



RAS

Robotics and Automation
Society

CAPACITAÇÃO Eletrônica básica

 @rascimatec

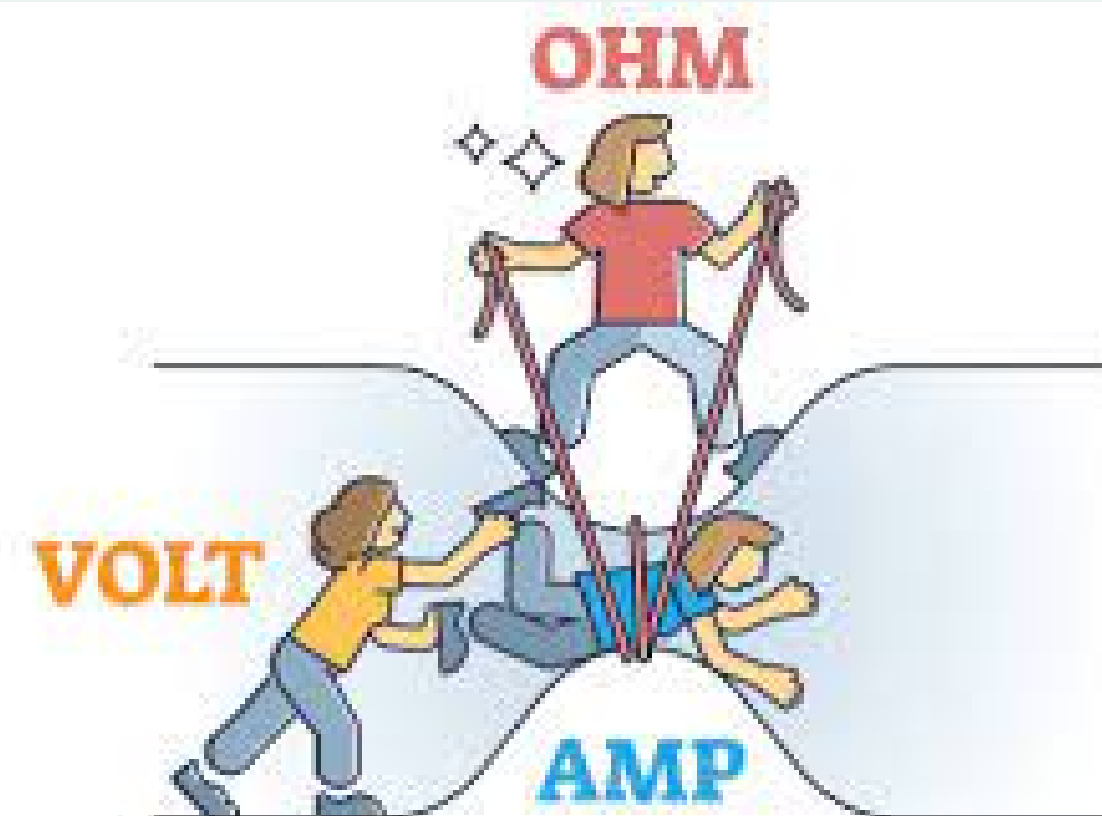
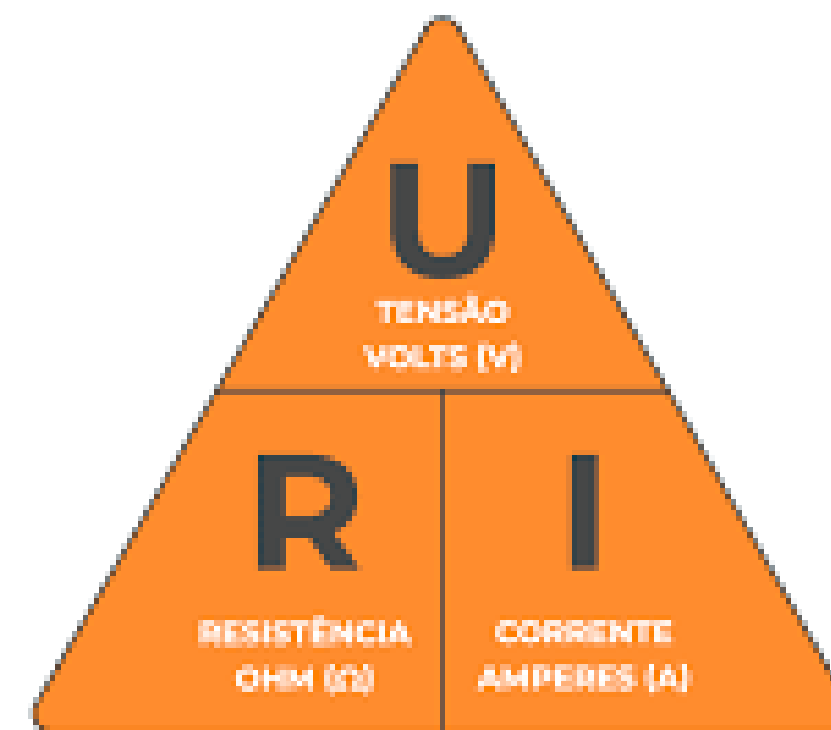
Sumário

Conceitos básicos:

- 1º Lei de OHM
- Resistores
- Capacitores
- Indutores
- Semicondutores
- Circuitos integrados

1º Lei de OHM

O que significa a primeira lei de OHM?

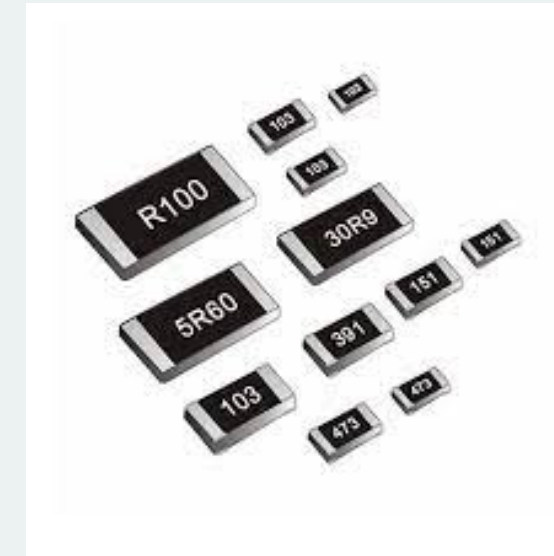


Resistores

Como os resistores funcionam?

Resistores em série e em paralelo

Código de cores



Como funciona o resistor?

Segunda lei de OHM

$$R = \frac{\rho L}{A}$$

R – resistência elétrica (Ω)

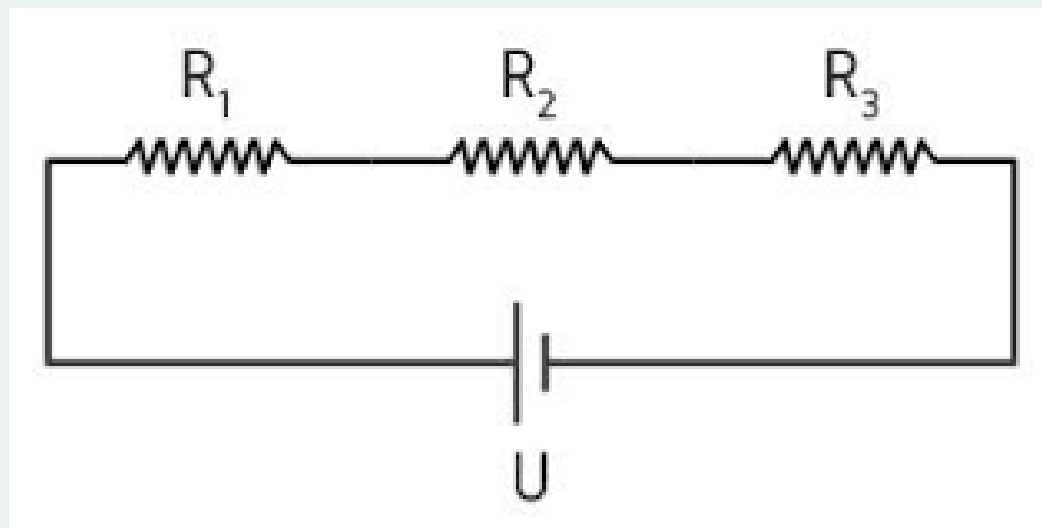
ρ – resistividade ($\Omega.m$)

