

KNOWLEDGE PROBE 4: METAL OXIDE SEMICONDUCTOR FIELD EFFECT TRANSISTORS (MOSFETS) AND COMMON ELECTRONIC CIRCUITS

MOSFET Switches

Learning Objectives

1. Describe advantages and disadvantages to using MOSFETs.
 2. Describe basic MOSFET switching circuits with an emphasis on complementary MOS (CMOS).
1. When a MOSFET is conducting as a switch, it has a
 - a. Low capacitance
 - b. Low resistance
 - c. Very high capacitance
 - d. Very high resistance
 2. A basic N-channel E-MOSFET inverter like that shown uses a 2.5 volt power supply. The threshold value is 0.8 volts. When the input is +2.5 volts, the drain voltage will be near
 - a. +2.5 volts
 - b. 1.7 volts
 - c. 0.8 volts
 - d. Zero volts
 3. What is the purpose of the diode connected across the relay coil in a MOSFET relay driver circuit?
 - a. To minimize static electricity damage
 - b. To speed up relay turn-off
 - c. To speed up relay turn-on
 - d. To suppress the inductive spike when the coil is de-energized
 4. What is the name of the motor reversing circuit using four MOSFETs?
 - a. Balanced bridge
 - b. Diamond bridge
 - c. H bridge
 - d. Wheatstone bridge
 5. In the motor reversing circuit using four MOSFETs, how many MOSFET are conducting at any given time?
 - a. 1
 - b. 2
 - c. 3
 - d. 4
 6. In a CMOS inverter circuit with a +3.3 volt power supply, what input voltage does it take to make the P-channel device to conduct?
 - a. -3.3 volts
 - b. 0 volts
 - c. +1.6 volts
 - d. +3.3 volts

7. Is there ever a time when both N and P-channel devices conduct at the same time in a CMOS inverter?
 - a. No
 - b. Yes
8. In a BiCMOS inverter, which type of transistor is used at the output?
 - a. CMOS
 - b. BJT
9. What is the reason that BJTs are combined with CMOS in a BiCMOS circuit?
 - a. Output can drive larger current loads
 - b. They are faster
 - c. They take up less space on the chip
 - d. They use less power
10. In a transmission gate, the MOSFETs are connected how with respect to the load?
 - a. In parallel
 - b. In series
11. A transmission gate can switch digital as well as analog signals.
 - a. True
 - b. False
12. A transmission gate is NOT bidirectional.
 - a. True
 - b. False
13. In an S/H circuit, what component is used to store the input voltage value?
 - a. Transmission gate
 - b. Resistor
 - c. Op amp
 - d. Capacitor
14. In an S/H circuit, the input voltage is stored when the transmission gate is
 - a. Open
 - b. Closed
15. In a multiplexer circuit using 8 transmission gates, how many gates are closed at the same time?
 - a. 1
 - b. 2
 - c. 4
 - d. 7