

# Advanced Components

## Chapter G4

### Active Components, Practical Circuits, Basic Test Equipment

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### Active Components

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G6A03 -- What is the approximate junction threshold voltage of a germanium diode?

ANSWER:

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G6A05 -- What is the approximate junction threshold voltage of a conventional silicon diode?

ANSWER:

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G6A07 -- What are the stable operating points for a bipolar transistor used as a switch in a logic circuit?

ANSWER:

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G6A09 -- Which of the following describes the construction of a MOSFET?

ANSWER:

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G6A10 -- Which element of a triode vacuum tube is used to regulate the flow of electrons between cathode and plate?

ANSWER:

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G6A12 -- What is the primary purpose of a screen grid in a vacuum tube?

ANSWER:

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G6B02 -- What is meant by the term MMIC?

ANSWER:

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G6B03 -- Which of the following is an advantage of CMOS integrated circuits compared to TTL integrated circuits?

ANSWER:

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G6B04 -- What is meant by the term ROM?

ANSWER:

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G6B05 -- What is meant when memory is characterized as non-volatile?

ANSWER:

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G6B06 -- What kind of device is an integrated circuit operational amplifier?

ANSWER:

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G6B08 -- How is an LED biased when emitting light?

ANSWER:

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G6B09 -- Which of the following is a characteristic of a liquid crystal display?

ANSWER:

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G6B10 -- How does a ferrite bead or core reduce common-mode RF current on the shield of a coaxial cable?

ANSWER:

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G7A09 -- Which symbol in figure G7-1 represents a field effect transistor?

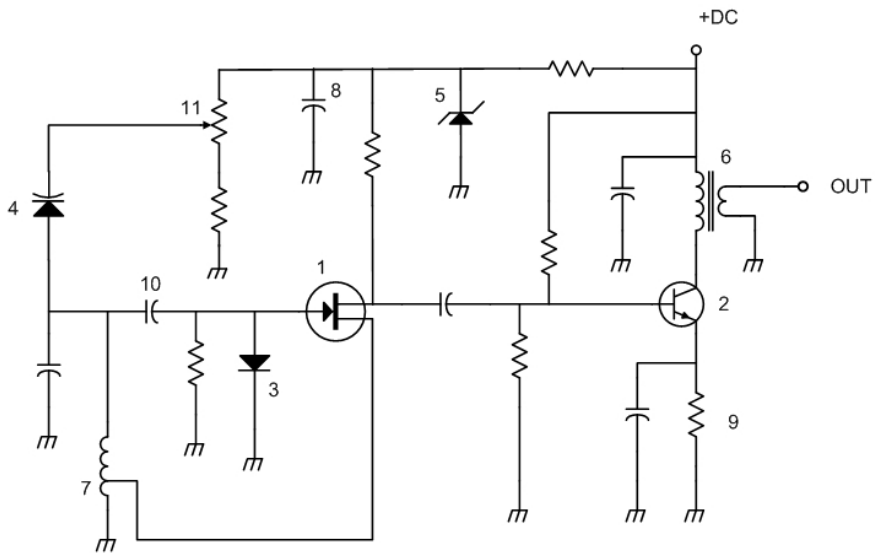


Figure G7-1

ANSWER:

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**G7A10 -- Which symbol in figure G7-1 represents a Zener diode?**

