Technician Licensing Class

Electrical components, semiconductors, circuit diagrams, component functions

T6A - T6D

Valid
July 1, 2018 Through June 30, 2022

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updated to 2018 Question Pool by NQ4K for Sterling Park Amateur Radio Club

T 6 A
Topics

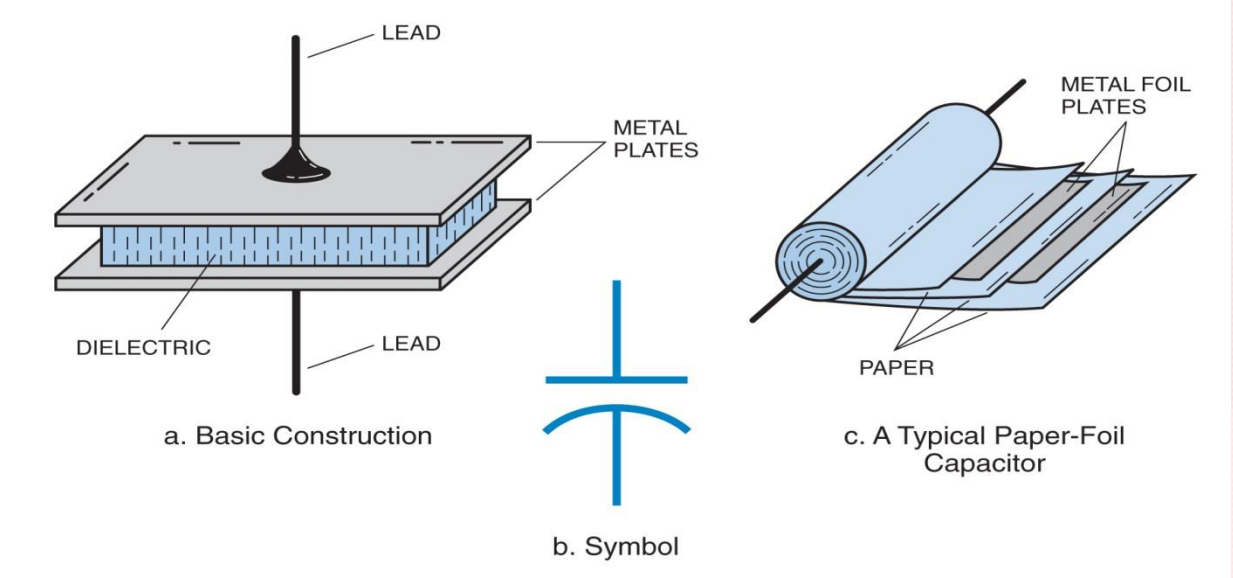
- Electrical components:
  - fixed and variable resistors;
  - capacitors and inductors;
  - fuses;
  - switches;
  - batteries

T 6 A

- The electrical component which opposes the flow of current in a DC circuit is the resistor. T6A01
- The component often used as an adjustable volume control is the potentiometer. T6A02
- The electrical parameter controlled by a potentiometer is resistance. T6A03

T 6 A

- The electrical component that stores energy in an electric field is the capacitor. T6A04
- The type of electrical component that consists of two or more conductive surfaces separated by an insulator is a capacitor. T6A05



T 6 A

- The electrical component that stores energy in a magnetic field is an inductor. T6A06

- The electrical component usually composed of a coil of wire is an inductor. T6A07

T 6 A

- The electrical component used to connect or disconnect electrical circuits is the switch. T6A08

- The electrical component used to protect other circuit components from current overload is the fuse. T6A09

T 6 A

- These battery types are rechargeable:
  - Nickel-metal hydride;
  - Lithium-ion;
  - Lead-acid gel-cell

    ✓ All of these choices are correct. T6A10

- This type of battery is not rechargeable: Carbon-zinc. T6A11

T 6 B
Topics

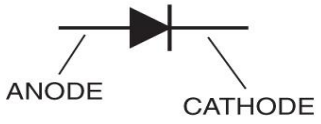
- Semiconductors:
  - basic principles and applications of solid state devices;
  - diodes and transistors

T 6 B

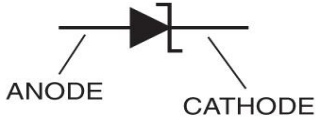
- The class of electronic components that uses a voltage or current signal to control current flow are transistors. T6B01
- The electronic component that allows current to flow in only one direction is the diode. T6B02
- The component that can be used as an electronic switch or amplifier is the transistor. T6B03

T 6 B

- The component that consists of three layers of semiconductor material is the transistor. T6B04
- The transistor is an electronic component that can amplify signals. T6B05
- The cathode lead of a semiconductor diode is usually identified with a stripe. T6B06



Here is the schematic symbol of a diode. Current will only flow ONE WAY in a diode. You can remember this diode diagram as a one-way arrow (key words).

