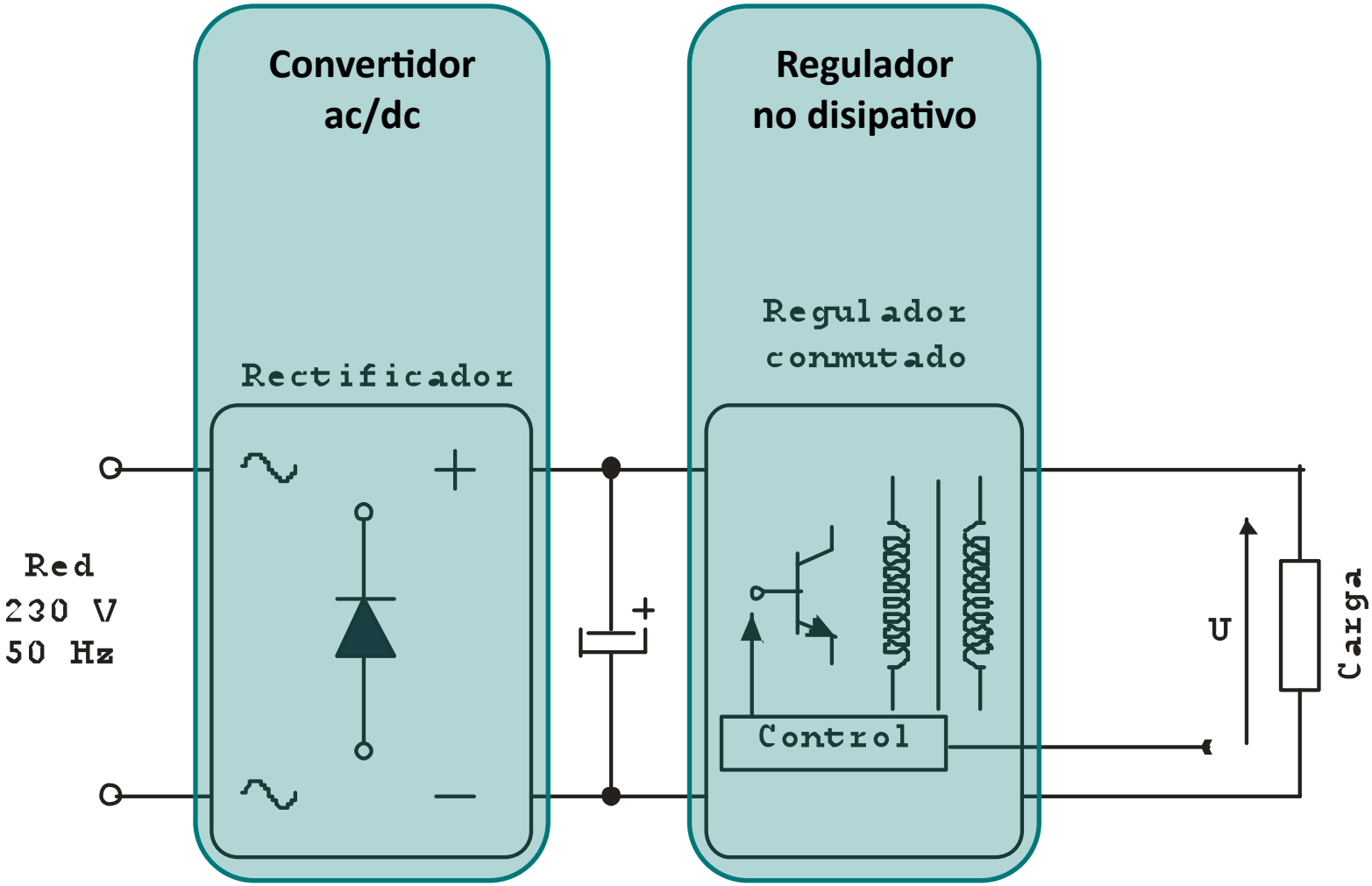
Fuente de alimentación con regulador no disipativo



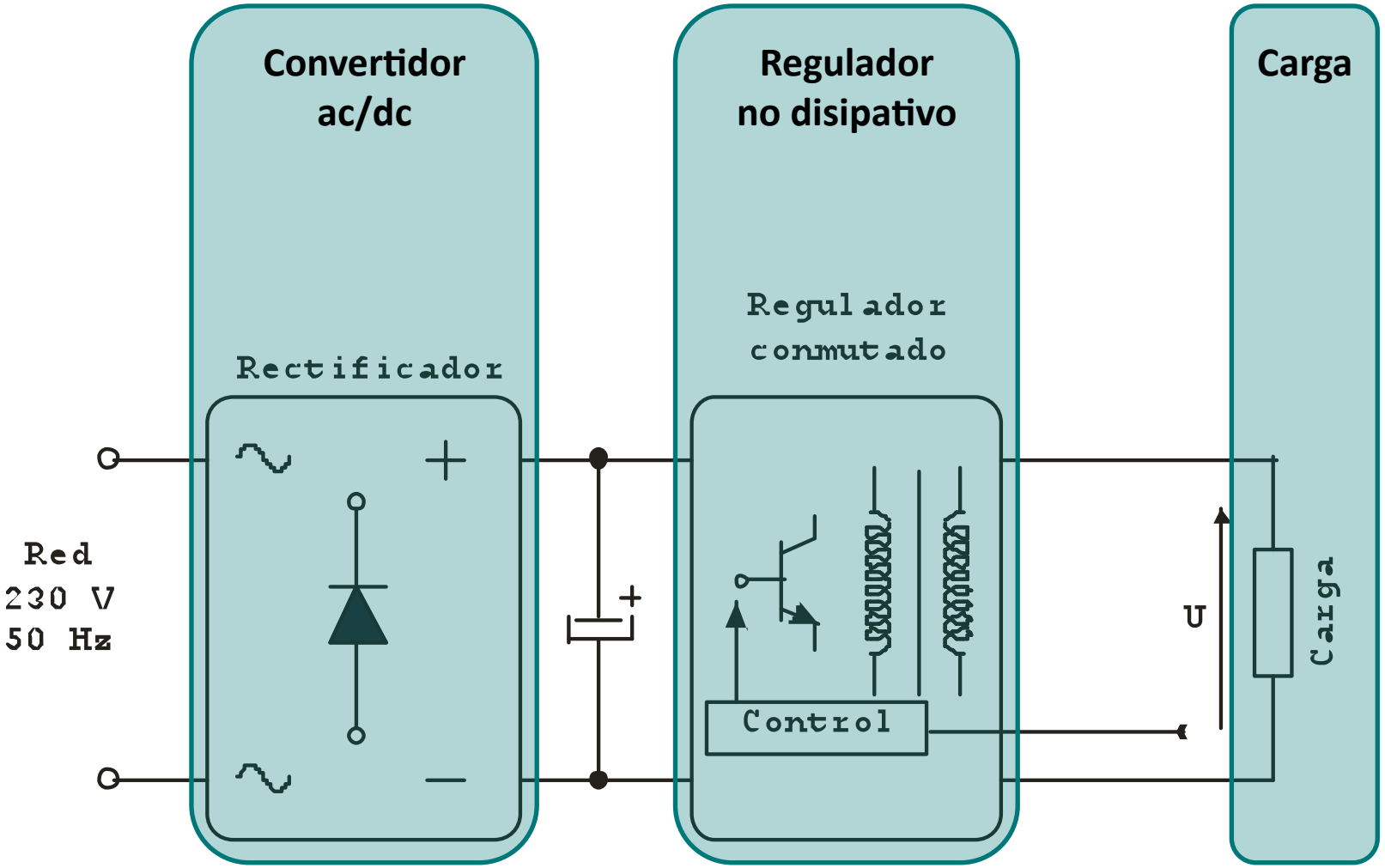
Fuente de alimentación con regulador no disipativo



