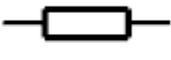
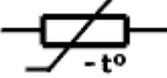
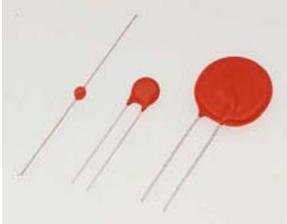
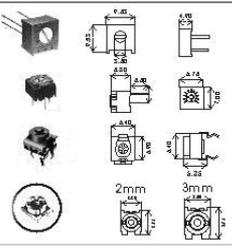


SIMBOLOGIA DE COMPONENTES

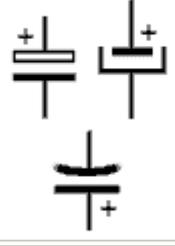
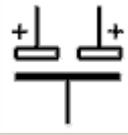
RESISTORES

| | | | |
|--|---|--|---|
| Fixo |  | Potenciômetro |  |
| |  | | |
| Ajustável (Trimpot) |  | Coefficiente Negativo de Temperatura (NTC) |  |
| Dependente da temperatura (VDR) (Varistor) |  | Coefficiente Positivo de Temperatura (PTC) |  |
| Com derivação |  | Com derivações fixas |  |
| Fotoresistor (LDR) |  | | |

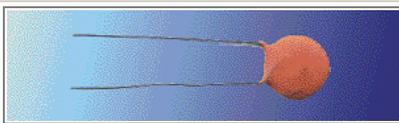
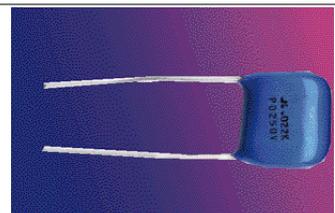
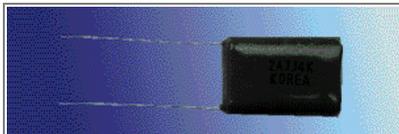
TIPOS DE RESISTORES

| | | | |
|-----------------|--|-----|---|
| Filme carbônico |  | | |
| Filme Metálico |  | | |
| Potenciômetro |  | | |
| Varistor (VDR) |  | NTC |  |
| TRIMPOTs |  | |  |

CAPACITORES

| | | | |
|---------------------------------------|---|---|---|
| Capacitor fixo sem polaridade |  | Capacitor Eletrolítico (polarizado) |  |
| Capacitor Variável |  | Capacitor Ajustável |  |
| Capacitor eletrolítico com derivações |  | Capacitor com resistência série inerente (supressor de ruído) |  |
| Capacitor de chassis |  | Filtro de passagem | |

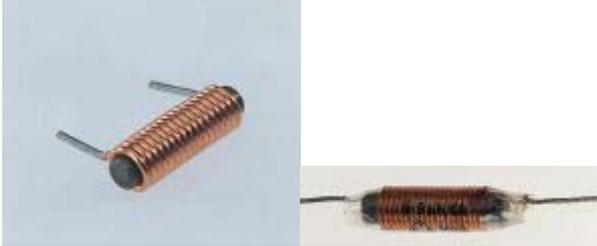
EXEMPLOS DE CAPACITORES

| | |
|--|--|
| Capacitor cerâmico |  |
| Capacitor eletrolítico de tântalo |  |
| Capacitor de polipropileno revestido com epóxi |  |
| Capacitor de poliéster |  |
| Capacitor eletrolítico de alumínio |  |
| Capacitor Ajustável |  |

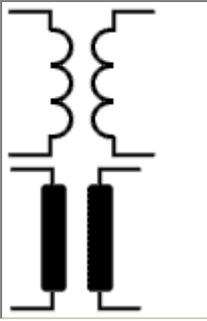
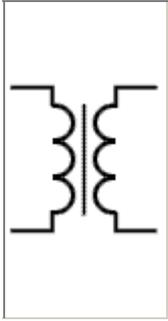
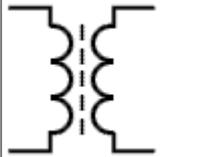
BOBINAS

| | | | |
|----------------------------|---|--|---|
| Bobina com núcleo de ar |  | Bobina com núcleo de ar com derivações |  |
| Bobina com núcleo de ferro |  | Bobina com núcleo de ferrite |  |