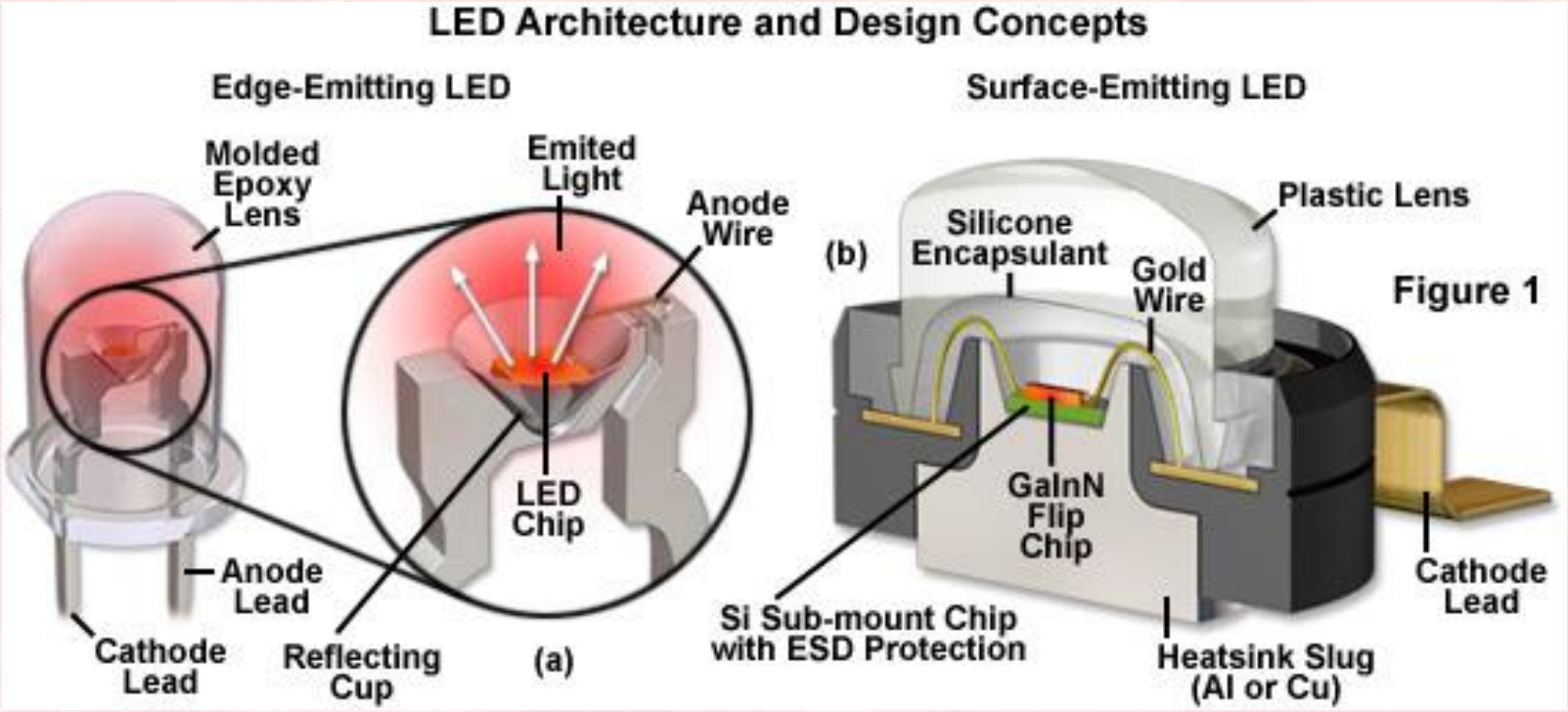


Here is the schematic symbol of a Zener diode. Since a diode only passes energy in one direction, look for that one-way arrow, plus a “Z” indicating it is a Zener diode. Doesn't that vertical line look like a tiny “Z”?

T 6 B

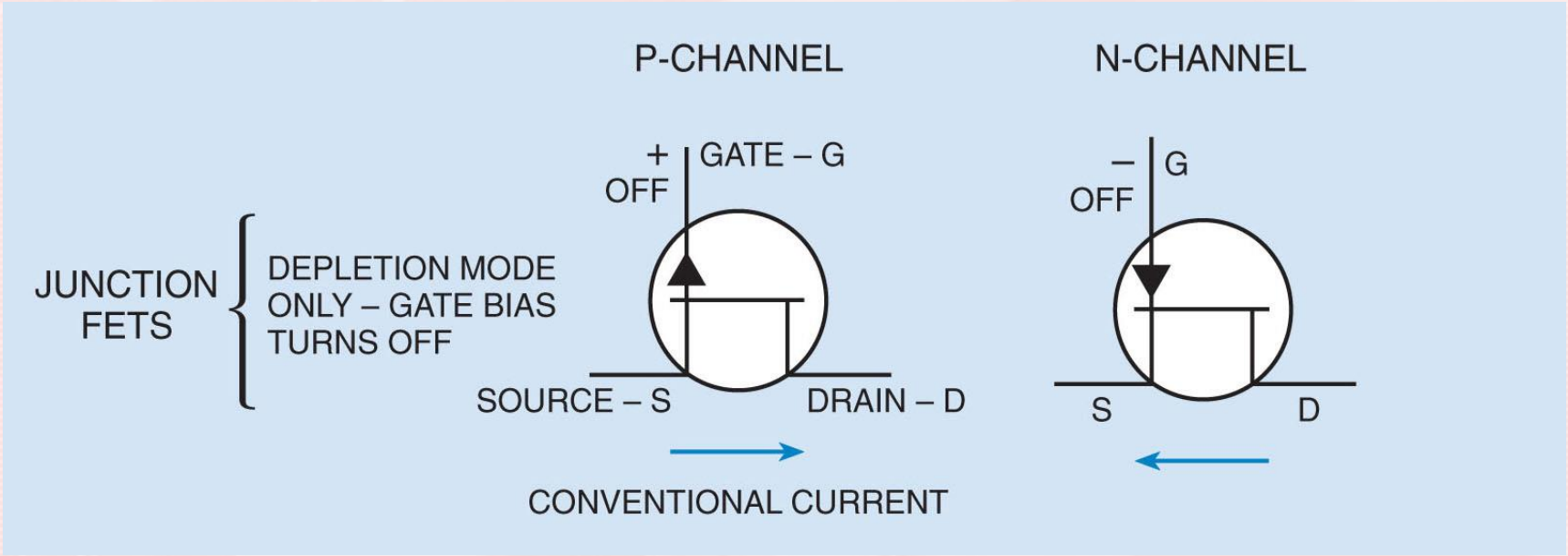
- The abbreviation LED stands for Light Emitting Diode.

T6B07



T 6 B

- The abbreviation FET stands for Field Effect Transistor.
T6B08



T 6 B

- The two electrodes of a diode are the anode and cathode. T6B09

- The primary gain-producing component in an RF power amplifier is the transistor. T6B10

- The term that describes a transistor's ability to amplify a signal is gain. T6B11

T 6 C
Topics

- Circuit diagrams;
  - schematic symbols

T 6 C

- The name of an electrical wiring diagram that uses standard component symbols is a schematic. T6C01