L – comprimento (m)

A – área transversal (m^2)

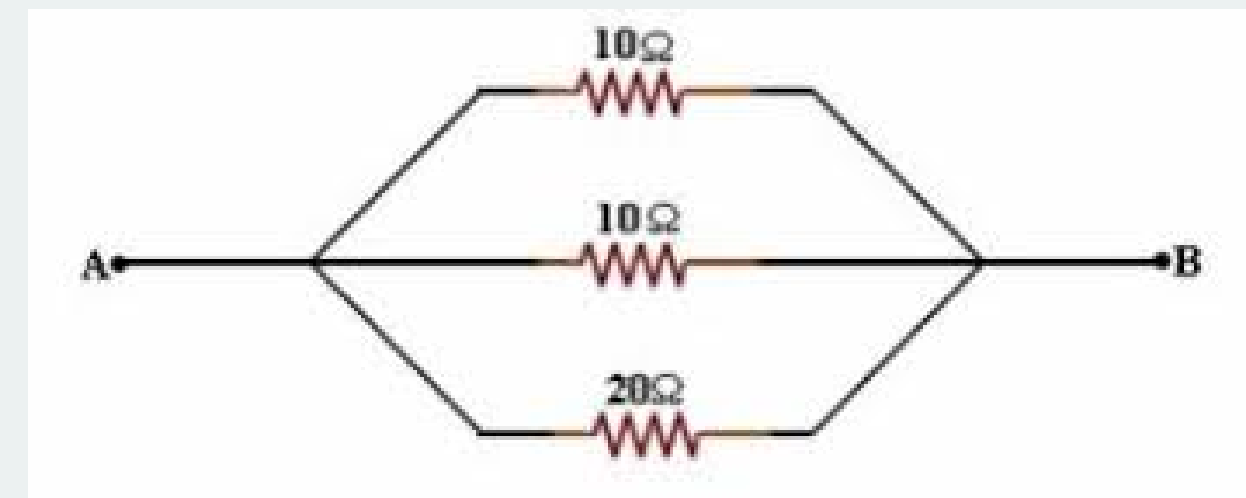
Associação de resistores

Associação Serie



$$R_{EQ} = R_1 + R_2 + R_3 + \dots + R_N$$

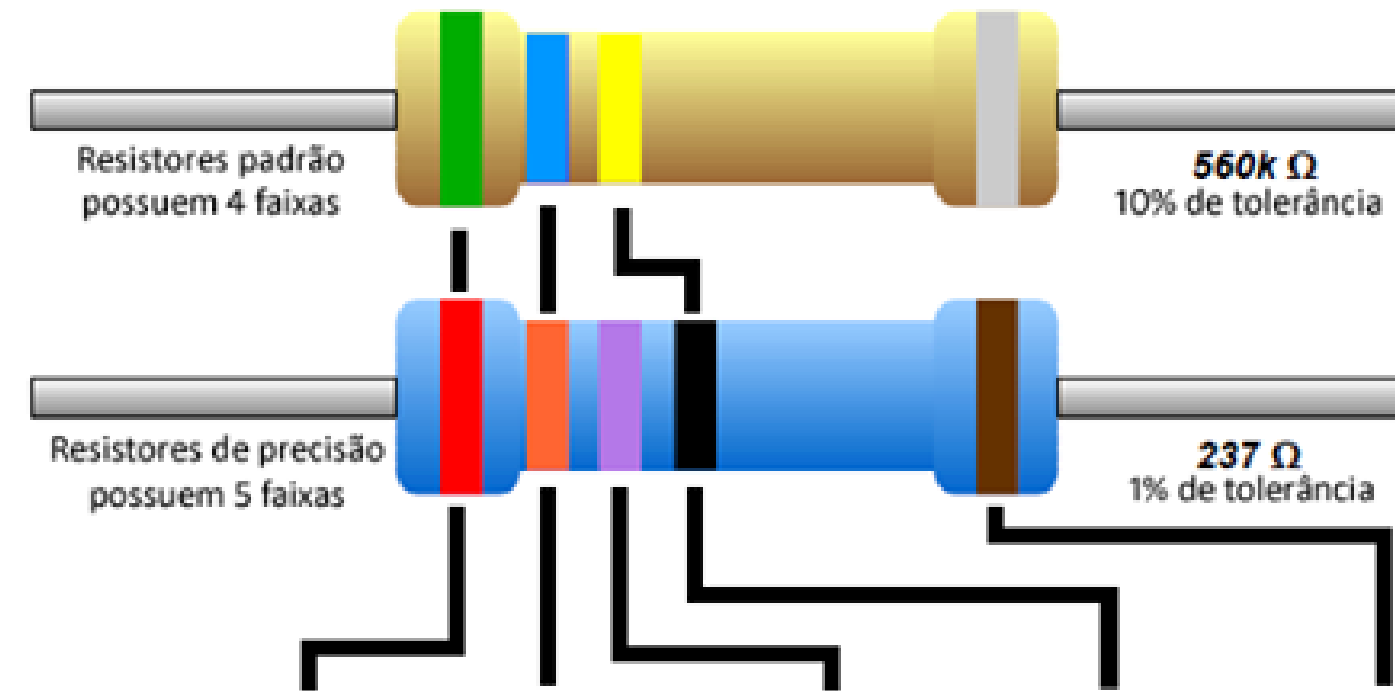
Associação Paralelo



$$\frac{1}{R_{EQ}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \dots + \frac{1}{R_N}$$

Código de Cores

A extremidade com mais faixas deve apontar para a esquerda

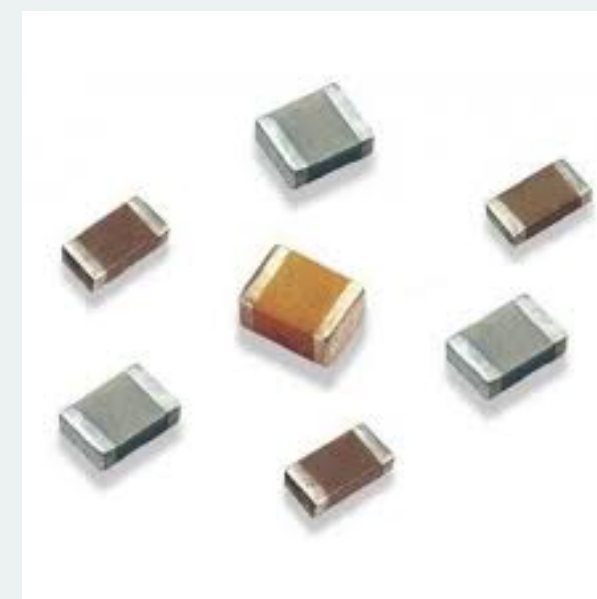


Cor	1ª Faixa	2ª Faixa	3ª Faixa	Multiplicador	Tolerância
Preto	0	0	0	$\times 1 \Omega$	
Marrom	1	1	1	$\times 10 \Omega$	+/- 1%
Vermelho	2	2	2	$\times 100 \Omega$	+/- 2%
Laranja	3	3	3	$\times 1K \Omega$	
Amarelo	4	4	4	$\times 10K \Omega$	
Verde	5	5	5	$\times 100K \Omega$	+/- .5%
Azul	6	6	6	$\times 1M \Omega$	+/- .25%
Violeta	7	7	7	$\times 10M \Omega$	+/- .1%
Cinza	8	8	8		+/- .05%
Branco	9	9	9		
Dourado				$\times .1 \Omega$	+/- 5%
Prateado				$\times .01 \Omega$	+/- 10%