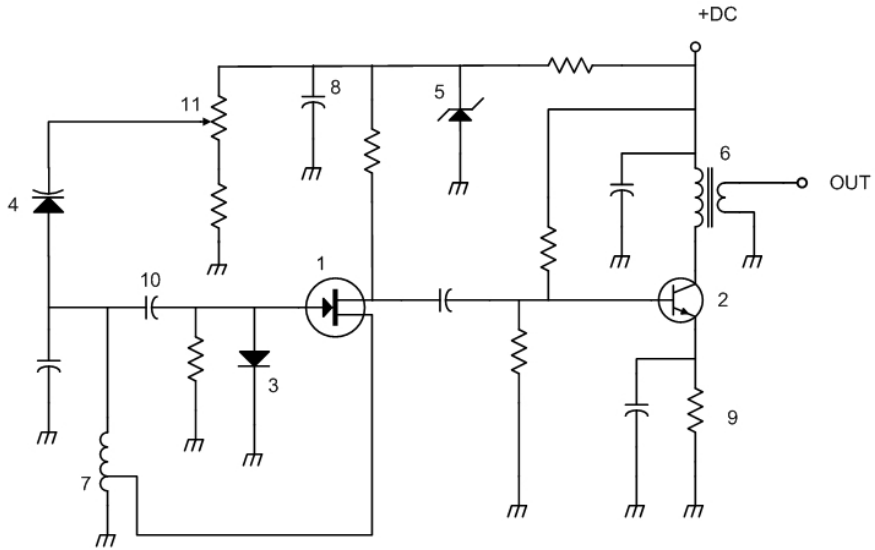


Figure G7-1

**ANSWER:**

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**G7A11 -- Which symbol in figure G7-1 represents an NPN junction transistor?**

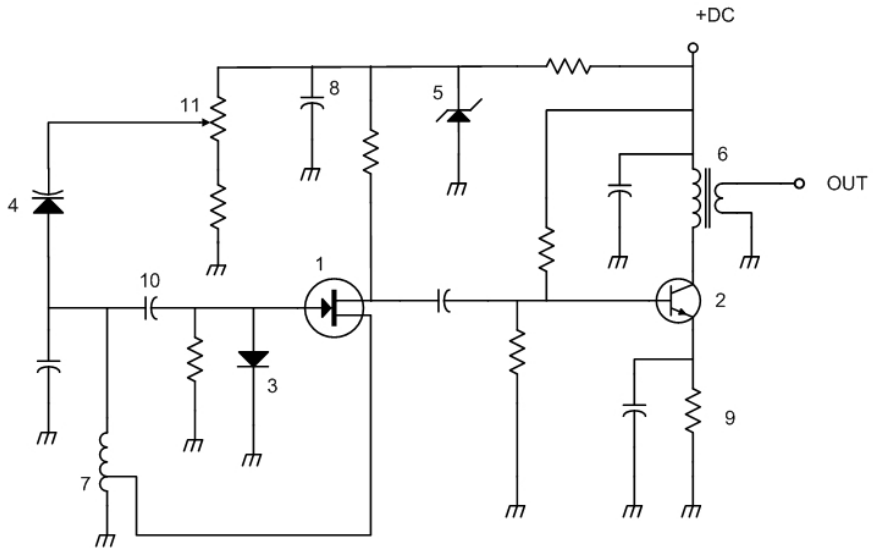


Figure G7-1

**ANSWER:**

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**G7A13 -- Which symbol in Figure G7-1 represents a tapped inductor?**

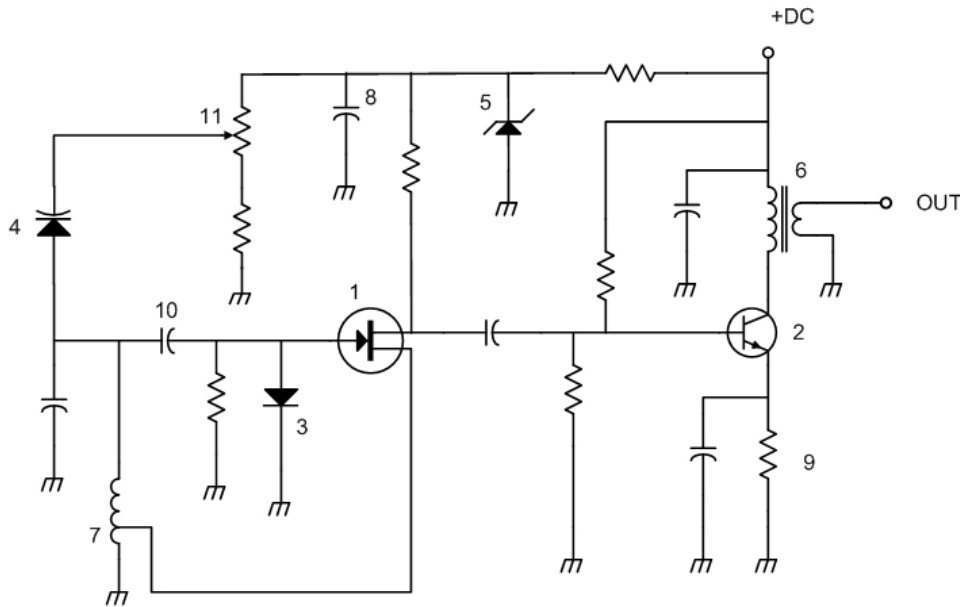


Figure G7-1

ANSWER:

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G7B03 -- Which of the following describes the function of a two-input AND gate?