T 6 C

- Component #1 in Figure T1 is a Resistor T6C02

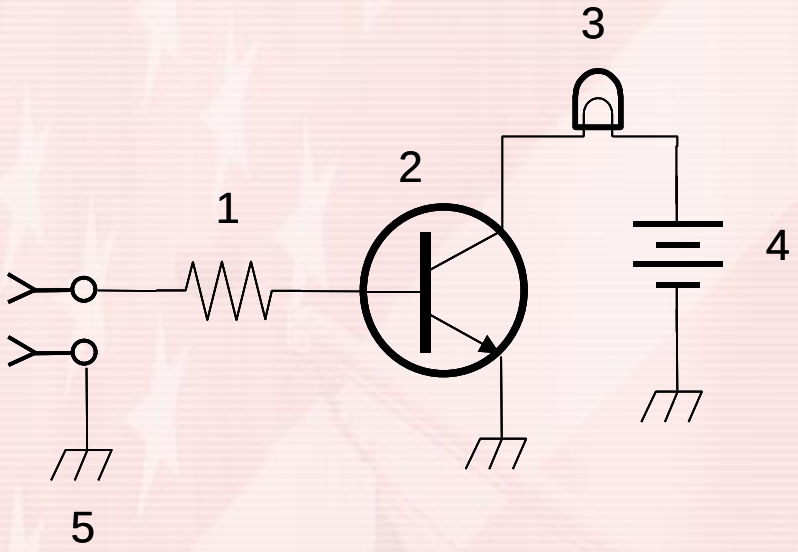


Figure T1

- Component #2 in Figure T1 is a Transistor. T6C03

T 6 C

- Component #3 in Figure T1 is a Lamp. T6C04

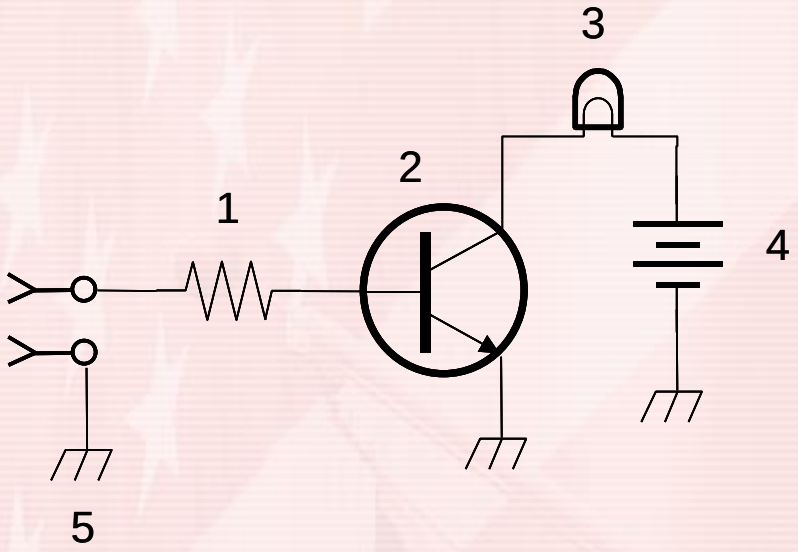


Figure T1

- Component #4 in Figure T1 is a Battery. T6C05

T 6 C

- Component #6 in Figure T2 is a capacitor. T6C06

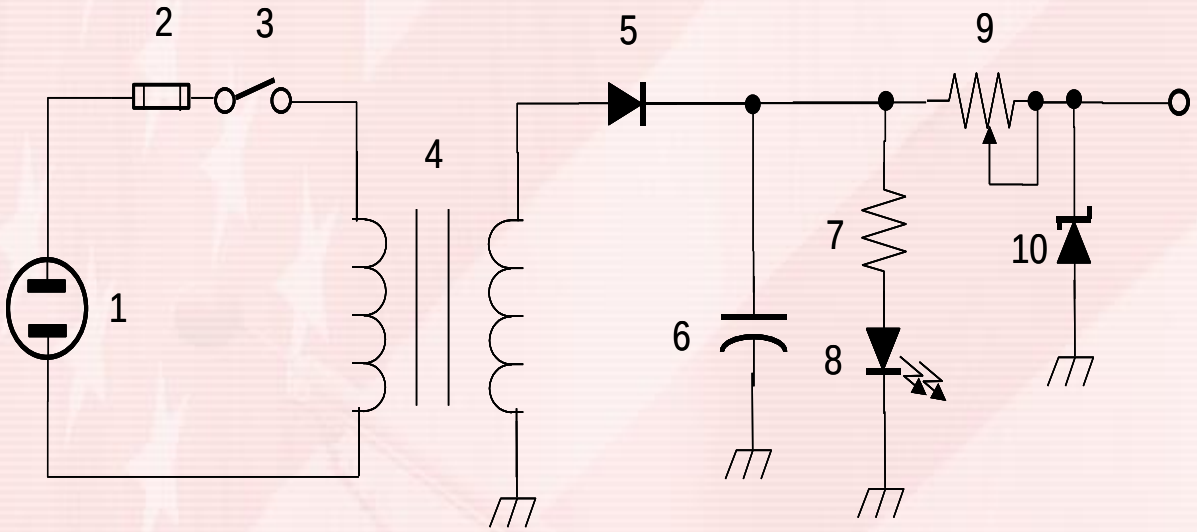


Figure T2

- Component #8 in Figure T2 is a light emitting diode. T6C07
- Component #9 in Figure T2 is a variable resistor. T6C08

T 6 C

- Component #4 in Figure T2 is a transformer. T6C09

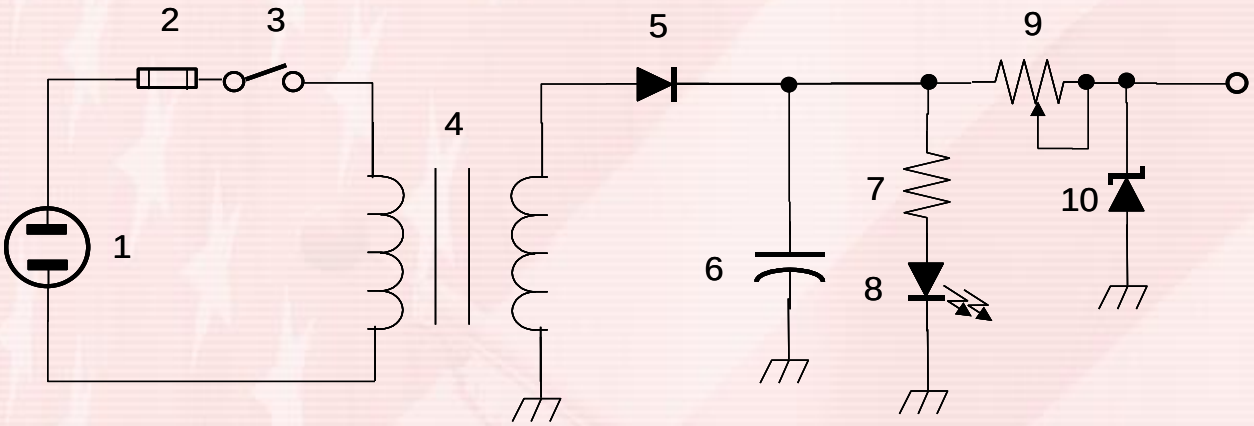


Figure T2

T 6 C

- The component #3 in figure T3 is a variable inductor. T6C10

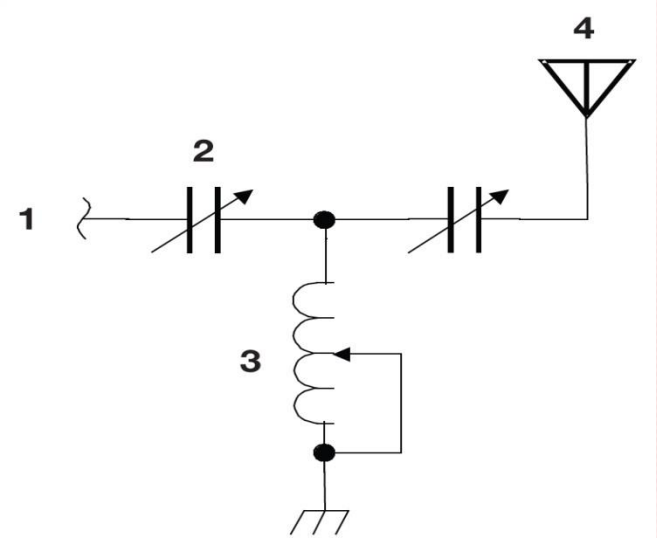


Figure T3

- The component #4 in figure T3 is an antenna. T6C11

T 6 C

- The symbols on an electrical circuit schematic diagram represent electrical components. T6C12
- The way components are interconnected is accurately represented in electrical circuit schematic diagrams. T6C13

T 6 D
Topics

- Component functions:
  - rectification;
  - switches;
  - indicators;
  - power supply components;
  - resonant circuit;
  - shielding;
  - power transformers;
  - integrated circuits

T 6 D

- The device or circuit that changes an alternating current in to a varying direct current signal is the rectifier. T6D01
- A switch controlled by an electromagnet is a relay. T6D02
- Component #3 in Figure T2 is a single-pole, single-throw switch. T6D03