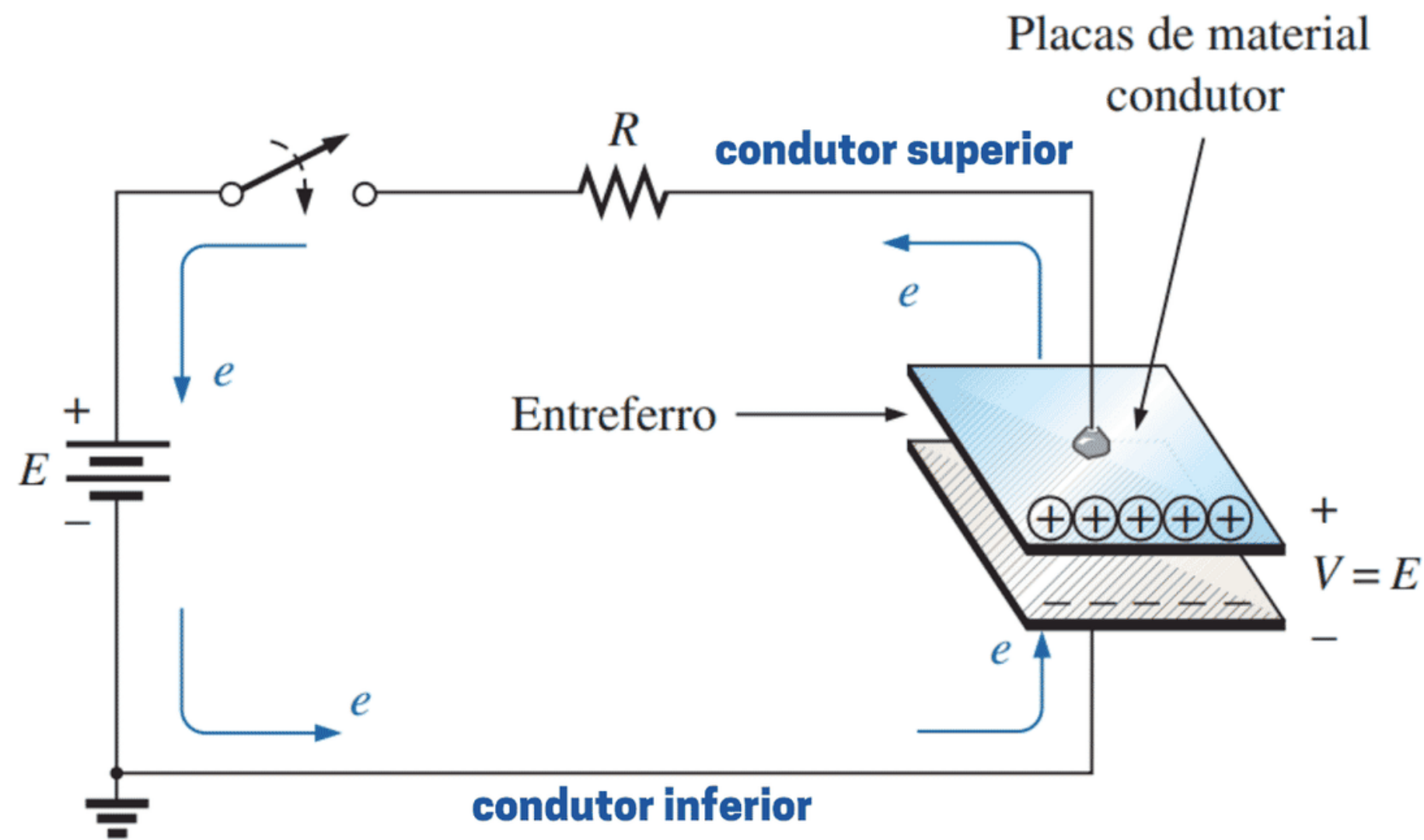
Capacitores

Como os capacitores funcionam?

Capacitores em série e em paralelo

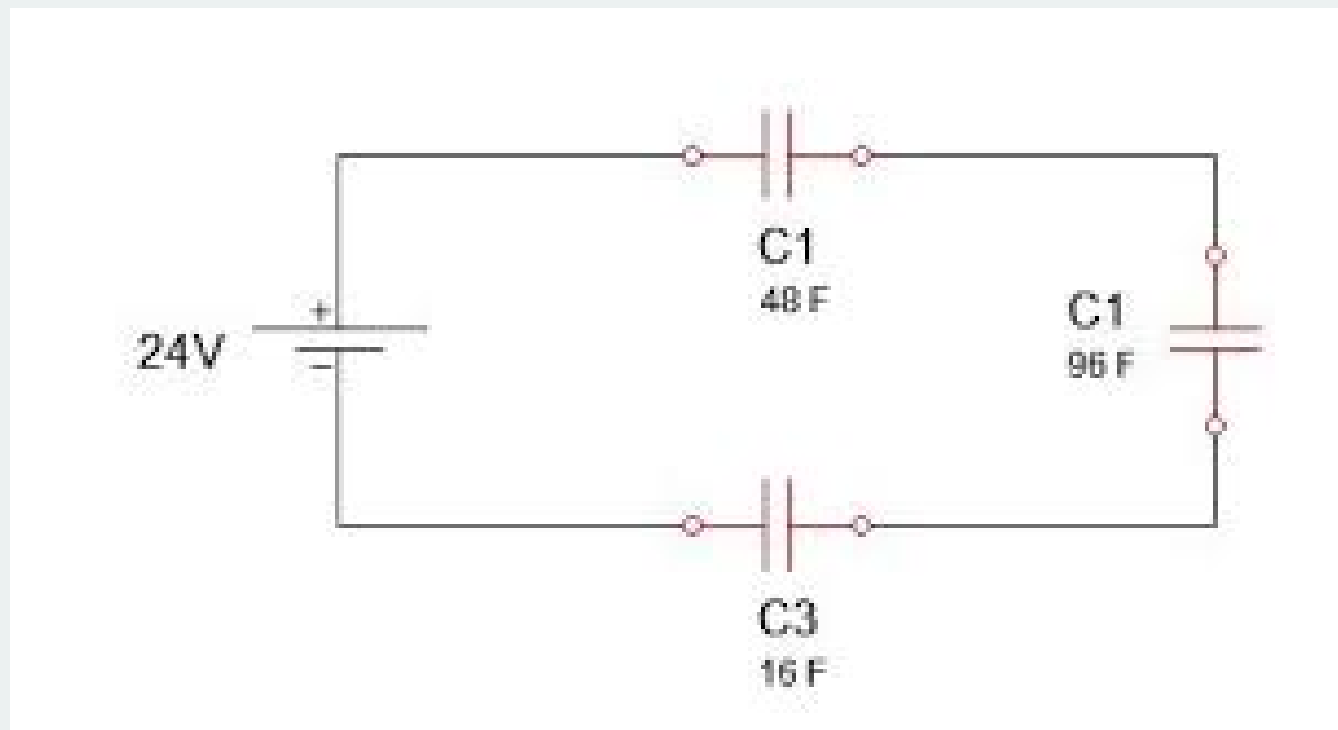


Como funciona o capacitor?



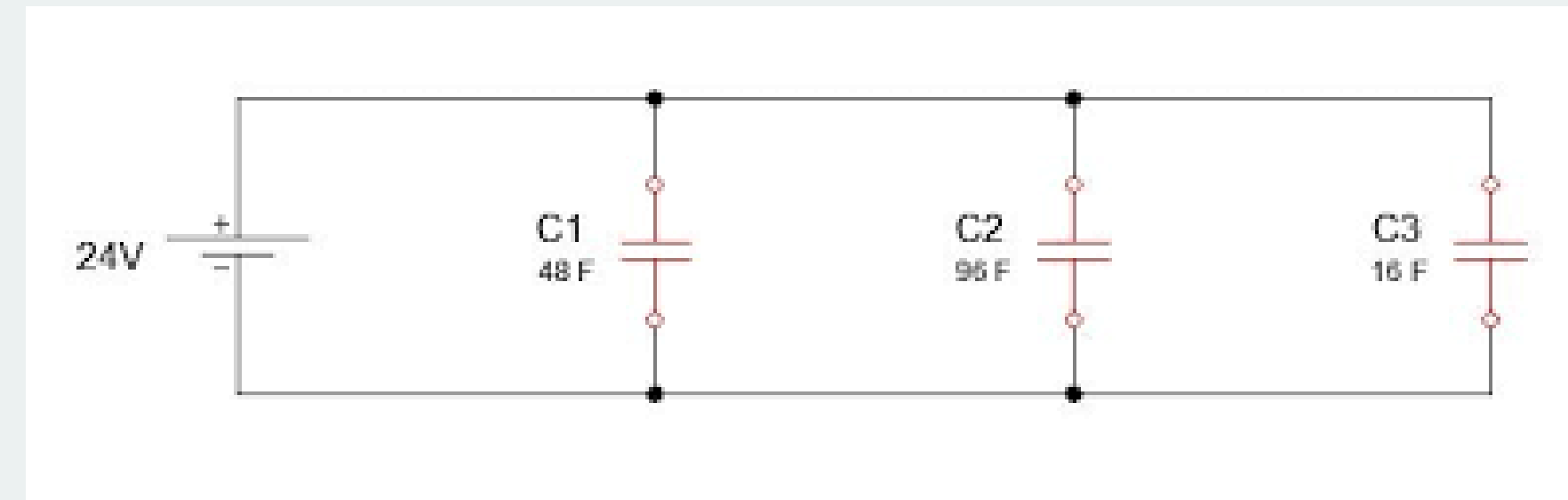
Associação de capacitores

Associação Serie



$$\frac{1}{C_{eq}} = \frac{1}{C1} + \frac{1}{C2} + \frac{1}{C3} + \dots \frac{1}{Cn}$$