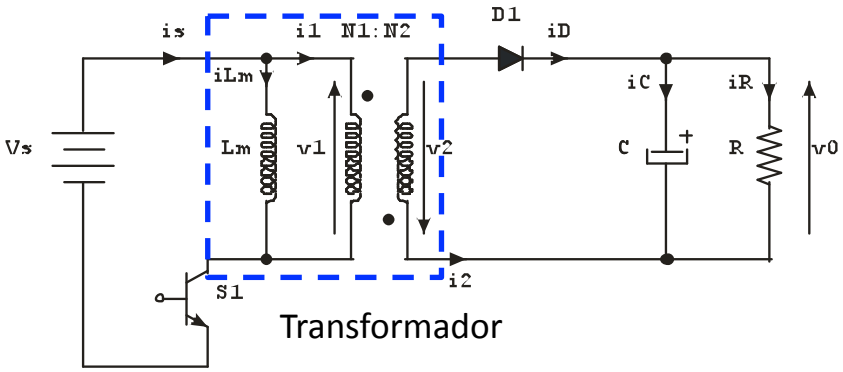
Fuente de alimentación con regulador no disipativo



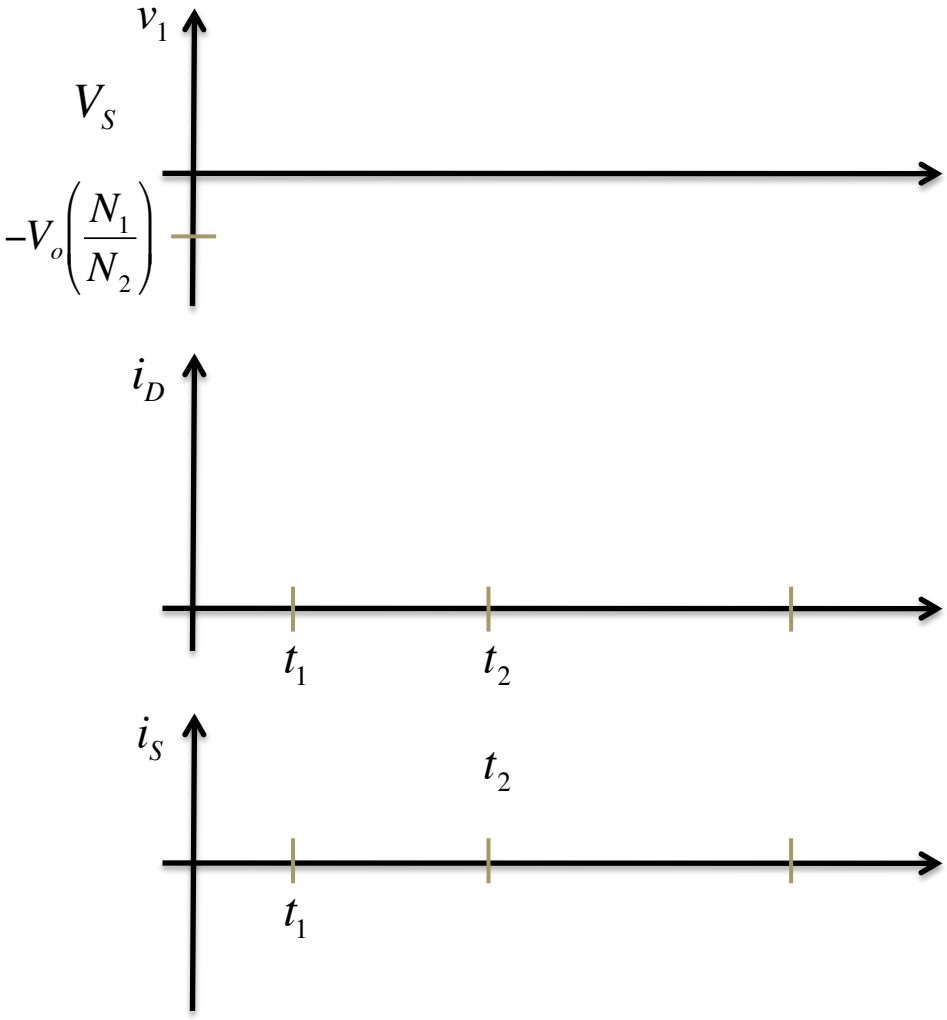
Fuente de alimentación con regulador no disipativo