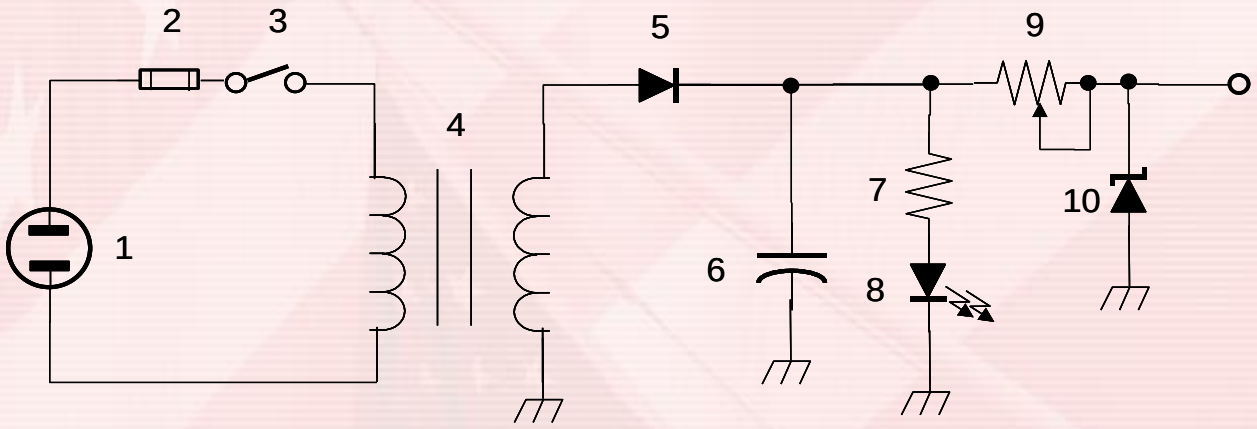


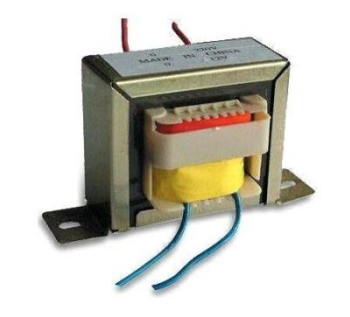
Figure T2

T 6 D

- A meter can be used to display signal strength on a numeric scale. T6D

- A regulator is a type of circuit that controls the amount of voltage from a power supply. T6D05

- The component commonly used to change 120V AC house current to a lower AC voltage for other uses is a transformer. T6D06



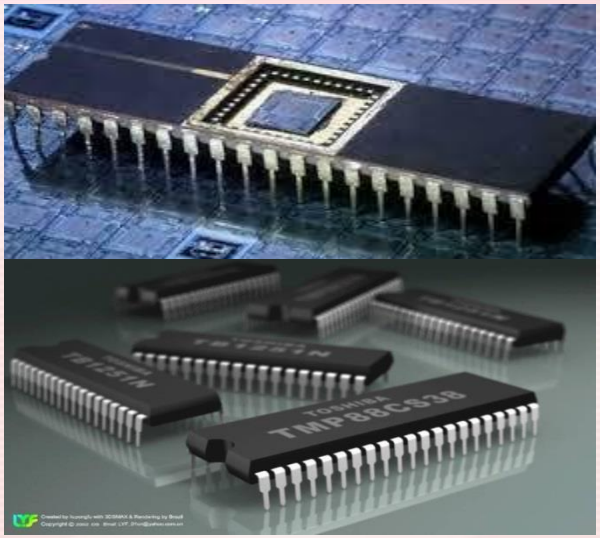
T 6 D

- A device commonly used as a visual indicator is an LED. T6D07

- A capacitor is used together with an inductor to make a tuned circuit. T6D08

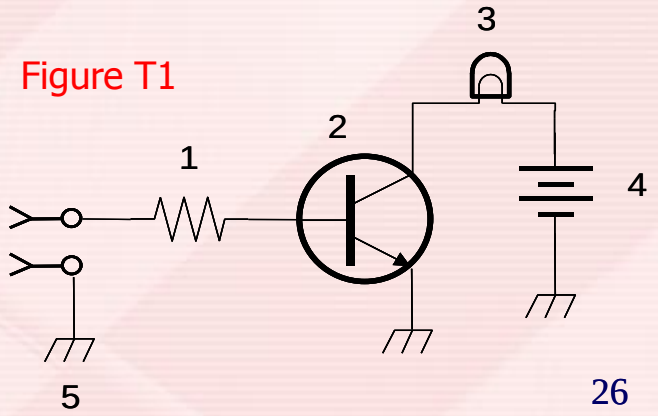
T 6 D

- The device that combines several semiconductors and other components into one package is an integrated circuit. T6D09



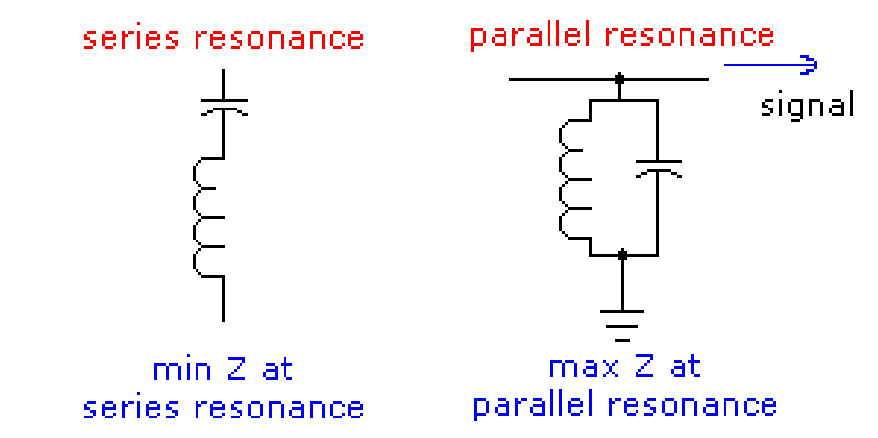
- The function of component #2 in Figure T1 is to control the flow of current. T6D10

Figure T1



T 6 D

- A simple resonant or tuned circuit consists of an inductor and a capacitor connected in series or parallel to form a filter. T6D11



- A common reason to use shielded wire is to prevent coupling of unwanted signals to or from the wire. T6D12

Element 2 Technician Class Question Pool

T 6 A – T 6 D

T6A01 What electrical component opposes the flow of current in a DC circuit?

A. Inductor

B. Resistor

C. Voltmeter

D. Transformer

T6A02 What type of component is often used as an adjustable volume control?

A. Fixed resistor

B. Power resistor

C. Potentiometer

D. Transformer

T6A03 What electrical parameter is controlled by a potentiometer?

A. Inductance

B. Resistance

C. Capacitance

D. Field strength

T6A04 What electrical component stores energy in an electric field?

A. Resistor

B. Capacitor

C. Inductor

D. Diode

T6A05 What type of electrical component consists of two or more conductive surfaces separated by an insulator?

A. Resistor

B. Potentiometer

C. Oscillator

D. Capacitor

T6A06 What type of electrical component stores energy in a magnetic field?

A. Resistor

B. Capacitor

C. Inductor

D. Diode

T6A07 What electrical component is usually composed of a coil of wire?

A. Switch

B. Capacitor

C. Diode

D. Inductor

T6A08 What electrical component is used to connect or disconnect electrical circuits?

A. Magnetron

B. Switch

C. Thermistor

D. All of these choices are correct

T6A09 What electrical component is used to protect other circuit components from current overloads?

A. Fuse

B. Capacitor

C. Inductor

D. All of these choices are correct

T6A10 Which of the following battery types is rechargeable?

A. Nickel-metal hydride

B. Lithium-ion

C. Lead-acid gel-cell

D. All of these choices are correct

T6A11 Which of the following battery types is not rechargeable?

A. Nickel-cadmium

B. Carbon-zinc

C. Lead-acid

D. Lithium-ion

T6B01 What class of electronic components is capable of using a voltage or current signal to control current flow?