Associação Paralelo



$$C_{eq} = C1 + C2 + \dots Cn$$

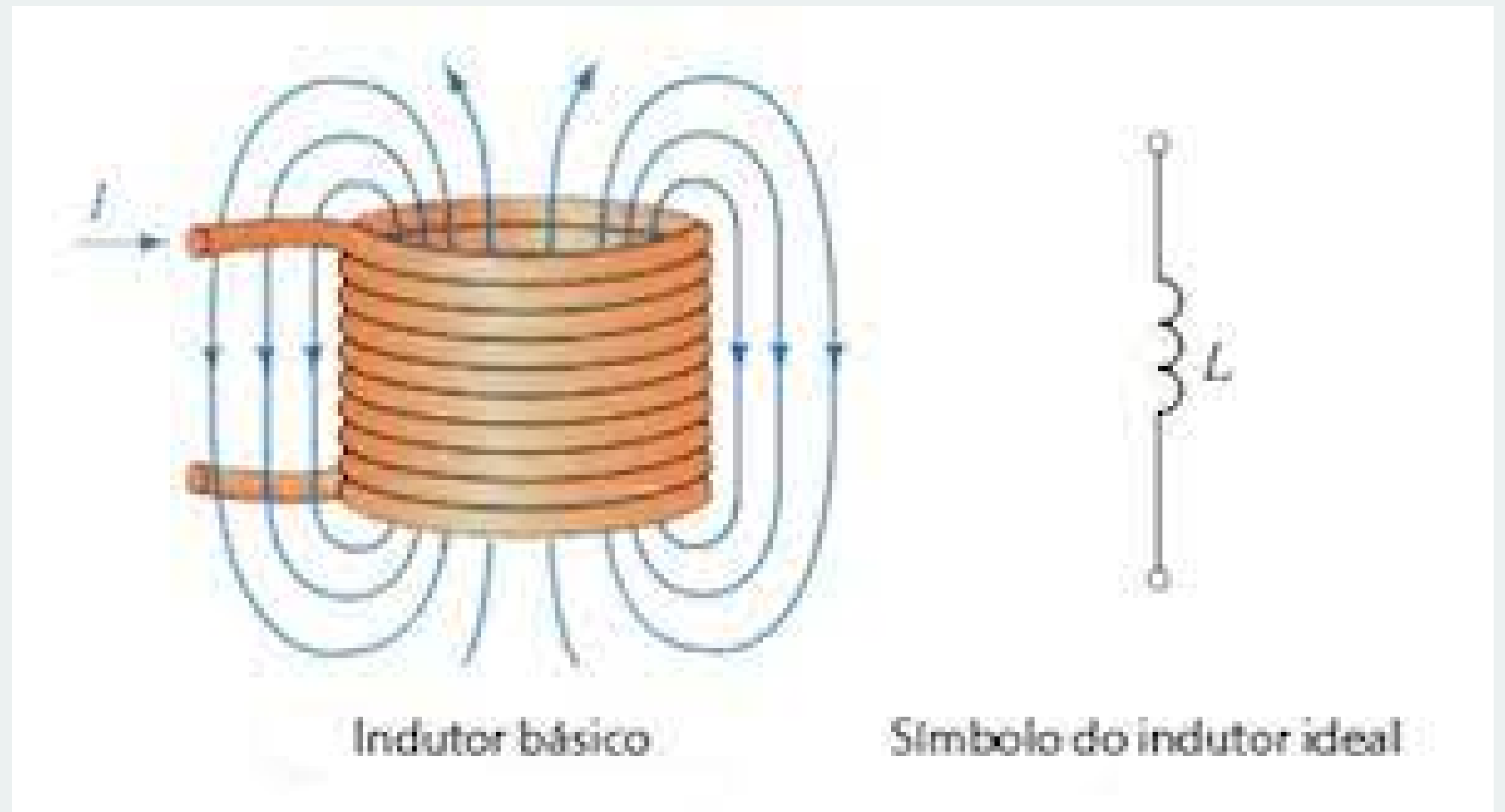
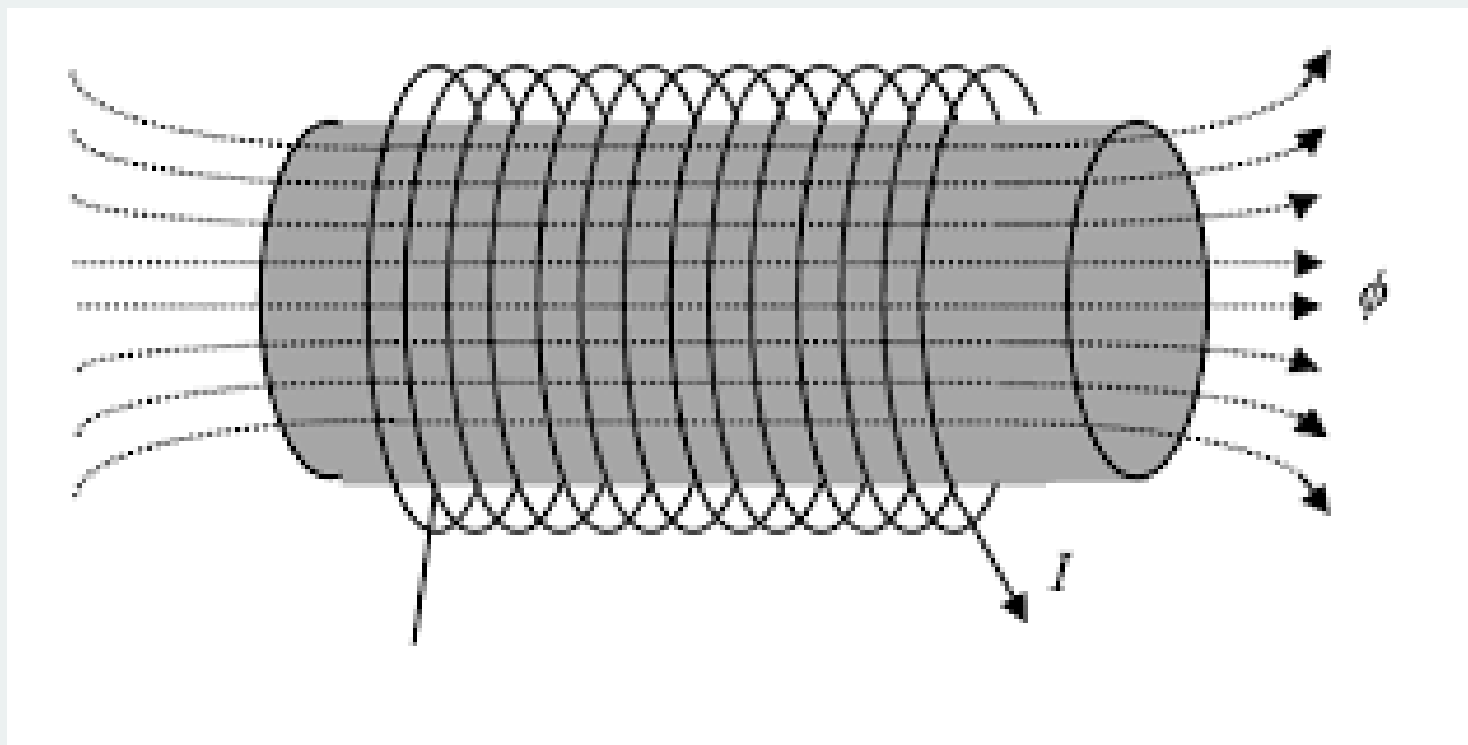
Indutores

Como os indutores funcionam?