Convertidor Flyback



Transformador



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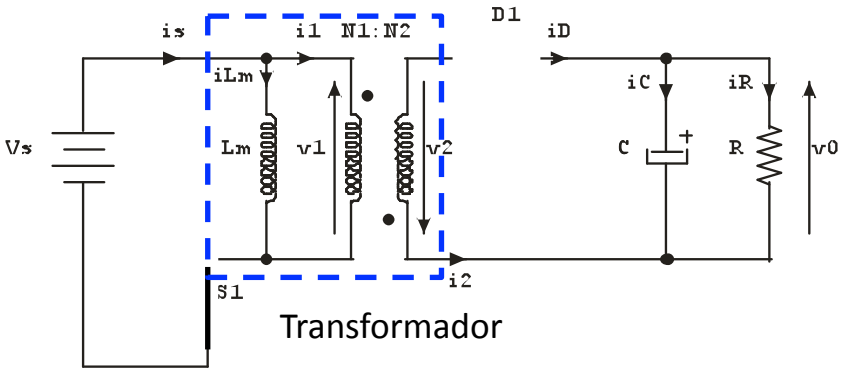
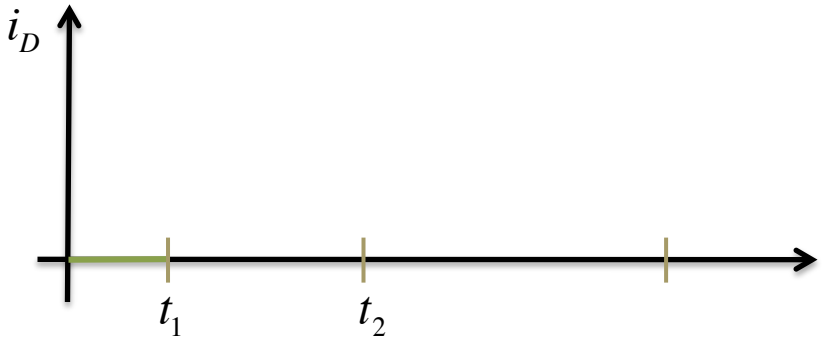
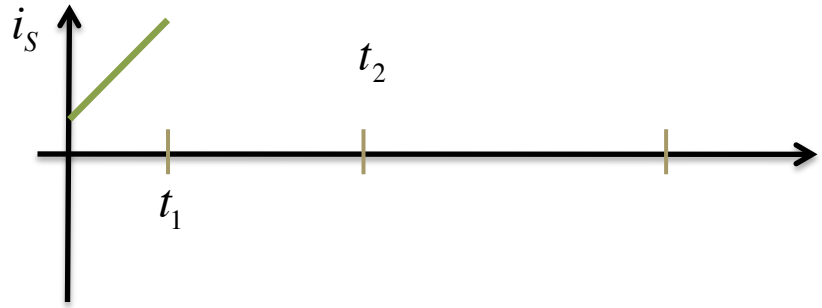


Transformador

S1 on

$$v_1 = V_S = L_m \frac{di_{L_m}}{dt} \qquad v_2 = v_1\left(\frac{N_2}{N_1}\right)$$





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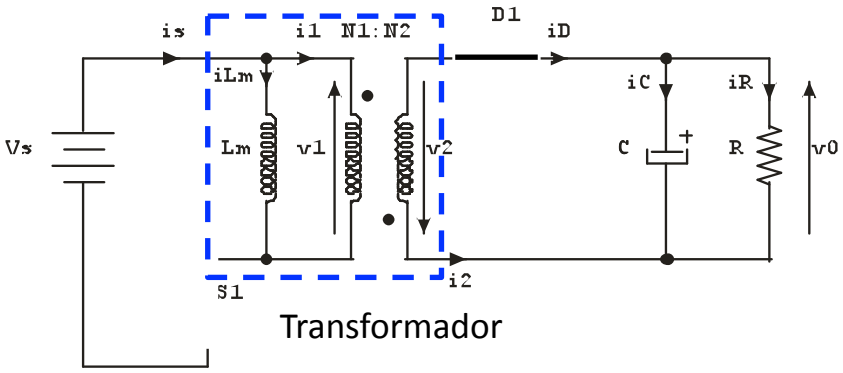

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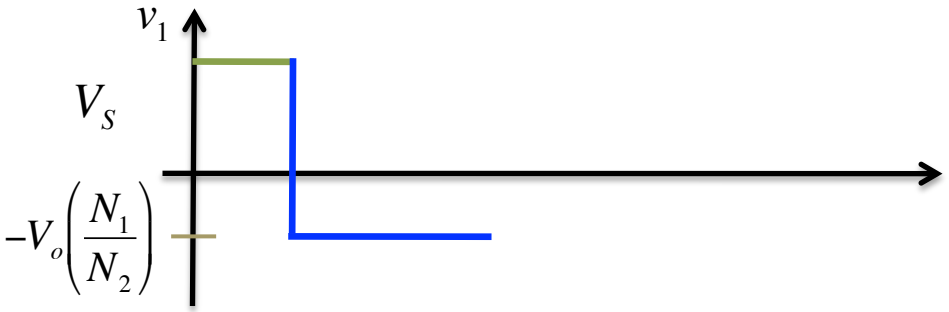

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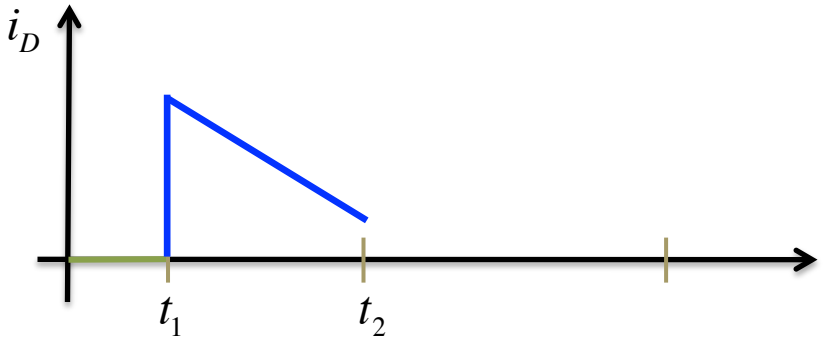