A. Capacitors

B. Inductors

C. Resistors

D. Transistors

T6B02 What electronic component allows current to flow in only one direction?

A. Resistor

B. Fuse

C. Diode

D. Driven element

T6B03 Which of these components can be used as an electronic switch or amplifier?

A. Oscillator

B. Potentiometer

C. Transistor

D. Voltmeter

T6B04 Which of the following components can consist of three layers of semiconductor material?

A. Alternator

B. Transistor

C. Triode

D. Pentagrid converter

T6B05 Which of the following electronic components can amplify signals?

A. Transistor

B. Variable resistor

C. Electrolytic capacitor

D. Multi-cell battery

T6B06 How is cathode lead of a semiconductor diode often marked on the package?

A. With the word “cathode”

B. With a stripe

C. With the letter C

D. With the letter K

T6B07 What does the abbreviation "LED" stand for?

A. Low Emission Diode

B. Light Emitting Diode

C. Liquid Emission Detector

D. Long Echo Delay

T6B08 What does the abbreviation FET stand for?

A. Field Effect Transistor

B. Fast Electron Transistor

C. Free Electron Transition

D. Field Emission Thickness

T6B09 What are the names of the two electrodes of a diode?

A. Plus and minus

B. Source and drain

C. Anode and cathode

D. Gate and base

T6B10 Which of the following could be the primary gain-producing component in an RF power amplifier?

A. Transformer

B. Transistor

C. Reactor

D. Resistor

T6B11 What is the term that describes a transistor's ability to amplify a signal?

A. Gain

B. Forward resistance

C. Forward voltage drop

D. On resistance

T6C01 What is the name of an electrical wiring diagram that uses standard component symbols?

A. Bill of materials

B. Connector pinout

C. Schematic

D. Flow chart

T6C02 What is component 1 in figure T1?

A. Resistor
B. Transistor
C. Battery
D. connector

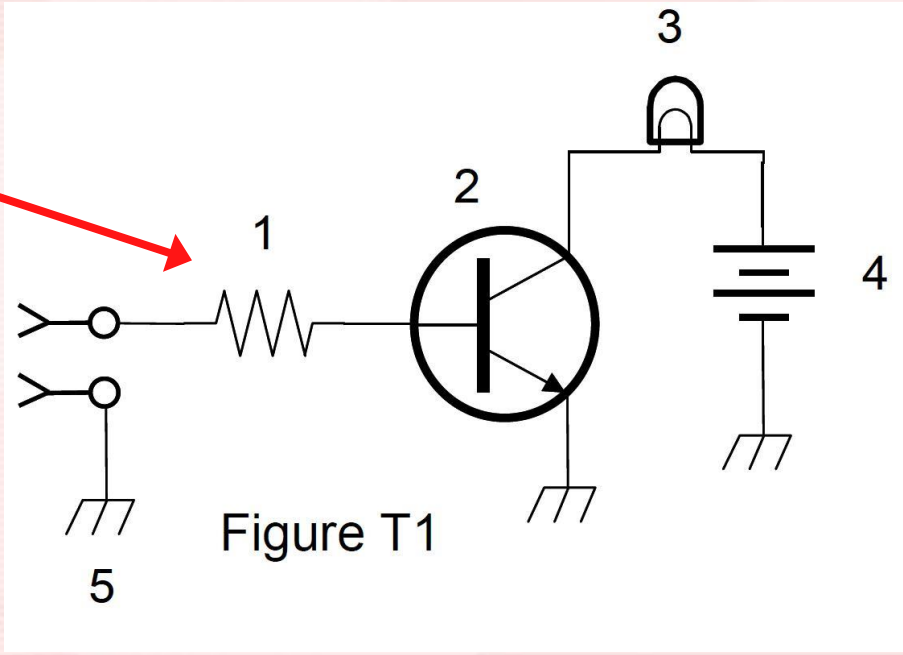


Figure T1

T6C03 What is component 2 in figure T1?

A. Resistor
B. Transistor
C. Indicator lamp
D. Connector

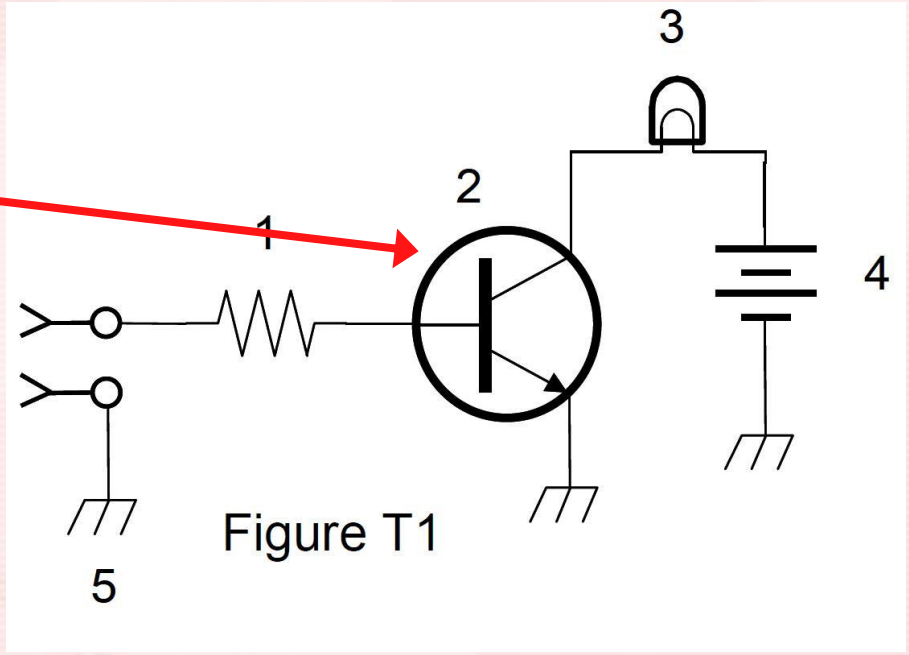


Figure T1

T6C04 What is component 3 in figure T1?

A. Resistor
B. Transistor
C. Lamp
D. Ground symbol

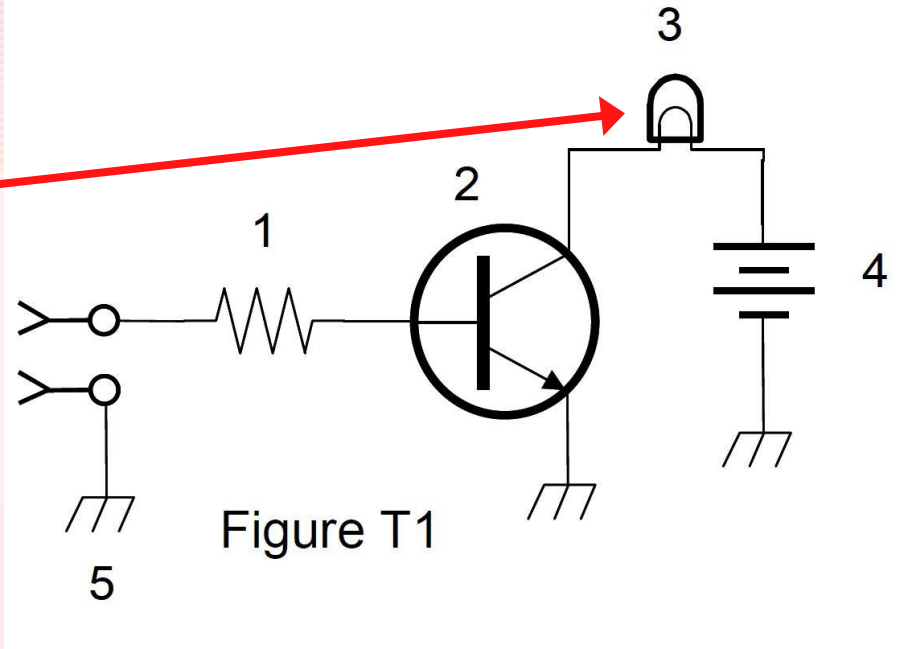


Figure T1

T6C05 What is component 4 in figure T1?