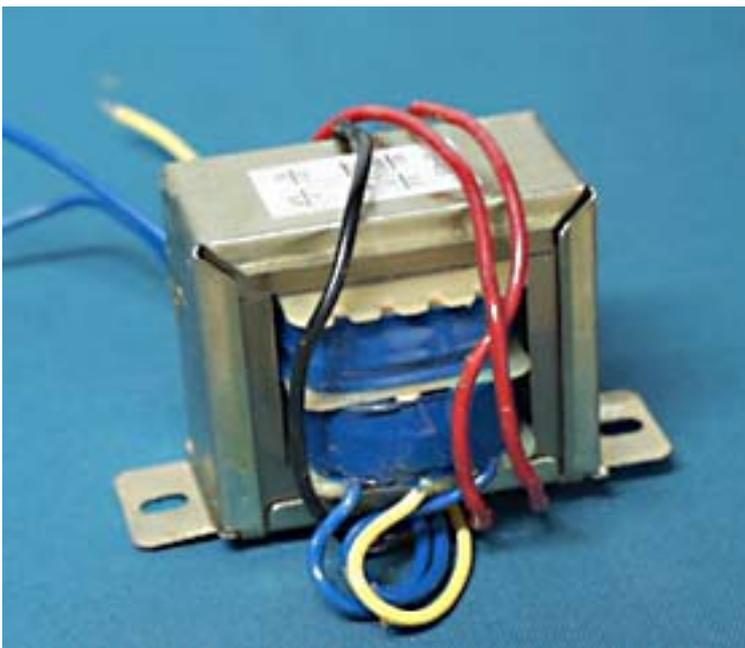
EXEMPLOS DE BOBINAS

| | |
|-------------------|--|
| NÚCLEO DE FERRITE |  |
| NÚCLEO DE FERRITE |  |
| NÚCLEO DE AR |  |

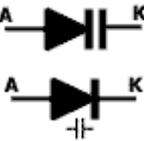
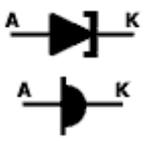
TRANSFORMADORES

| | | | |
|-------------------------------------|---|-----------------------------------|---|
| Transformador com núcleo de ar |  | Transformador com núcleo de ferro |  |
| Transformador com núcleo de ferrite |  | | |

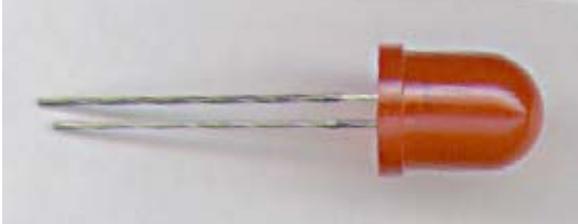
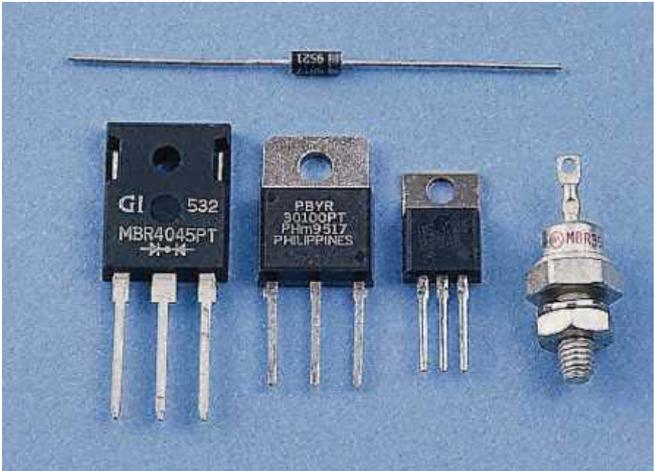
EXEMPLO DE TRANSFORMADOR



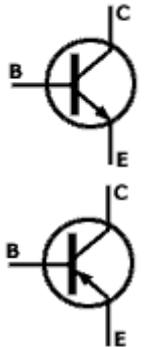
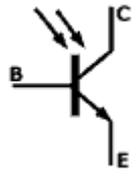
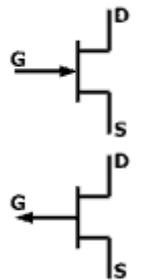
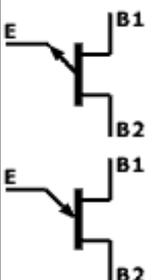
DIODOS

| | | | |
|-------------------|---|--|---|
| Diodo retificador |  | Diodo Zener |  |
| Diodo VARICAP |  | Diodo túnel |  |
| Fotodiodo |  | Diodo emissor de luz (LED) |  |
| Diodo Schottky |  | Diodo com característica dependente da temperatura |  |