Indutores em série e em paralelo

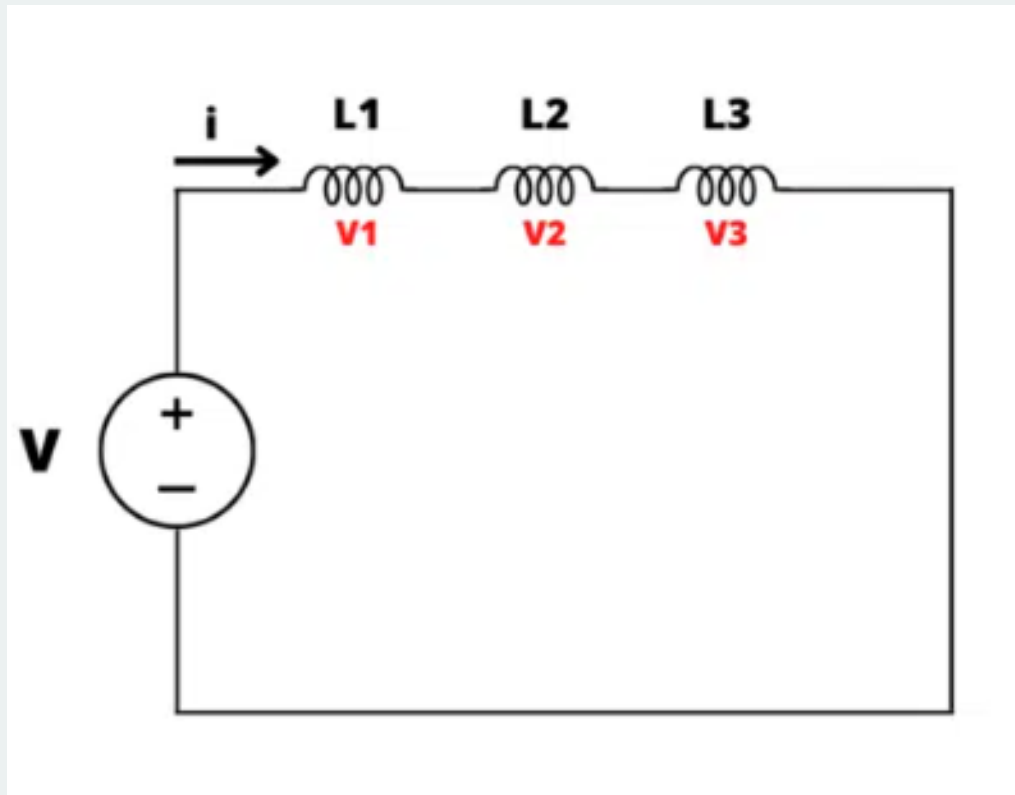


Como funciona o indutor?



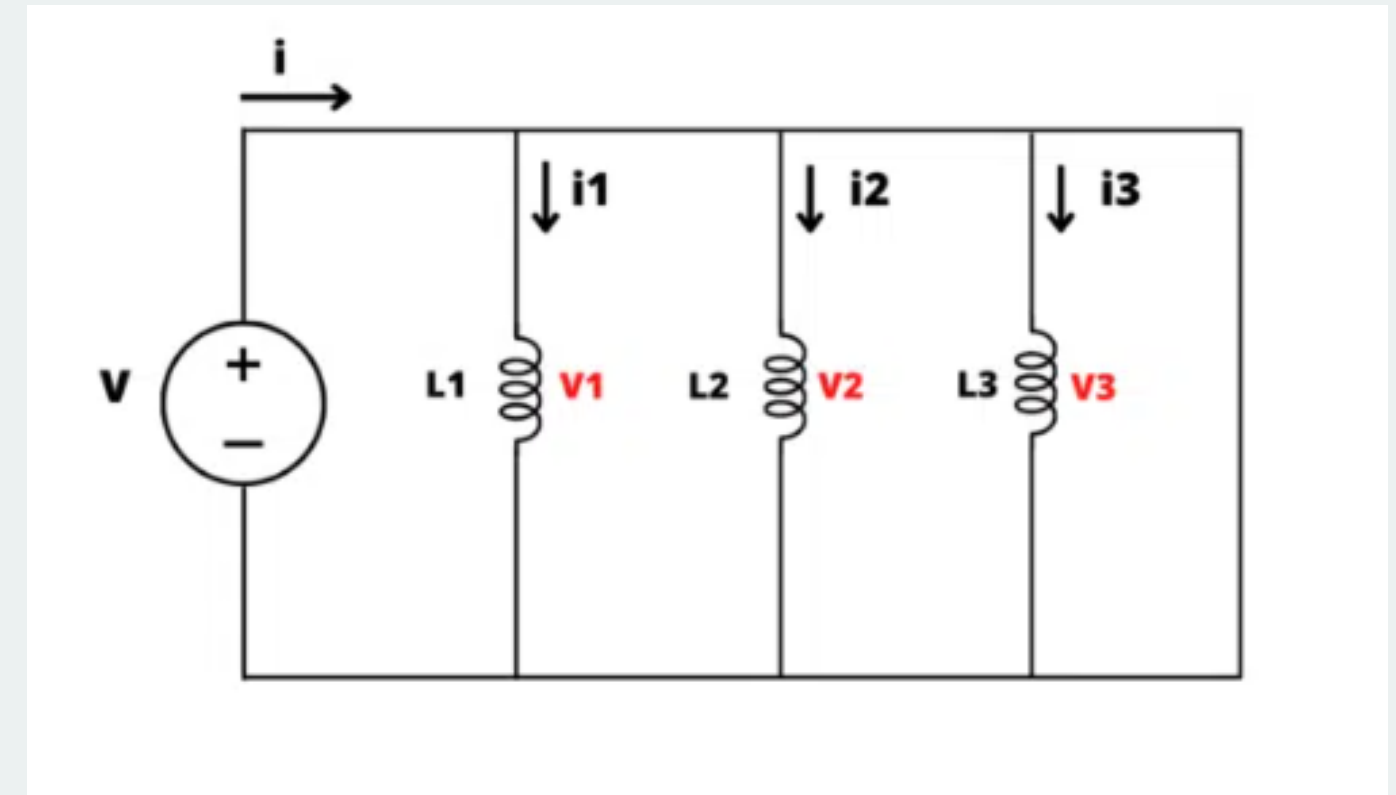
Associação de indutores

Associação Serie



$$L_{eq} = (L_1 + L_2 + L_3 + \dots + L_n)$$

Associação Paralelo



$$L_{eq} = \frac{1}{L_1} + \frac{1}{L_2} + \frac{1}{L_3} + \dots + \frac{1}{L_n}$$

Semicondutores

O que são semicondutores?