A. Resistor
B. Transistor
C. Battery
D. Ground symbol

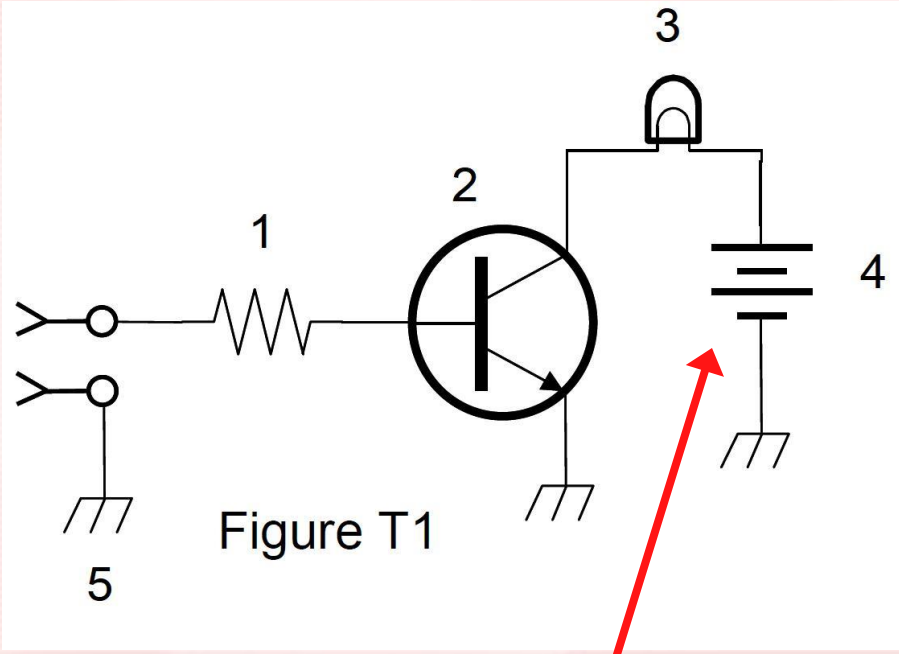


Figure T1

T6C06 What is component 6 in figure T2?

A. Resistor
B. Capacitor
C. Regulator IC
D. Transistor

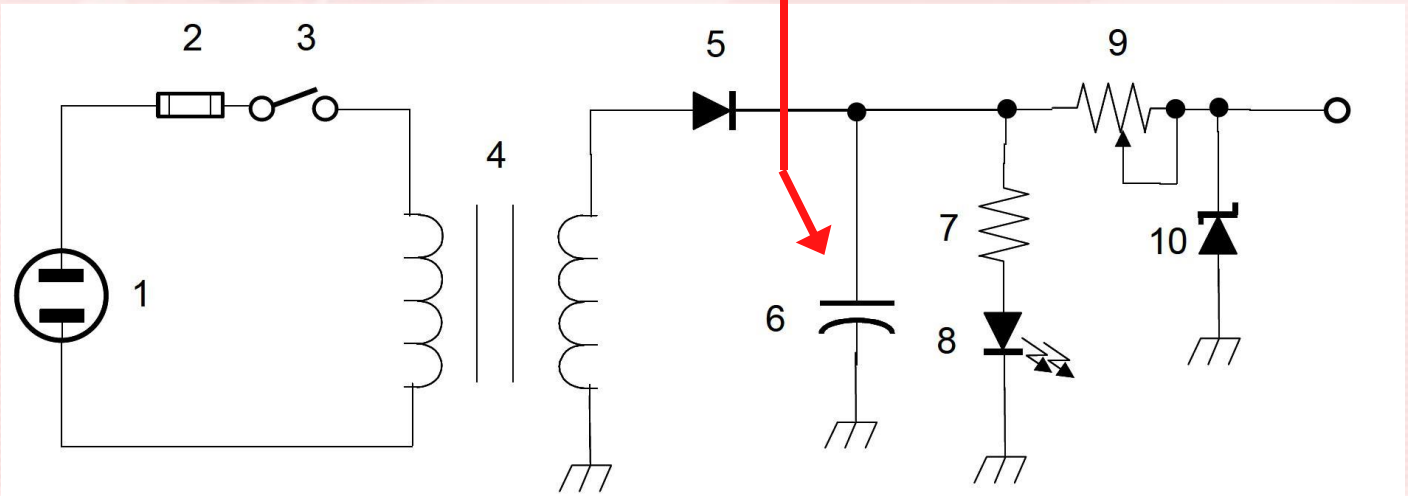


Figure T2

T6C07 What is component 8 in figure T2?

A. Resistor
B. Inductor
C. Regulator IC
D. Light emitting diode

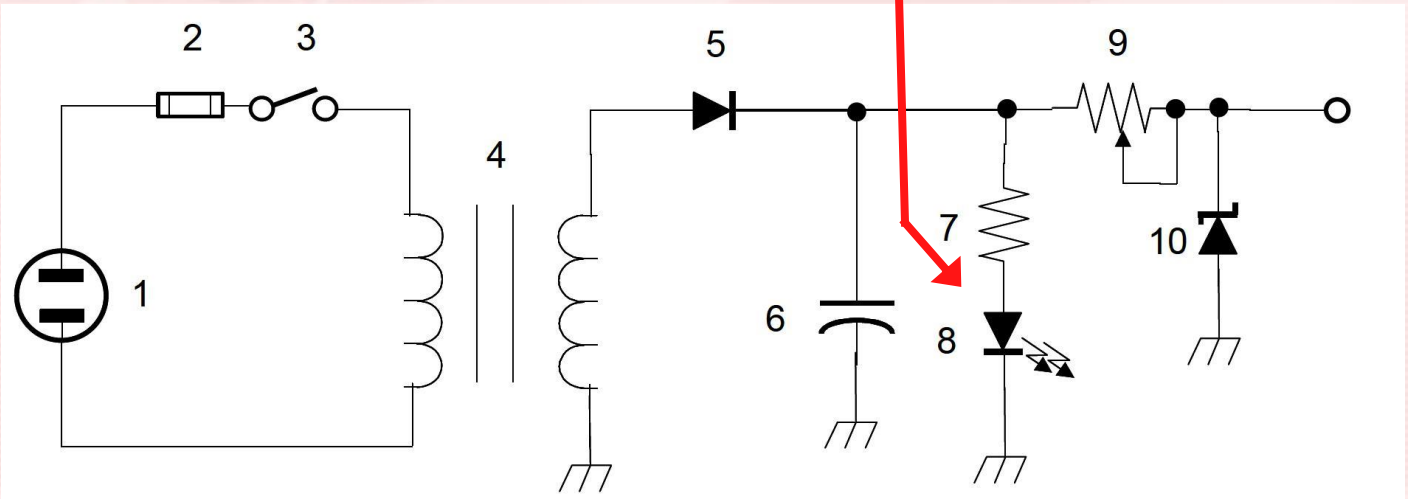


Figure T2

T6C08 What is component 9 in figure T2?