ANSWER:

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G7B04 -- Which of the following describes the function of a two input NOR gate?

ANSWER:

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G7B05 -- How many states does a 3-bit binary counter have?

ANSWER:

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G7B06 -- What is a shift register?

ANSWER:

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## Practical Circuits

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G4E08 -- What is the name of the process by which sunlight is changed directly into electricity?

ANSWER:

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G4E09 -- What is the approximate open-circuit voltage from a a fully illuminated silicon photovoltaic cell?

ANSWER:

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G4E10 -- What is the reason that a series diode is connected between a solar panel and a storage battery that is being charged by the panel?

ANSWER:

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G4E11 -- Which of the following is a disadvantage of using wind as the primary source of power for an emergency station?

ANSWER:

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G6A01 -- What is the minimum allowable discharge voltage for maximum life of a standard 12 volt lead acid battery?

ANSWER:

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G6A02 -- What is an advantage of the low internal resistance of nickel-cadmium batteries?

ANSWER:

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T6A10 -- Which of the following battery types is rechargeable?

ANSWER:

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T6A11 -- Which of the following battery types is not rechargeable?

ANSWER:

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G6A04 -- When is it acceptable to recharge a carbon-zinc primary cell?

ANSWER:

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G2E12 -- Which of the following connectors would be a good choice for a serial data port?

ANSWER:

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G6B13 -- Which of these connector types is commonly used for RF service at frequencies up to 150 MHz?

ANSWER:

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G6B12 -- Which of these connector types is commonly used for audio signals in Amateur Radio stations?

ANSWER:

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G6B11 -- What is a type SMA connector?

ANSWER:

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G6B07 -- Which of the following describes a type-N connector?

ANSWER:

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G7A01 -- What useful feature does a power-supply bleeder resistor provide?

ANSWER:

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G7A02 -- Which of the following components are used in a power-supply filter network?

ANSWER:

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G7A03 -- What is the peak-inverse-voltage across the rectifiers in a full-wave bridge power supply?

ANSWER:

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G7A05 -- What portion of the AC cycle is converted to DC by a half-wave rectifier?

ANSWER:

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G7A06 -- What portion of the AC cycle is converted to DC by a full-wave rectifier?

ANSWER:

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G7A03 -- Which type of rectifier circuit uses two diodes and a center-tapped transformer?

ANSWER:

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G7A04 -- What is an advantage of a half-wave rectifier in a power supply?

ANSWER:

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G7A07 -- What is the output waveform of an unfiltered full-wave rectifier connected to a resistive load?

ANSWER:

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G7A08 -- Which of the following is an advantage of a switch-mode power supply as compared to a linear power supply?

ANSWER:

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# Basic Test Equipment

G4B01 -- What item of test equipment contains horizontal and vertical channel amplifiers?

ANSWER:

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G4B02 -- Which of the following is an advantage of an oscilloscope versus a digital voltmeter?

ANSWER:

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G4B03 -- Which of the following is the best instrument to use when checking the keying waveform of a CW transmitter?

ANSWER:

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G4B04 -- What signal source is connected to the vertical input of an oscilloscope when checking the RF envelope pattern of a transmitted signal?

ANSWER:

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T7D12 -- Which of the following precautions should be taken when measuring high voltages with a voltmeter?

ANSWER:

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G4B05 -- Why is high input impedance desirable for a voltmeter?

ANSWER:

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G4B06 -- What is an advantage of a digital voltmeter as compared to an analog voltmeter?

ANSWER:

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G4B08 -- Which of the following instruments may be used to monitor relative RF output when making antenna and transmitter adjustments?

ANSWER:

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G4B09 -- Which of the following can be determined with a field strength meter?

ANSWER:

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G4B10 -- Which of the following can be determined with a directional wattmeter?

ANSWER:

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G4B11 -- Which of the following must be connected to an antenna analyzer when it is being used for SWR measurements?

ANSWER:

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G4B12 -- What problem can occur when making measurements on an antenna system with an antenna analyzer?

ANSWER:

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G4B13 -- What is a use for an antenna analyzer other than measuring the SWR of an antenna system?

ANSWER:

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G4B14 -- What is an instance in which the use of an instrument with analog readout may be preferred over an instrument with a digital readout?

ANSWER:

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