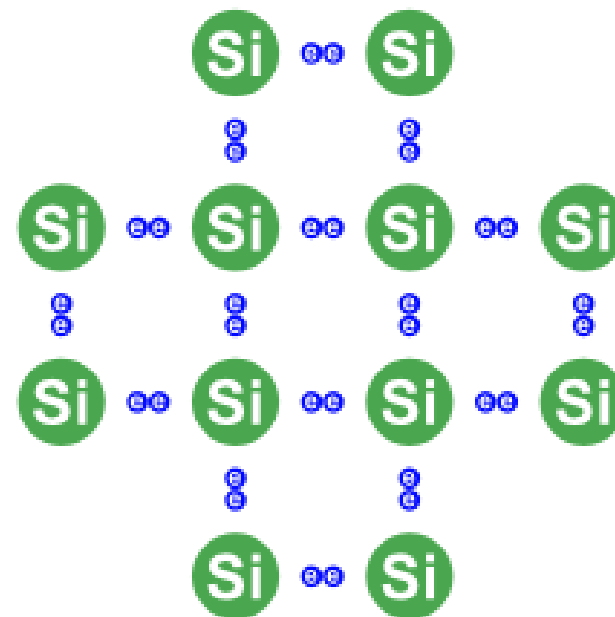
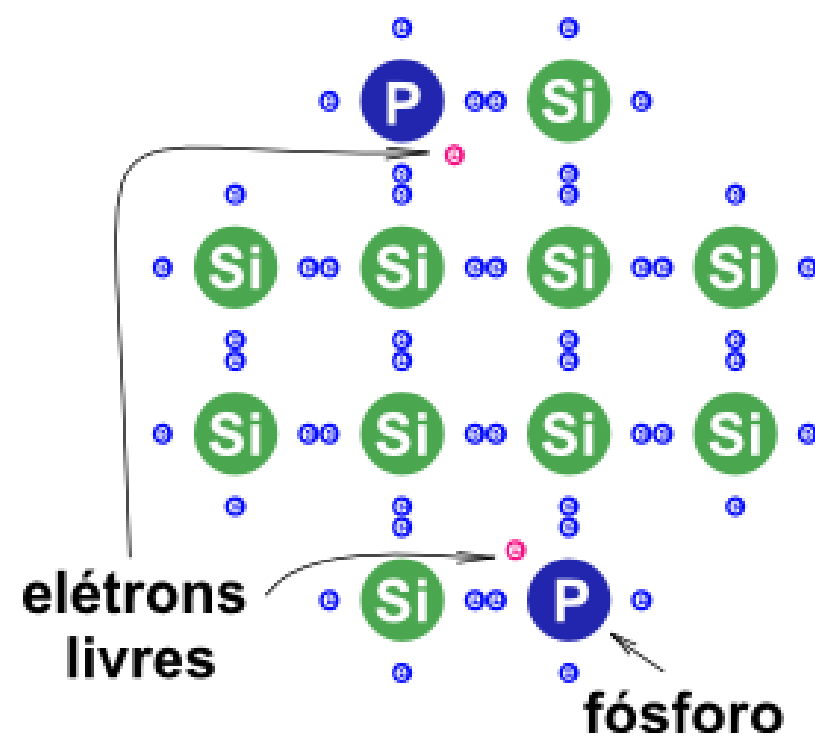
- Dopagem;

Dispositivos:

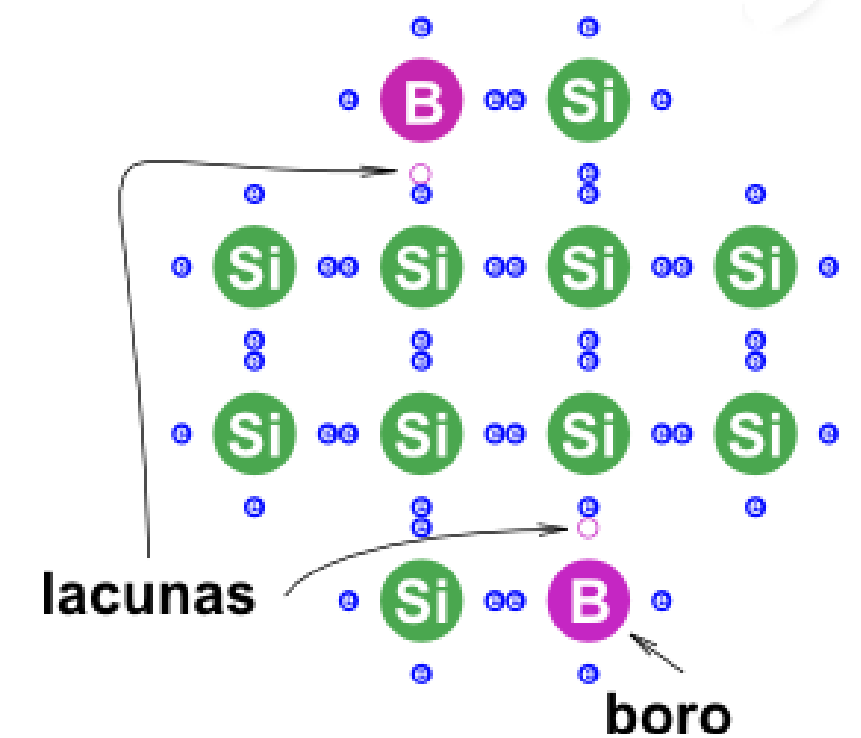
- Diodo;
- Transistor;