A. Variable capacitor
B. Variable inductor
C. Variable resistor
D. Variable transformer

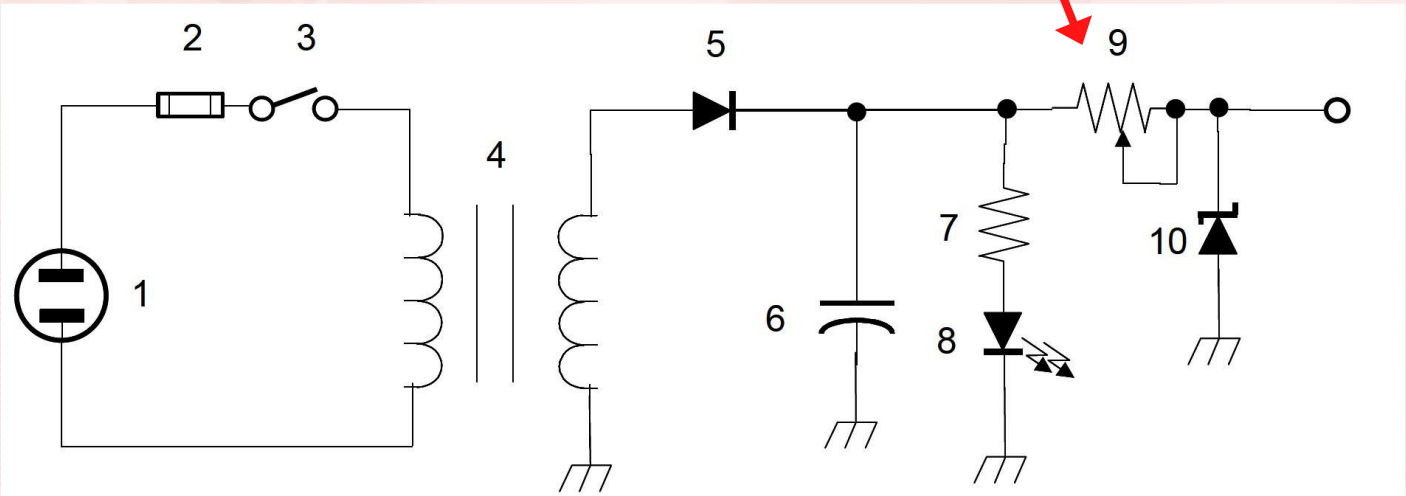


Figure T2

T6C09 What is component 4 in figure T2?

A. Variable inductor
B. Double-pole switch
C. Potentiometer
D. Transformer

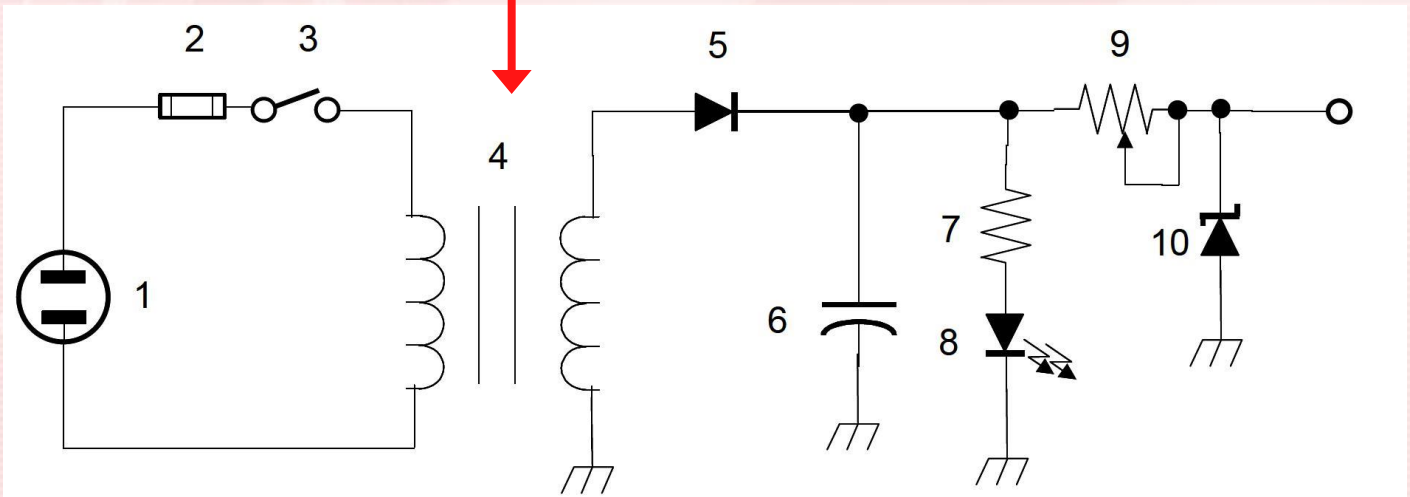


Figure T2

T6C10 What is component 3 in figure T3?

A. Connector
B. Meter
C. Variable capacitor
D. Variable inductor

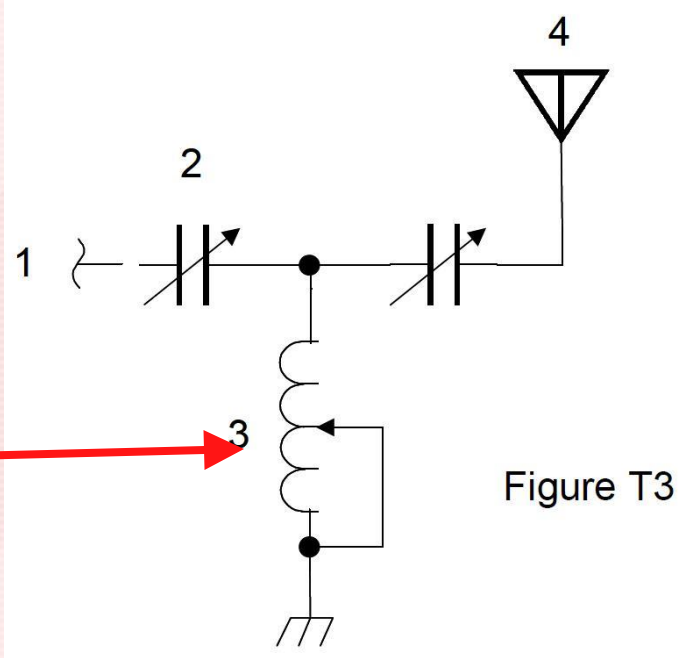


Figure T3

T6C11 What is component 4 in figure T3?