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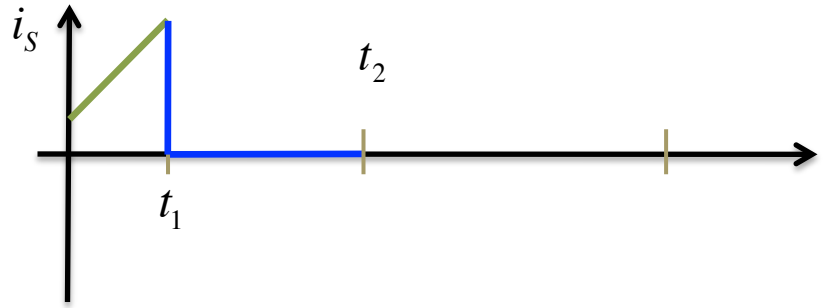

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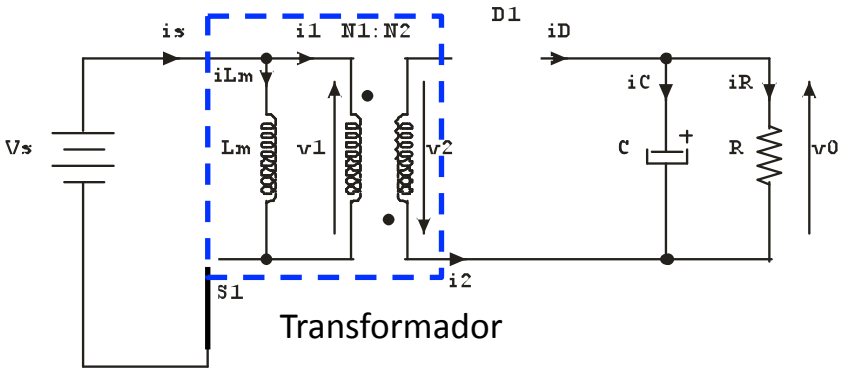

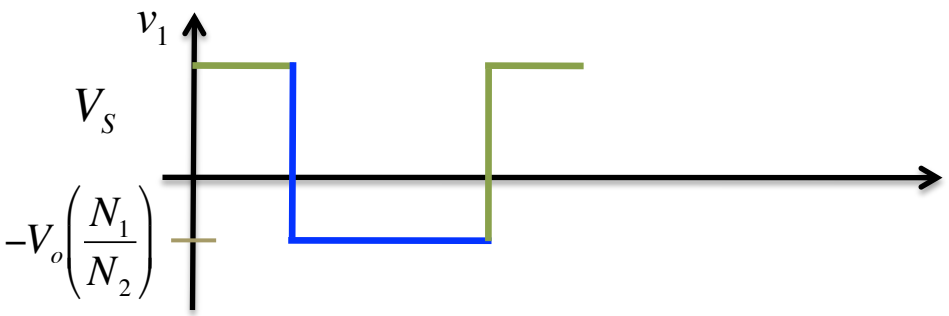

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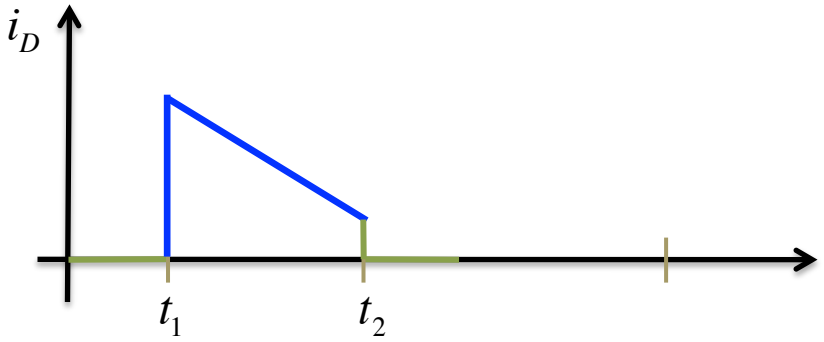

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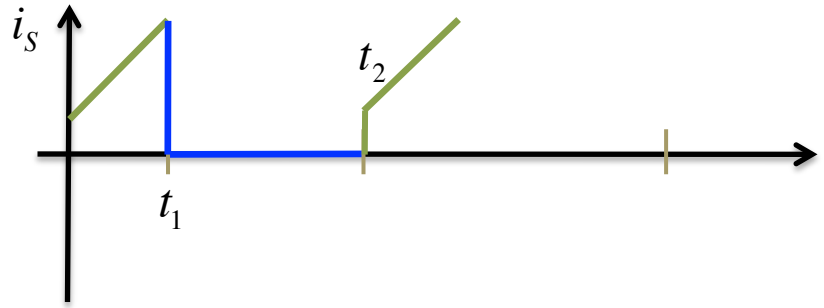

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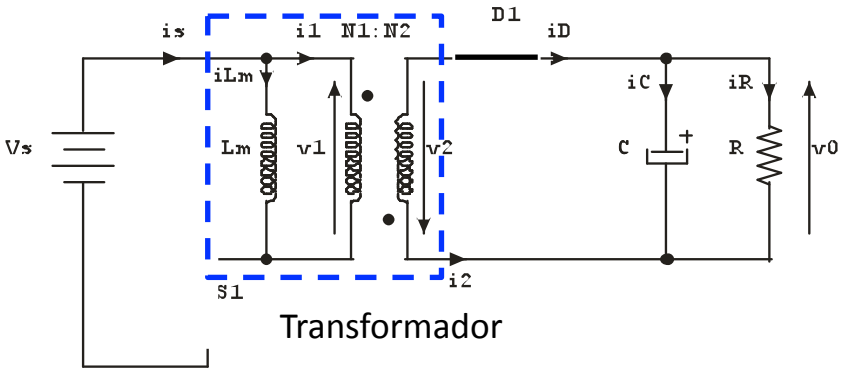

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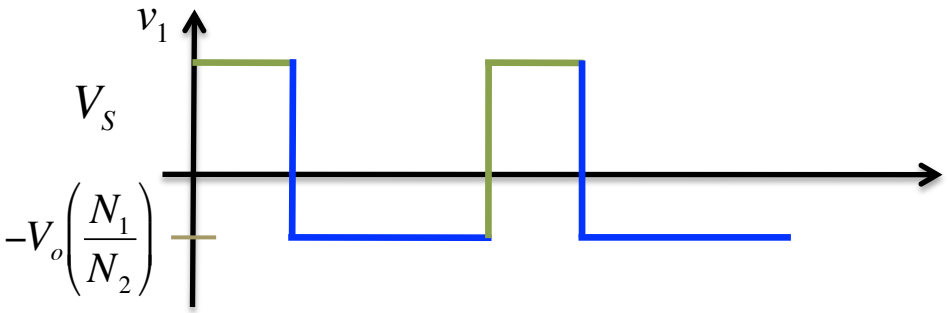