TIPOS DE DIODOS

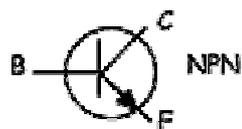
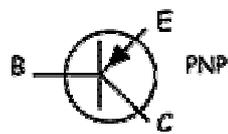
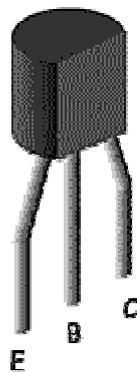
| | |
|----------------|--|
| DIODOS |  |
| DIODO ZENER |  |
| LED |  |
| Diodo Schottky |  |

TRANSISTORES

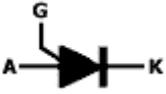
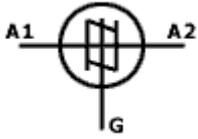
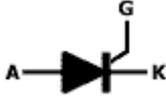
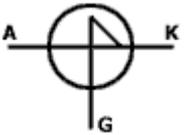
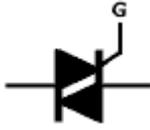
| | | | |
|--|---|--------------------------------------|---|
| <p>Transistor bipolar</p> |  | <p>Fototransistor NPN</p> |  |
| <p>Transistor de efeito de campo (FET)</p> |  | <p>Transistor de unijunção (UJT)</p> |  |

EXEMPLO DE TRANSISTOR

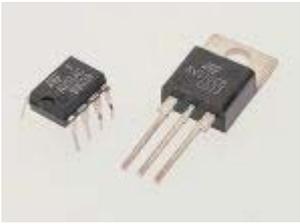
TO-92



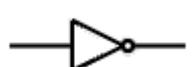
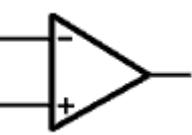
TIRISTORES

| | | | |
|---------------|---|----------------|---|
| Tiristor PUT |  | Tiristor SBS |  |
| Tiristor DIAC |  | Tiristor SCR |  |
| Tiristor SUS |  | Tiristor TRIAC |  |

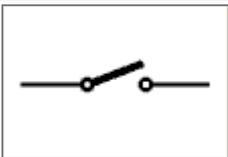
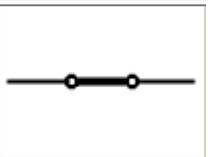
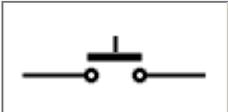
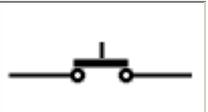
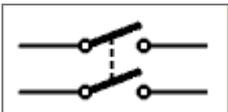
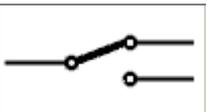
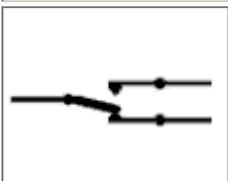
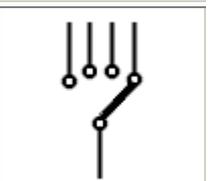
EXEMPLOS DE TIRISTORES

| | | | | |
|--------|---|---|--|---|
| SCRs |  |  |  |  |
| TRIACs |  |  |  |  |
| DIAC's |  | | | |

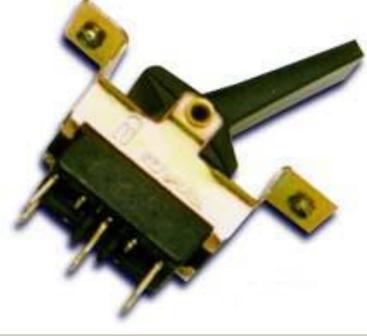
PORTAS LÓGICAS

| | | | |
|--------------------------|---|--------------|--|
| Porta AND |  | Porta NOR |  |
| Porta NAND |  | Porta EX-OR |  |
| Porta OR |  | Porta EX-NOR |  |
| Porta inversora |  | Buffer |  |
| Amplificador operacional |  | Flip-Flop |  |

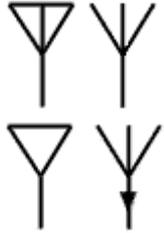
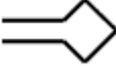
INTERRUPTORES

| | | | |
|-----------------------------------|---|------------------------------------|--|
| Chave de contato simples (aberta) |  | Chave de contato simples (fechada) |  |
| Botão de pressão (aberto) |  | Botão de pressão (fechado) |  |
| Chave de contato dupla (aberta) |  | Chave seletora de 2 posições |  |
| Comutador |  | Chave seletora múltipla |  |