A. Antenna
B. Transmitter
C. Dummy load
D. Ground

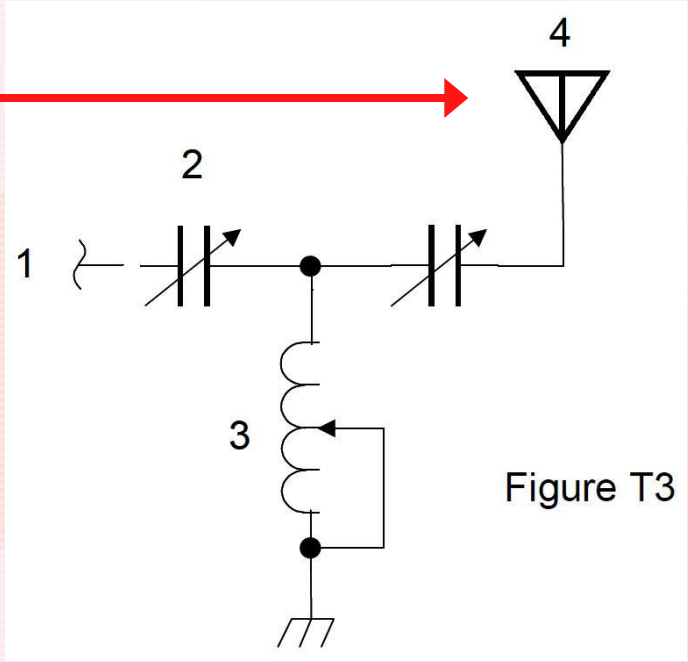


Figure T3

T6C12 What do the symbols on an electrical circuit schematic represent?

A. Electrical components

B. Logic states

C. Digital codes

D. Traffic nodes

T6C13 Which of the following is accurately represented in electrical circuit schematic diagrams?

A. Wire lengths
B. Physical appearance of components
C. The way components are interconnected
D. All of these choices

T6D01 Which of the following devices or circuits changes an alternating current into a varying direct current signal?

A. Transformer

B. Rectifier

C. Amplifier

D. Reflector

T6D02 What is a relay?

A. A switch controlled by an electromagnet

B. A current controlled amplifier

C. An optical sensor

D. A pass transistor

T6D03 What type of switch is represented by item 3 in figure T2?

A. Single-pole single-throw
B. Single-pole double-throw
C. Double-pole single-throw
D. Double-pole double-throw

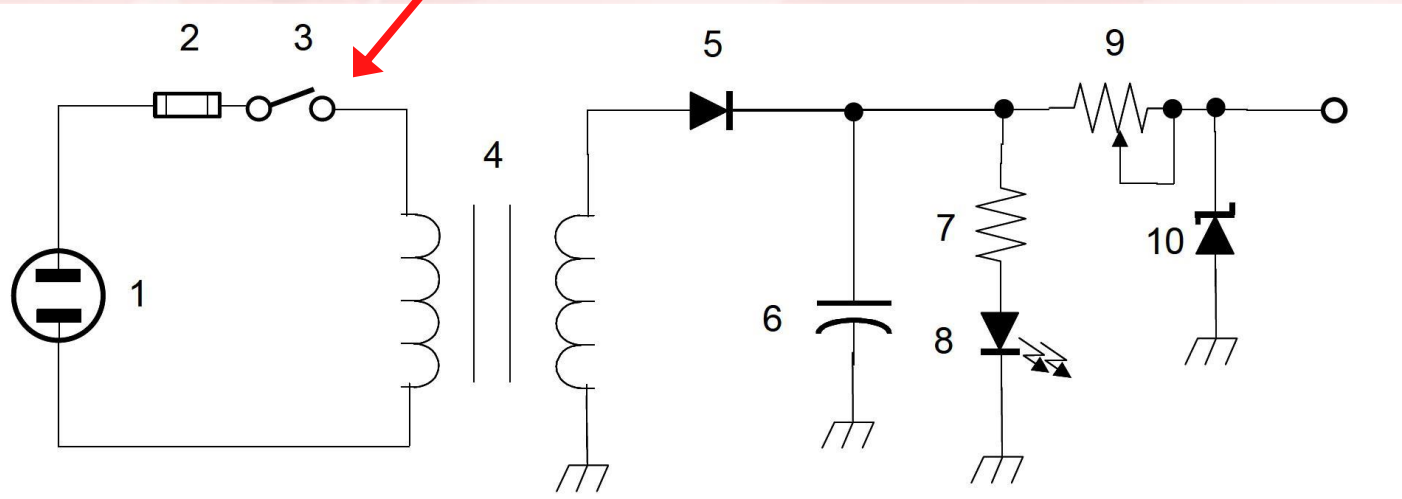


Figure T2

T6D04 Which of the following displays an electrical quantity as a numeric value?

A. Potentiometer

B. Transistor

C. Meter

D. Relay

T6D05 What type of circuit controls the amount of voltage from a power supply?

A. Regulator

B. Oscillator

C. Filter

D. Phase inverter

T6D06 What component is commonly used to change 120V AC house current to a lower AC voltage for other uses?

A. Variable capacitor

B. Transformer

C. Transistor

D. Diode

T6D07 Which of the following is commonly used as a visual indicator?

A. LED

B. FET

C. Zener diode

D. Bipolar transistor

T6D08 Which of the following is combined with an inductor to make a tuned circuit?

A. Resistor

B. Zener diode

C. Potentiometer

D. Capacitor

T6D09 What is the name of a device that combines several semiconductors and other components into one package?

A. Transducer

B. Multi-pole relay

C. Integrated circuit

D. Transformer

T6D10 What is the function of component 2 in Figure T1?

A. Give off light when current flows through it
B. Supply electrical energy
C. Control the flow of current
D. Convert electrical energy into radio waves

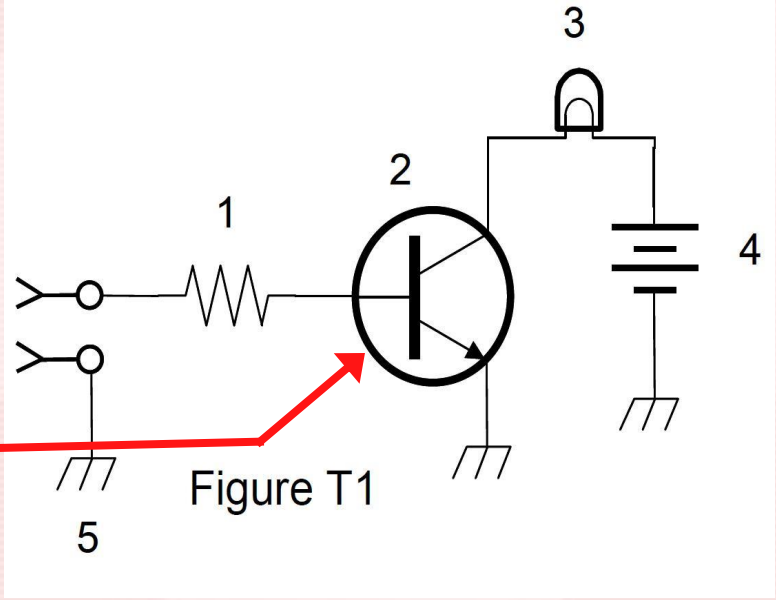


Figure T1

T6D11 What of the following is a resonant or tuned circuit?

A. An inductor and a capacitor connected in series or parallel to form a filter

B. A type of voltage regulator

C. A resistor circuit used for reducing standing wave ratio

D. A circuit designed to provide high fidelity audio

T6D12 Which of the following is a common reason to use shielded wire?

A. To decrease the resistance of DC power connections

B. To increase the current carrying capability of the wire

C. To prevent coupling of unwanted signals to or from the wire

D. To couple the wire to other signals