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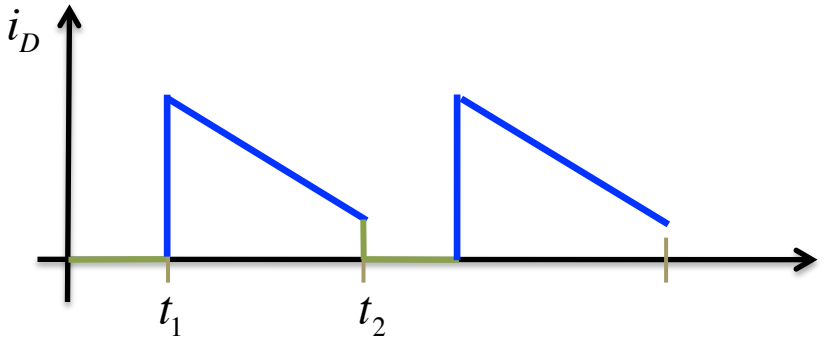

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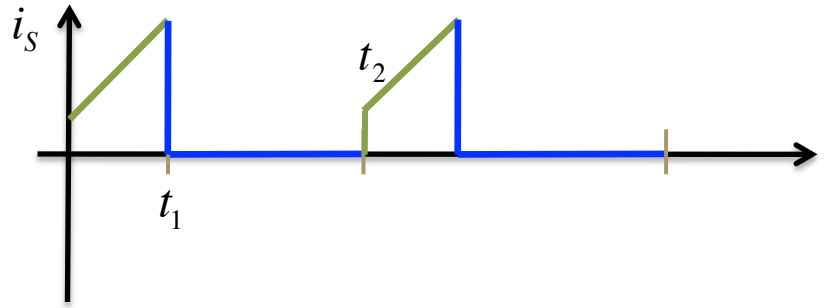

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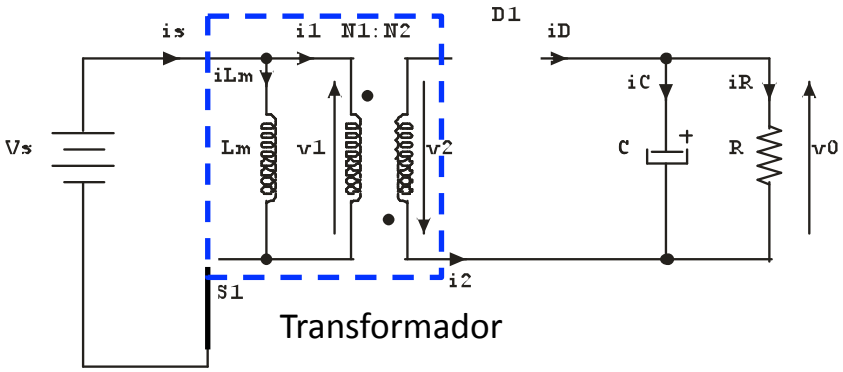

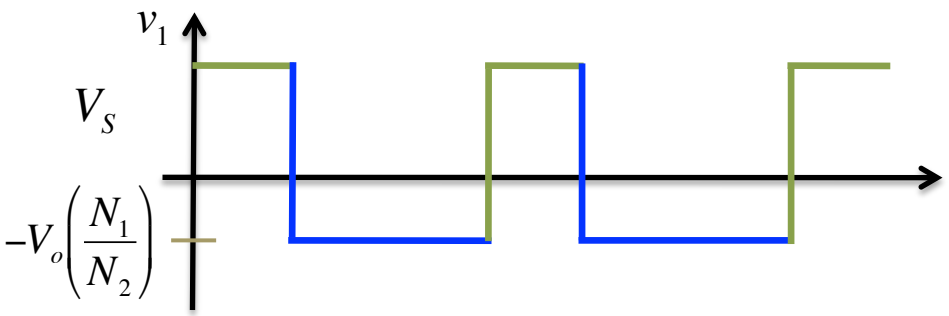

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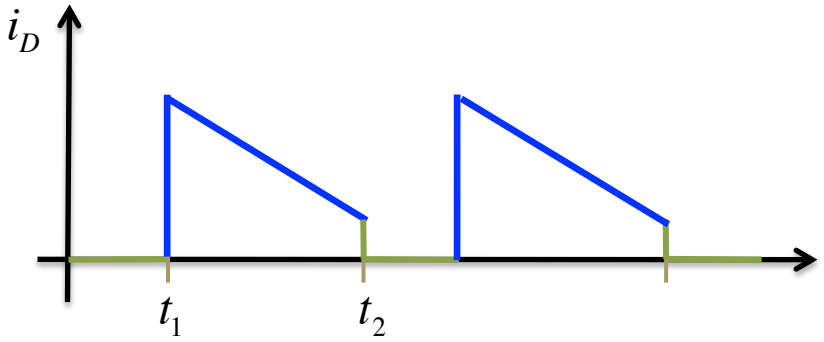

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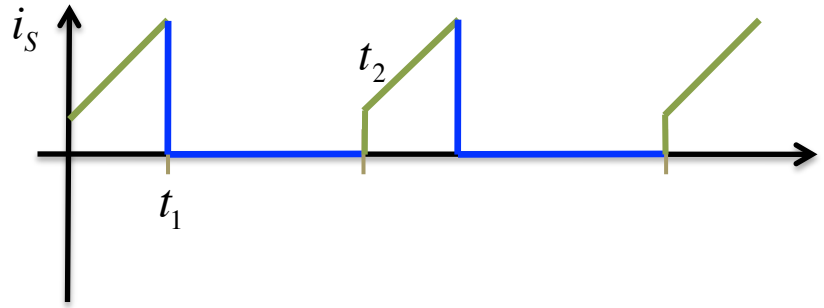