Dopagem de semicondutores

Dopagem N

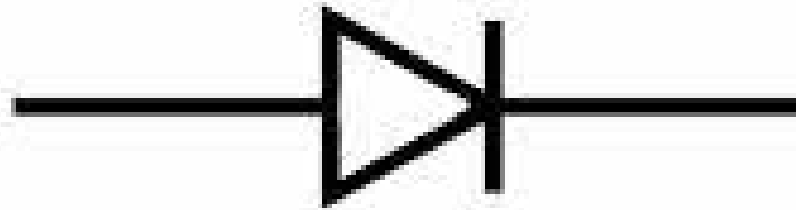


Dopagem P

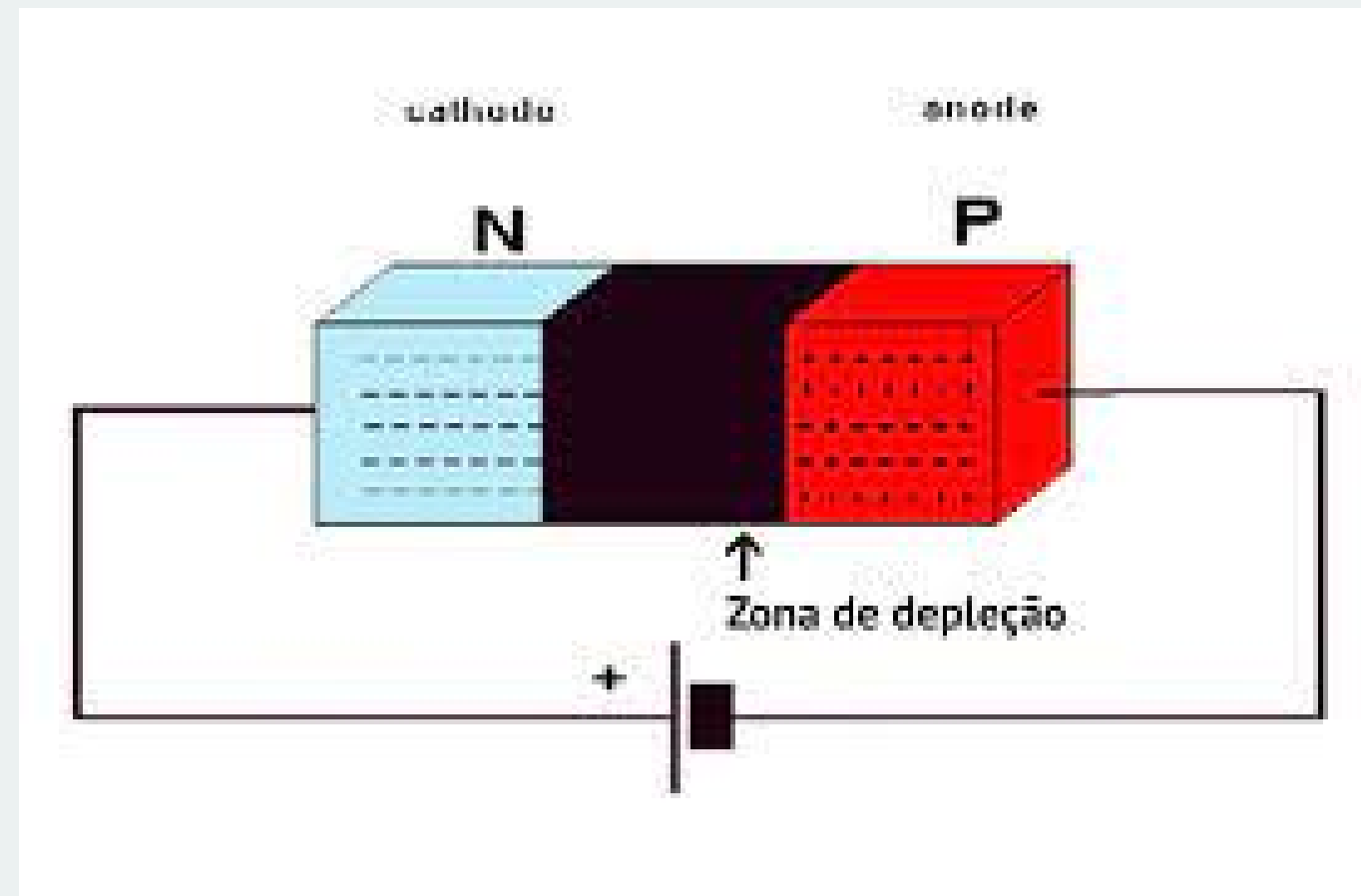


Diodos

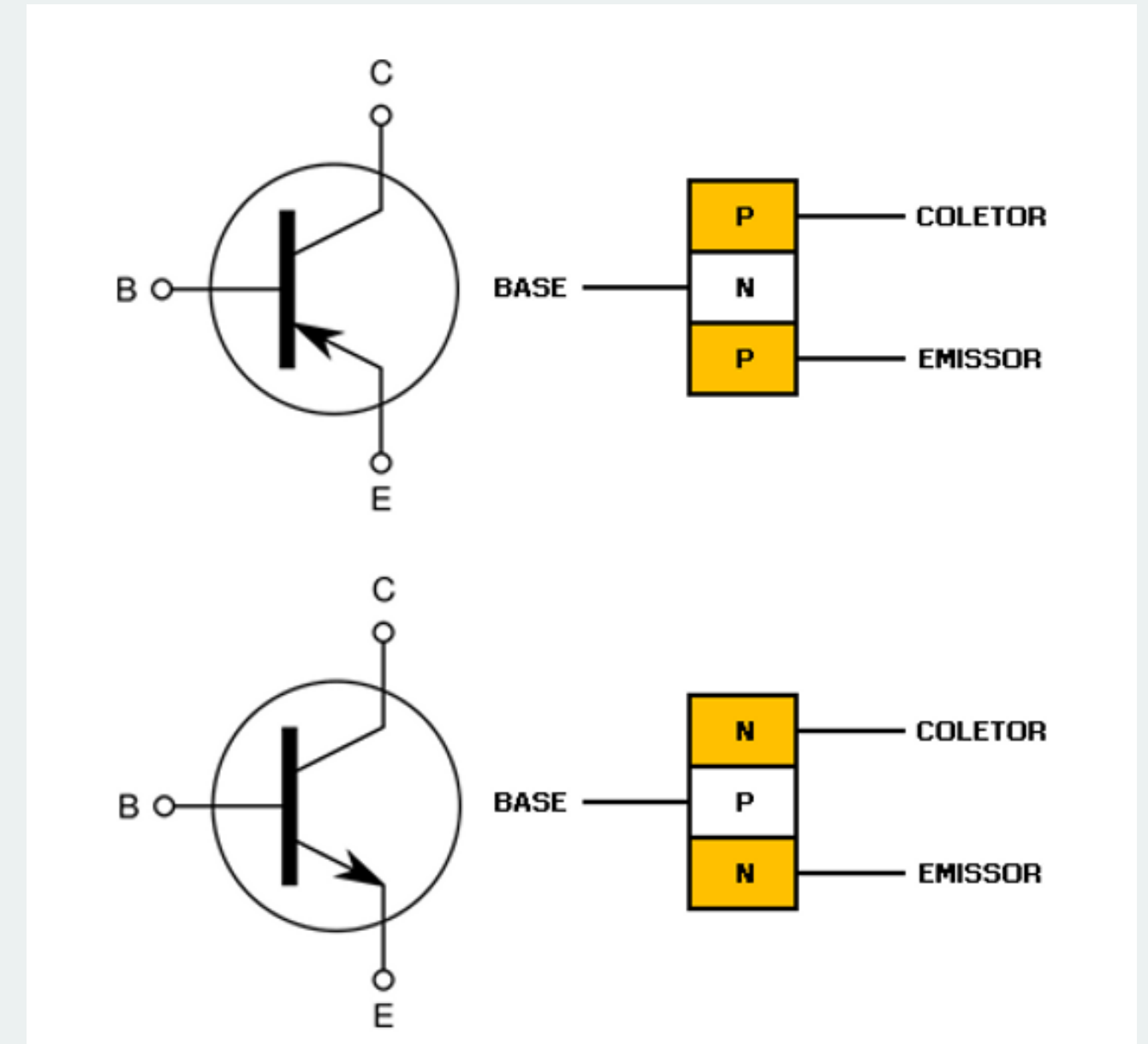
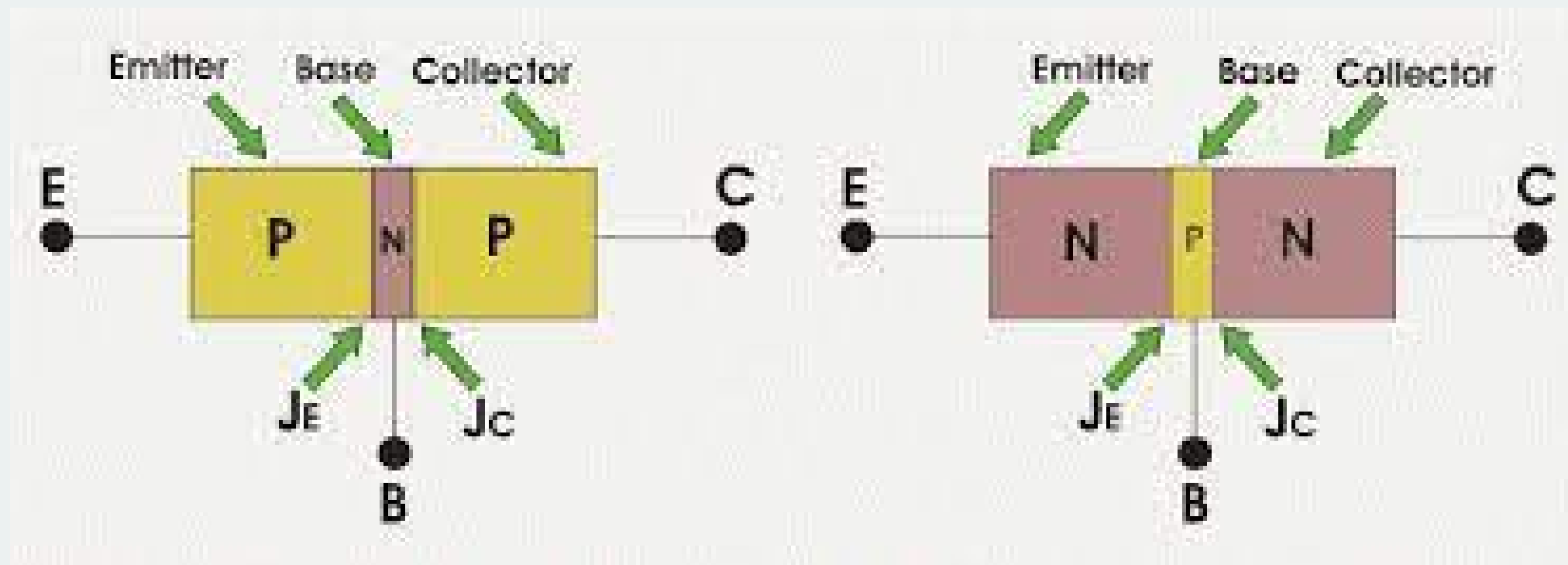
Anodo
(+)