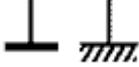
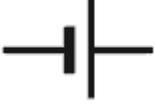
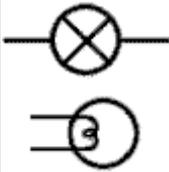
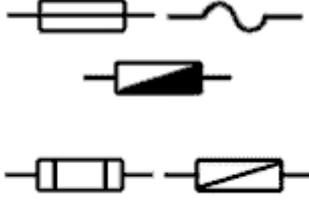
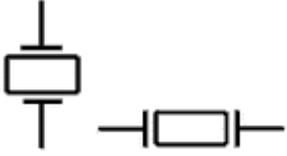
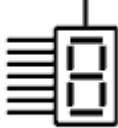
EXEMPLOS DE INTERRUPTORES

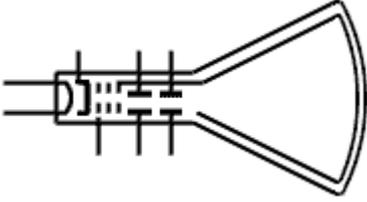
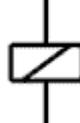
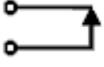
| | | | |
|--------------------------|---|--------------------------|--|
| Chave bipolar 3 contatos |  | Chave Push-button |  |
| Chave bipolar 3 contatos |  | Chave bipolar 6 contatos |  |
| Chave de força |  | | |

ANTENAS

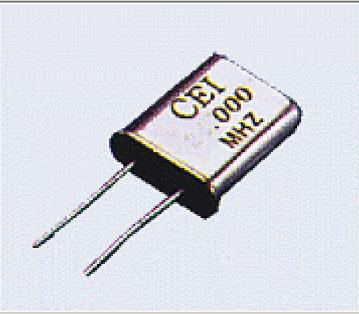
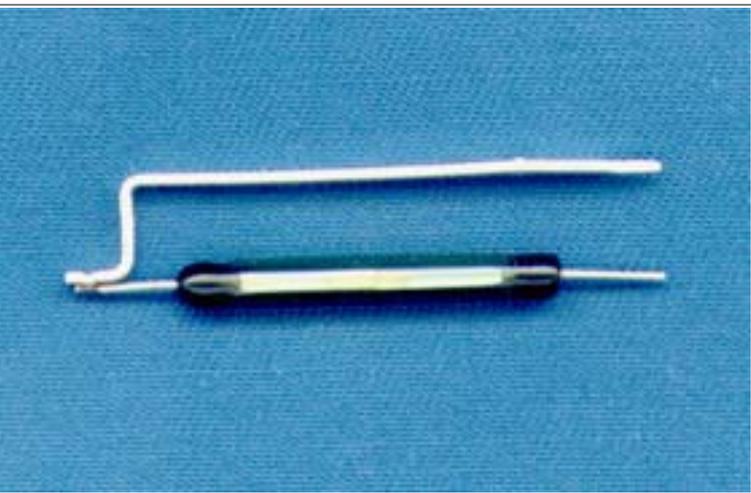
| | | | |
|-----------------------------------|---|---------------------|--|
| Antena receptora |  | Antena transmissora |  |
| Antena de quadro |  | Satélite |  |
| Antena bipolo simples de recepção |  | | |

DIVERSOS

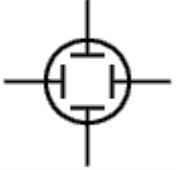
| | | | |
|---------------------|---|-----------------------|--|
| Nó |  | Cruzamento |  |
| Terra |  | Massa |  |
| Fonte de CC |  | Fonte de CA |  |
| Lampada |  | Fusível |  |
| Alto-falante |  | Microfone |  |
| Sirene |  | Cristal Piezoelétrico |  |
| Display 7 segmentos |  | Display 16 segmentos |  |

| | | | |
|-----------------------|---|-------------------------------|--|
| Motor |  | Tubo de raios catódicos (CRT) |  |
| Relé |  | Reed Switch |  |
| Relé (Contato aberto) |  | Relé (Contato fechado) |  |