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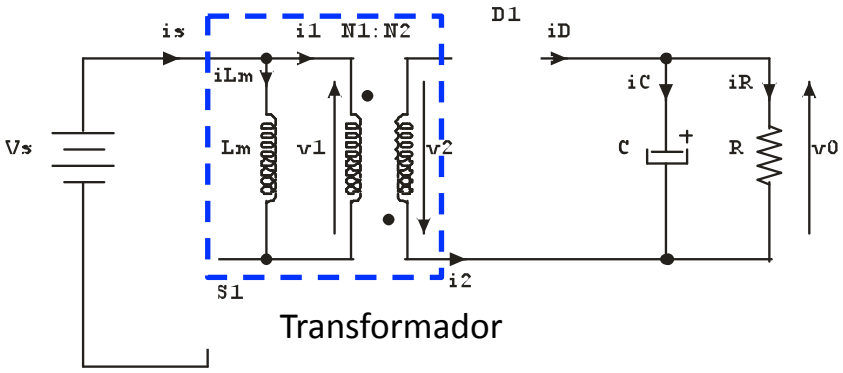
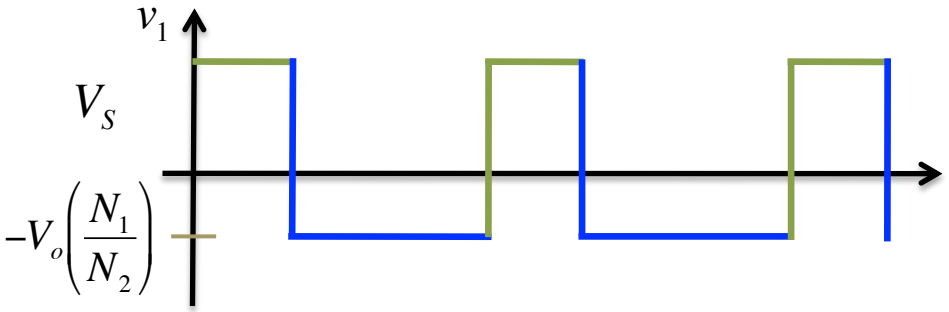


Transformador



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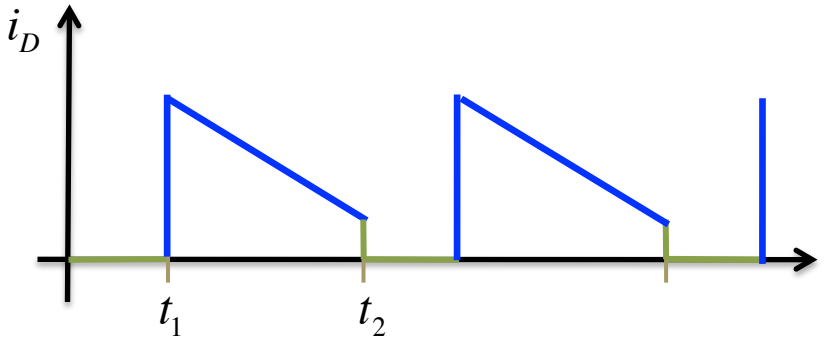

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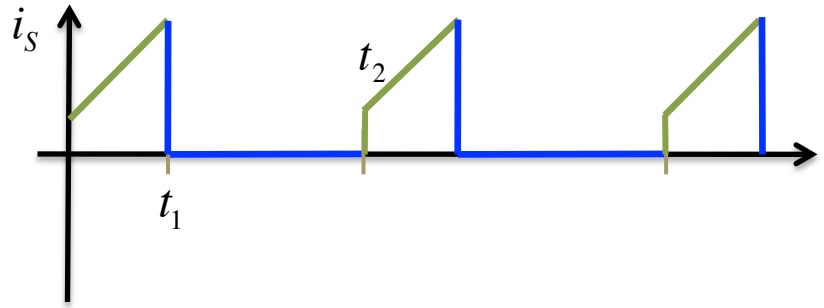
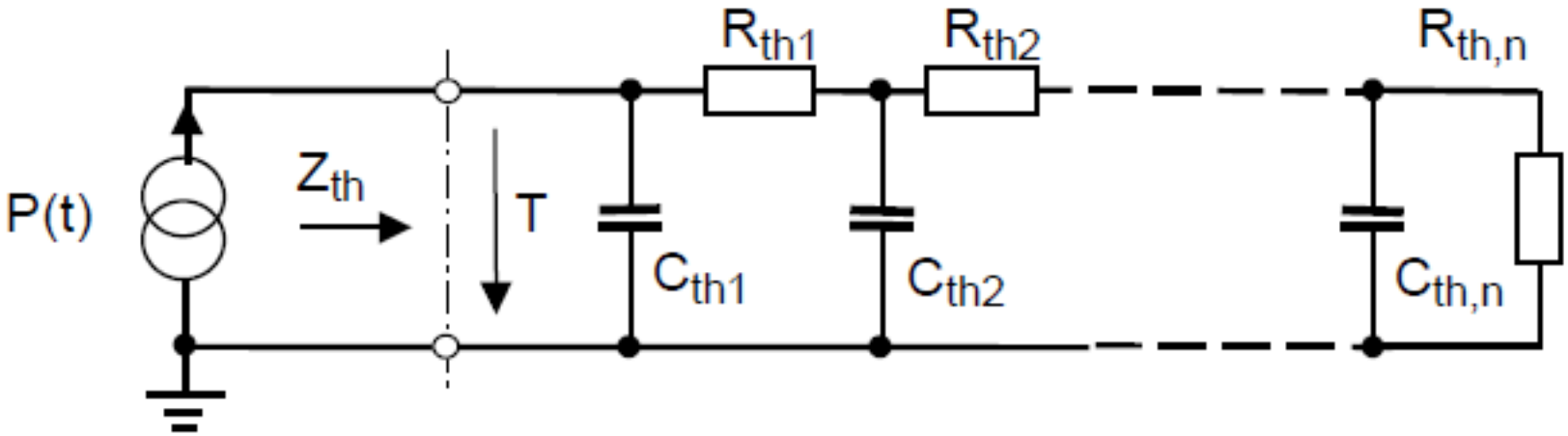
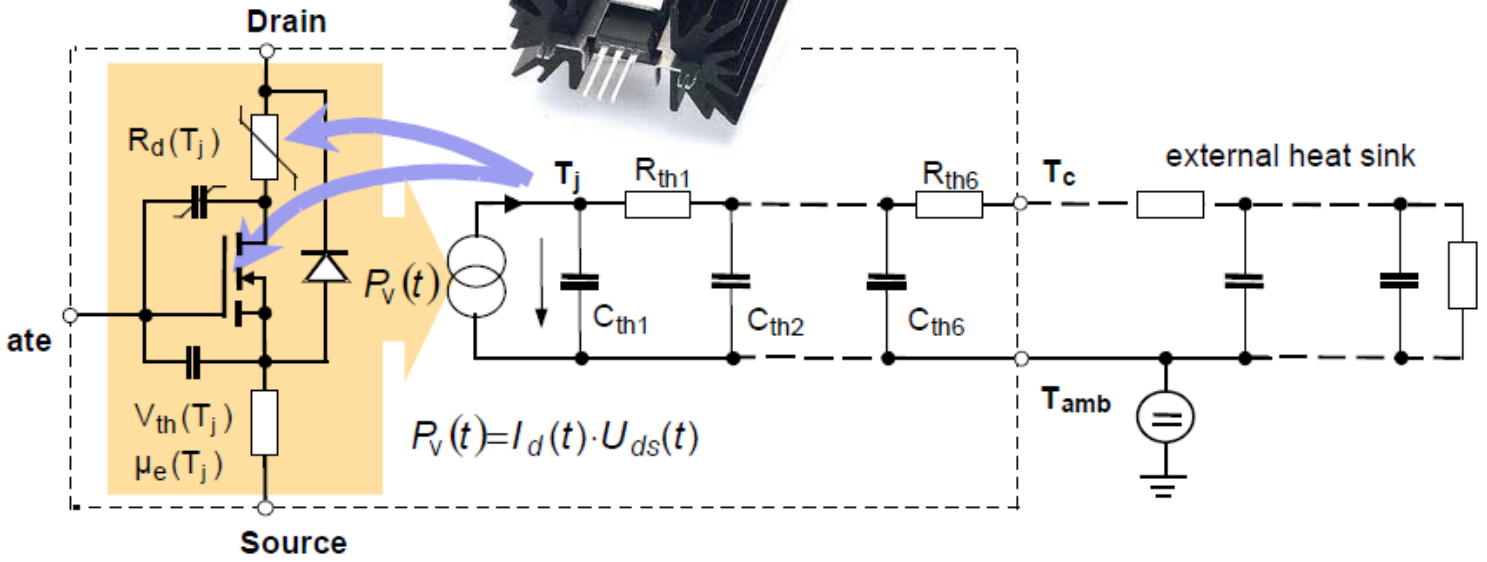