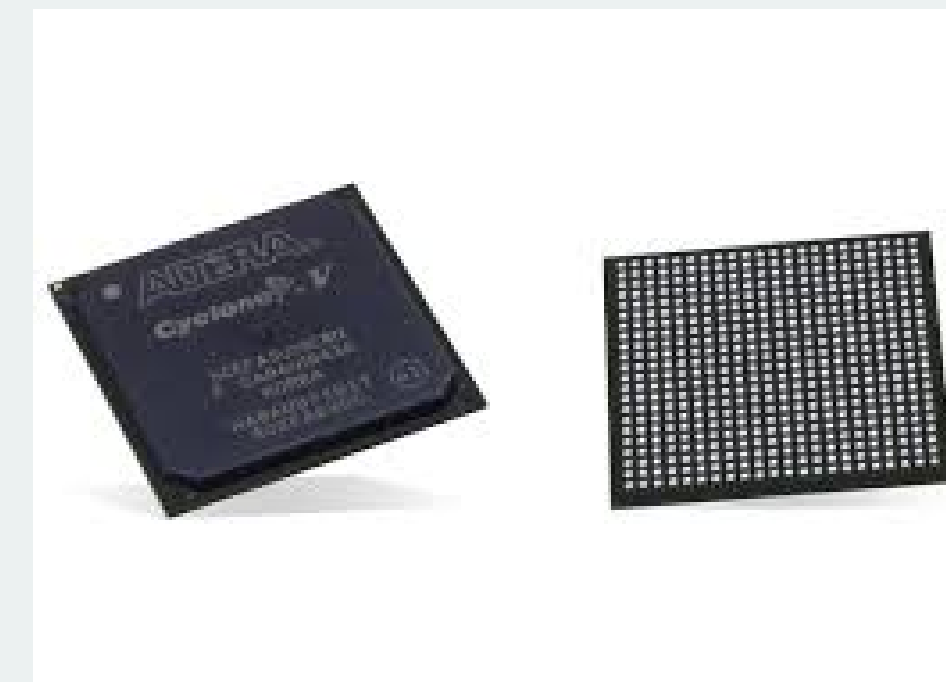


Catodo
(-)



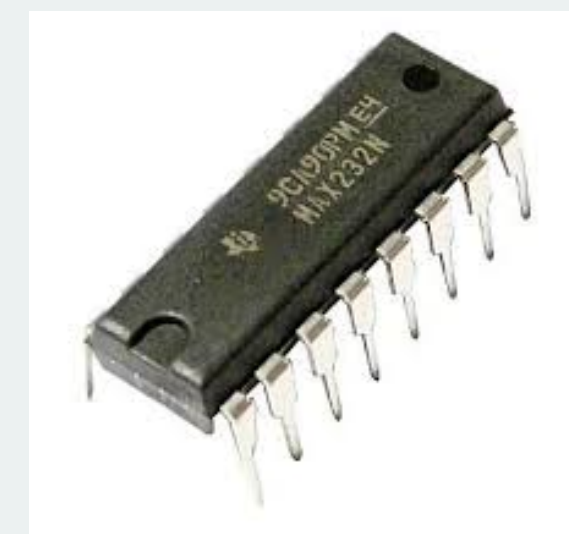
Transistores



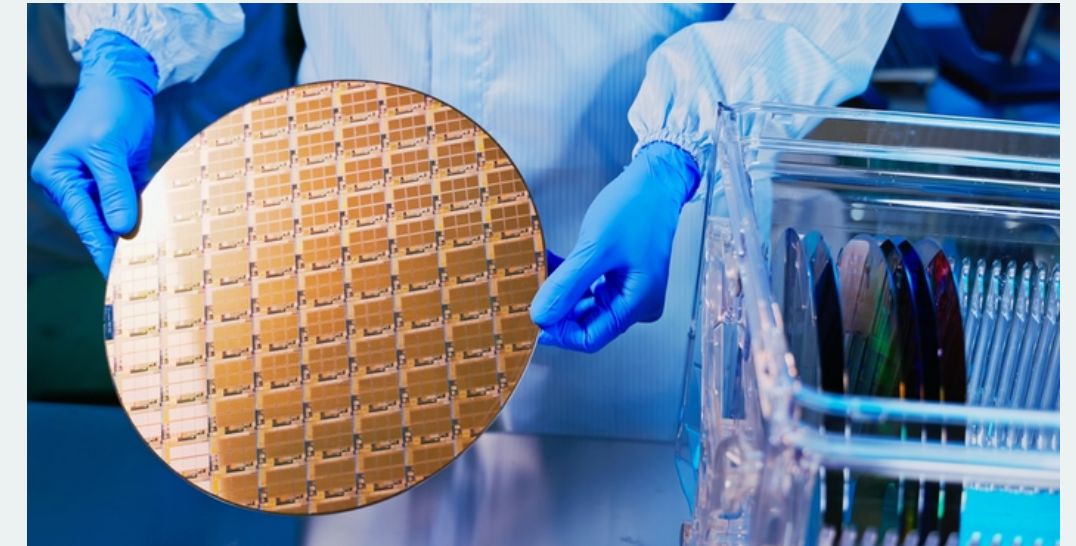
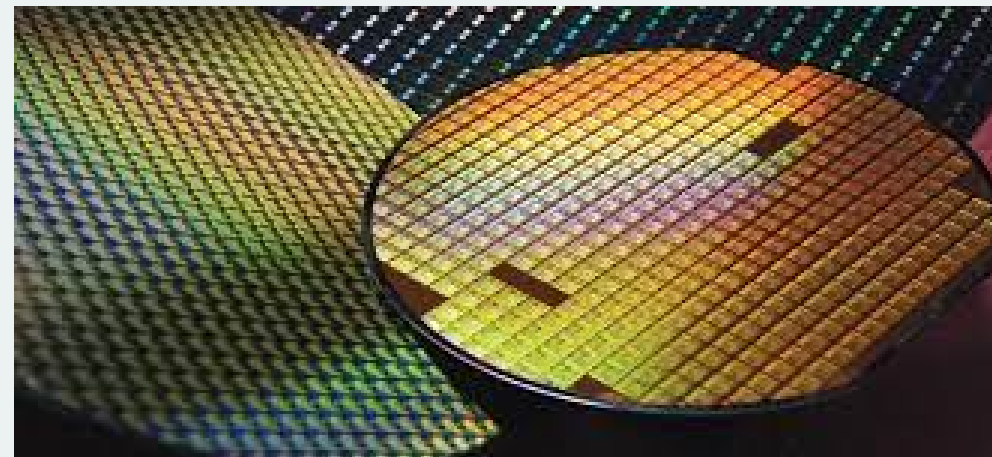
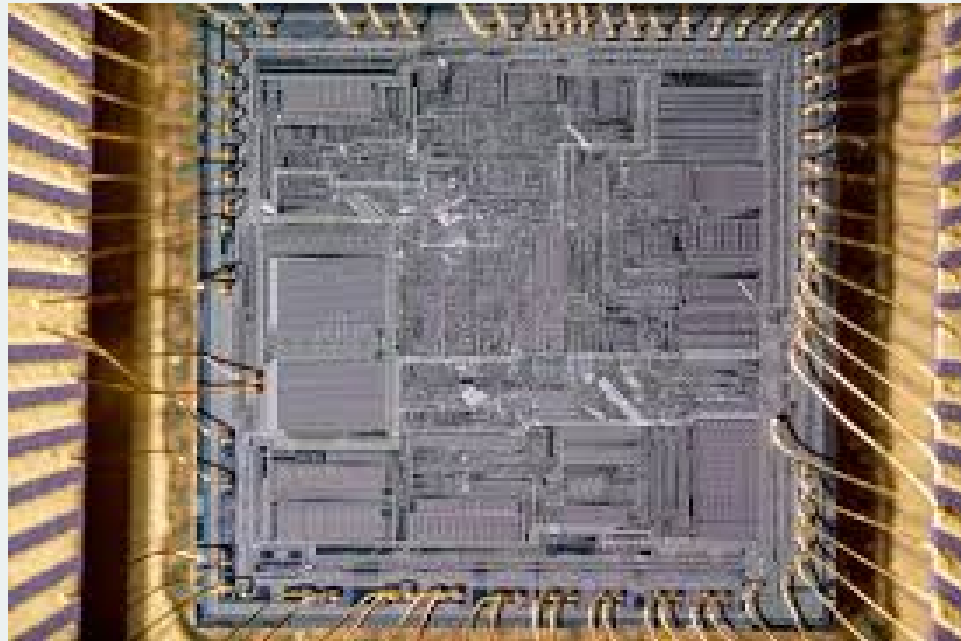


Circuitos integrados

Como os circuitos integrados funcionam?



Circuitos integrados



A pior placa de video do mundo ->

Computador de 8bits na protoboard ->

Processador no microscopio ->



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