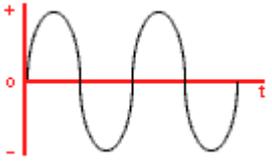
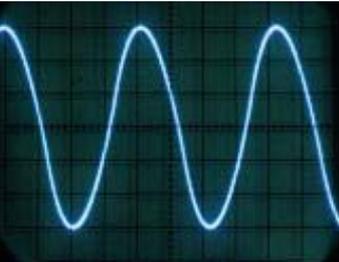
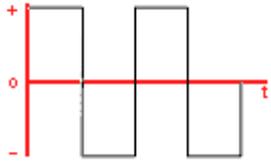
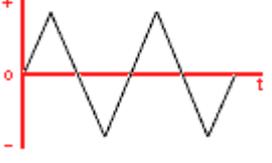
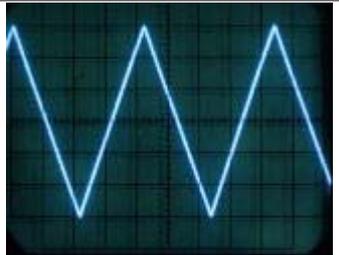
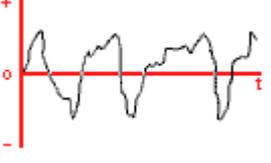
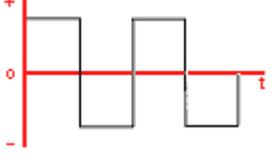
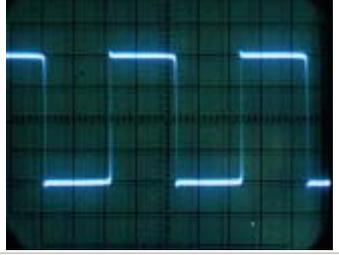
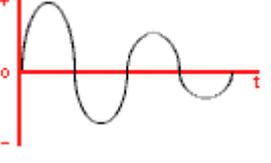
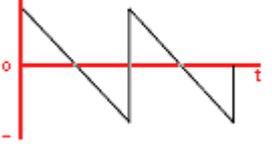
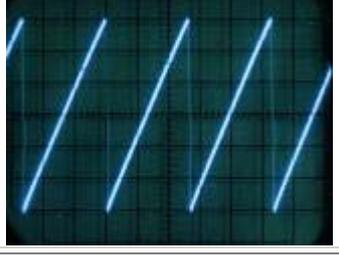
EXEMPLOS DE COMPONENTES VARIADOS

| | |
|-----------------------|--|
| Cristal piezoelétrico |  |
| Reed Switch |  |
| Fusível |  |

INSTRUMENTOS DE MEDIÇÃO

| | | | | |
|--------------|---|--|----------------|---|
| Amperímetro |  | | Voltímetro |  |
| Ohmímetro |  | | Frequencímetro |  |
| Galvanômetro |  | | Vatímetro |  |
| Osciloscópio |  | | | |

TIPOS DE ONDAS

| | | | | |
|---------------------|---|---|--------------------|--|
| Senoidal |  <p>A graph showing a smooth, periodic sine wave oscillating around a horizontal zero axis. The vertical axis is labeled with +, 0, and -.</p> |  <p>An oscilloscope trace of a sine wave, appearing as a glowing blue line on a dark grid background.</p> | Retangular |  <p>A graph showing a square wave that alternates between positive and negative constant values over time. The vertical axis is labeled with +, 0, and -.</p> |
| Triangular |  <p>A graph showing a periodic wave with linear ramps up and down, forming a triangular shape. The vertical axis is labeled with +, 0, and -.</p> |  <p>An oscilloscope trace of a triangular wave, appearing as a glowing blue line on a dark grid background.</p> | Sonora |  <p>A graph showing a complex periodic wave with multiple peaks and troughs, characteristic of a sound wave. The vertical axis is labeled with +, 0, and -.</p> |
| Quadrada |  <p>A graph showing a square wave that alternates between positive and negative constant values over time. The vertical axis is labeled with +, 0, and -.</p> |  <p>An oscilloscope trace of a square wave, appearing as a glowing blue line on a dark grid background.</p> | Amortizada |  <p>A graph showing a sine wave whose amplitude decreases over time, representing a damped oscillation. The vertical axis is labeled with +, 0, and -.</p> |
| Dente de serra |  <p>A graph showing a periodic wave with linear ramps up and down, forming a sawtooth shape. The vertical axis is labeled with +, 0, and -.</p> |  <p>An oscilloscope trace of a sawtooth wave, appearing as a glowing blue line on a dark grid background.</p> | | |
| Frequência Modulada |  <p>A graph showing a wave whose frequency varies periodically over time. The vertical axis is labeled with +, 0, and -.</p> | | Amplitude Modulada |  <p>A graph showing a wave whose amplitude varies periodically over time, creating a series of pulses. The vertical axis is labeled with +, 0, and -.</p> |