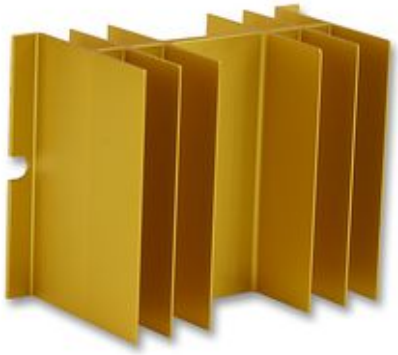
Disipación térmica

Modelo térmico		Modelo eléctrico	
Temperatura	T [°C]	Tensión	U [V]
Flujo potencia	P [W]	Intensidad	I [A]
Resistencia térmica	Rth [°C/W]	Resistencia	R [ohmios]
Capacidad térmica	Cth [Ws/°C]	Capacidad	C [Faradios]

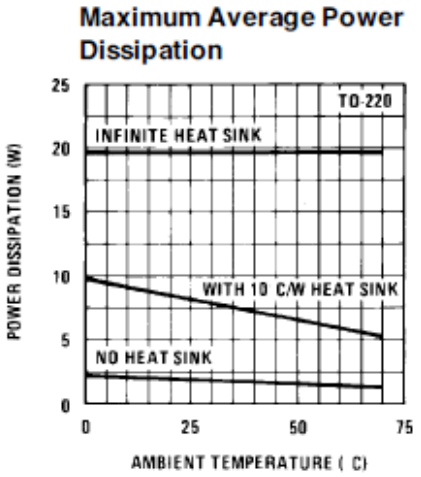


Disipación térmica





Rth = 2,2°C/W



Diseño modular

- Traco power.
- Vicor.

Models

Order Code			Output Power	Output 1	Output 2
PCB-mounting with solder pins	Chassis mounting with FASTON tabs	Chassis mounting with screw terminals			
TMS 06105				5 VDC/1200 mA	
TMS 06112				12 VDC/500 mA	
TMS 06115			6 Watt	15 VDC/400 mA	
TMS 06124				24 VDC/250 mA	
TMS 06212				+12 VDC/250 mA	−12 VDC/250 mA
TMS 06215				+15 VDC/200 mA	−15 VDC/200 mA
TMS 10105	TMS 10105F			5 VDC/2000 mA	
TMS 10112	TMS 10112F			12 VDC/900 mA	
TMS 10115	TMS 10115F		10 Watt	15 VDC/700 mA	
TMS 10124	TMS 10124F			24 VDC/450 mA	
TMS 10212	TMS 10212F			+12 VDC/450 mA	−12 VDC/450 mA
TMS 10215	TMS 10215F			+15 VDC/350 mA	−15 VDC/350 mA

Diseño modular

Murata Power Solutions

NMH Series

Isolated 2W Dual Output DC/DC Converters

FEATURES

- RoHS compliant
- Efficiency up to 86%
- Power density up to 1.44W/cm³
- Wide temperature performance at full 2 watt load, –40°C to 85°C
- Dual output from a single input rail
- UL 94V-0 package material
- No heatsink required
- Footprint from 1.46cm²
- Industry standard pinout
- Power sharing on output
- 1kVDC isolation
- 5V, 12V, 24V & 48V input
- 5V, 9V, 12V and 15V output
- Internal SMD construction
- Fully encapsulated with toroidal magnetics
- No external components required
- MTTF up to 1.5 million hours
- No electrolytic or tantalum capacitors

SELECTION GUIDE

Order Code	Nominal Input Voltage	Output Voltage	Output Current	Input Current at Rated Load	Efficiency	Isolation Capacitance	MTTF[1]	Package Style
	V	V	mA	mA	%	pF	kHrs	
NMH0505DC	5	±5	±200	500	80	24	1574	DIP
NMH0509DC	5	±9	±111	494	81	28	663	
NMH0512DC	5	±12	±83	488	82	30	338	
NMH0515DC	5	±15	±67	476	84	33	187	
NMH0505SC	5	±5	±200	500	80	24	1574	SIP
NMH0509SC	5	±9	±111	494	81	28	663	
NMH0512SC	5	±12	±83	488	82	30	338	
NMH0515SC	5	±15	±67	476	84	33	187	
NMH1205DC	12	±5	±200	208	80	35	490	DIP
NMH1209DC	12	±9	±111	201	83	55	343	
NMH1212DC	12	±12	±83	198	84	63	229	
NMH1215DC	12	±15	±67	198	84	66	148	
NMH1205SC	12	±5	±200	208	80	35	490	SIP
NMH1209SC	12	±9	±111	201	83	55	343	
NMH1212SC	12	±12	±83	198	84	63	229	
NMH1215SC	12	±15	±67	198	84	66	148	
NMH2405DC	24	±5	±200	103	81	41	318	DIP
NMH2409DC	24	±9	±111	98	85	75	249	
NMH2412DC	24	±12	±83	97	86	95	183	
NMH2415DC	24	±15	±67	97	86	104	127	
NMH2405SC	24	±5	±200	103	81	41	318	SIP
NMH2409SC	24	±9	±111	98	85	75	249	
NMH2412SC	24	±12	±83	97	86	95	183	
NMH2415SC	24	±15	±67	97	86	104	127	
Obsolete								**Recommended Alternative**
NMH4805DC	48	±5	±200	51	82	45	235	DIP
NMH4809DC	48	±9	±111	51	82	74	195	
NMH4812DC	48	±12	±83	49	85	90	152	
NMH4815DC	48	±15	±67	49	85	112	112	
NMH4805SC	48	±5	±200	51	82	45	235	SIP
NMH4809SC	48	±9	±111	51	82	74	195	
NMH4812SC	48	±12	±83	49	85	90	152	

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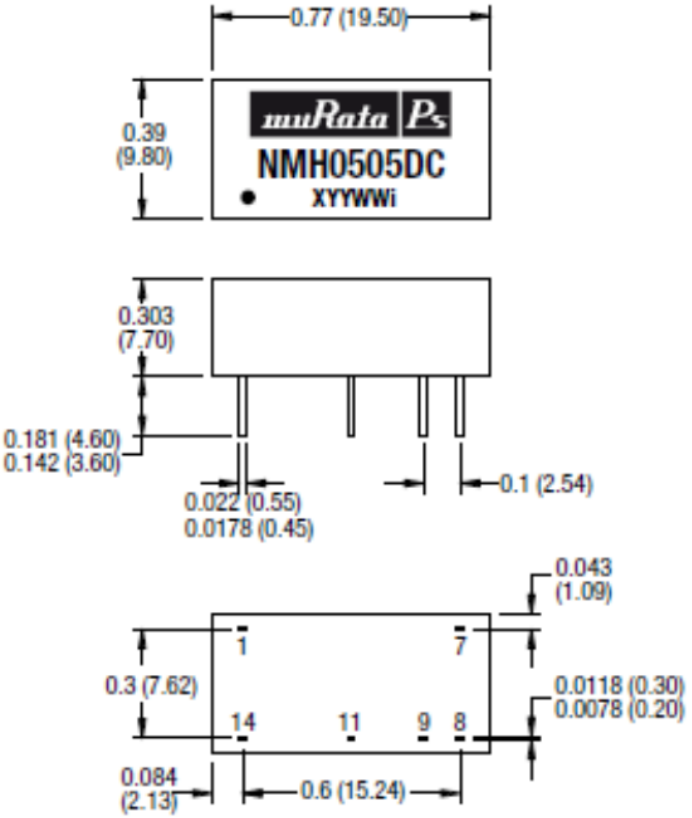
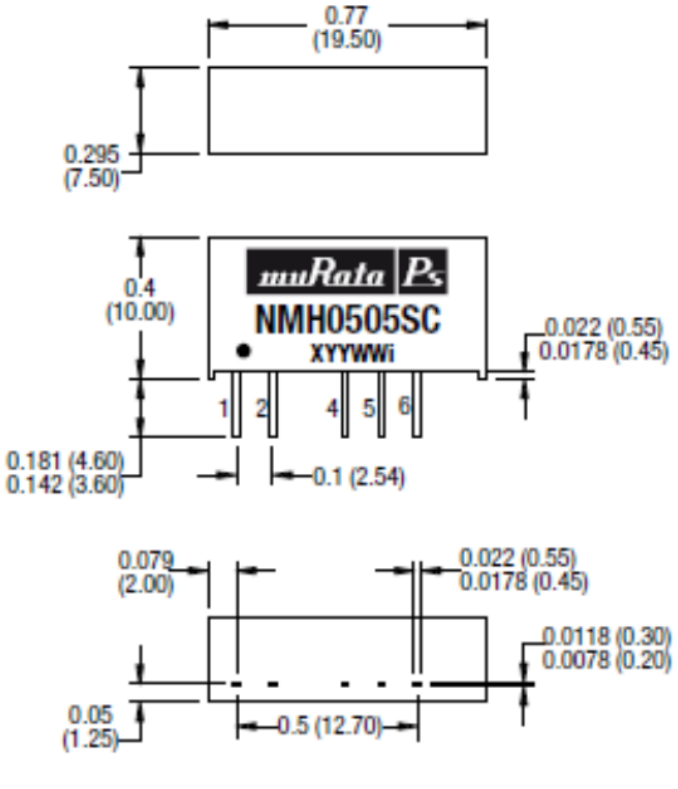
Diseño modular

DIP package



SIP package



All dimensions in inches ±0.01 (mm ±0.25mm). All pins on a 0.1 (2.54) pitch and within ±0.01 (0.25) of true position.

Weight: 2.85g (DIP) 2.76g (SIP)