

- 001.** The order of doping regions in npn transistor **C**
 A $E > B > C$ B $C > B > E$
 C $E > C > B$ D $C > E > B$
- 002.** In a transistor, the base current is about .. of emitter current **D**
 A 25% B 20%
 C 35 % D 5%
- 003.** At the base-emitter junctions of a transistor, one finds **C**
 A a reverse bias B a wide depletion layer
 C low resistance D none of the above
- 004.** $I_C = \alpha I_E +$. **C**
 A I_B B I_{CEO}
 C I_{CBO} D βI_B
- 005.** In NPN BJT transistor which of the following terminal defines P-type? **D**
 A Emitter B Collector
 C Drain D Base
- 006.** BJT is a _____ device **B**
 A Voltage controlled B Current controlled
 C Frequency controlled D Power controlled
- 007.** Which of the following are the charge carriers available in BJT? **D**
 A Electrons B Neutrons
 C Holes D Both electrons and holes
- 008.** Which of the following BJT terminal controls the current flow? **A**
 A Base B Emitter
 C Collector D Gate
- 009.** For silicon transistor what is the base-emitter voltage? **B**
 A 0.3 V B 0.7 V
 C 0 V D 1 V
- 010.** The collector supply voltage for a CE configured transistor is 10V. The resistance $R_L = 800\Omega$. The A voltage drop across R_L is 0.8V. Find the value of collector emitter voltage. **A**
 A 9.2V B 3.7V
 C 6.5V D 9.8V
- 011.** The range of β is _____ **D**
 A 50 to 300 B 30 to 400
 C 10 to 20 D 20 to 500
- 012.** As the temperature of a transistor goes up, the base-emitter resistance **A**
 A decreases B increases
 C remains the same D none of the above
- 013.** If a BJT is to be used as an amplifier, then it must operate in _____ **B**
 A Cut-off mode B Active mode
 C Saturation mode D All of the mentioned
- 014.** On which of the following does the scale current not depends upon? **D**
 A Effective width of the base B Charge of an electron
 C Electron diffusivity D Volume of the base-emitter junction
- 015.** The input impedance of a transistor connected in .. arrangement is the highest **B**
 A common emitter B common collector
 C common base D none of the above

- 016.** The phase difference between the input and output voltages in a common base arrangement is . **D**
 A 180° B 90°
 C 270° D 0°
- 017.** Which of the following condition is true for cut-off mode? **A**
 A The output current is zero B The output current is proportional to the input current
 C The input current is zero D The output current is inversely proportional to the input current
- 018.** Which of the following is true for the active region of an npn transistor? **B**
 A The potential difference between the emitter and the collector is greater than 0.4 V B The collector current is directly proportional to the base current
 C The collector current is inversely proportional to the base current D The output current is zero
- 019.** The potential difference between the base and the collector V_{cb} in a pnp transistor in saturation region is _____ **C**
 A -0.2 V B 0.2 V
 C -0.5 V D 0.5 V
- 020.** Identify the true statement to operate pnp transistor in active region? **A**
 A CB junction is reversed bias and the EB junction is forward bias B CB junction is forward bias and the EB junction is forward bias
 C CB junction is forward bias and the EB junction is reverse bias D CB junction is reversed bias and the EB junction is reverse bias
- 021.** A transistor is connected in CB mode. If it is not connected in CE mode with same bias voltages, the values of I_E , I_B and I_C will .. **B**
 A increase B remain the same
 C decrease D doubles
- 022.** The curve between the collector current versus the potential difference between the base and emitter is **C**
 A A straight line inclined to the axes B A straight line parallel to the x-axis
 C An exponentially varying curve D A parabolic curve
- 023.** The ideal voltage gain of a transistor connected in common collector arrangement is .. **A**
 A equal to 1 B more than 10
 C more than 100 D less than 1
- 024.** $I_{CEO} = () I_{CBO}$ **C**
 A β B $1 + \alpha$
 C $1 + \beta$ D α
- 025.** A germanium transistor with $\alpha=0.98$ gives a reverse saturation current $I_{CBO}=10^{-10}$ A in a CB configuration. When it is used in CE configuration with a base current of 0.22 mA, calculate the collector current. **C**
 A 0.9867mA B 0.7654mA
 C 0.51078mA D 0.23456mA
- 026.** In I_{CEO} , wt does the subscript CEO mean? **C**
 A collector to base emitter open B emitter to base collector open
 C collector to emitter base open D emitter to collector base open
- 027.** The magnitude of the thermal voltage is given by **B**
 A k/Tq B kT/q
 C q/Kt D Tk/q

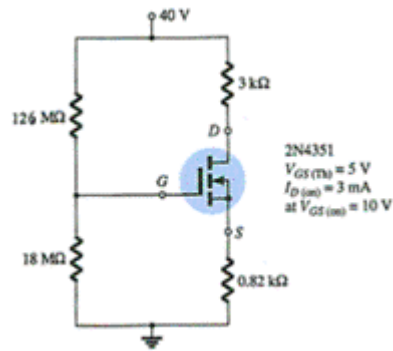
- 028.** The correct expression relating the emitter current I_e to the collector current I_c is **B**
- A $I_e = \alpha I_c$ B $I_c = \alpha I_e$
 C $I_e = I_c$ D $I_c = I_e$
- 029.** The emitter current I_E in a transistor is 3mA. If the leakage current I_{CBO} is $5 \mu A$ and $\alpha = 0.98$, calculate the collector and base current. **C**
- A 3.64mA and $55 \mu A$ B 3.64mA and $33 \mu A$
 C 2.945mA and $55 \mu A$ D 5.89mA and $33 \mu A$
- 030.** The relation between α and β is _____ **A**
- A $\alpha = \beta / (1 + \beta)$ B $\beta = \alpha / (1 - \alpha)$
 C $\beta = \alpha / (1 + \alpha)$ D $\alpha = \beta / (1 - \beta)$
- 031.** The AC current gain in a common base configuration is _____ **D**
- A $-\Delta I_C / \Delta I_E$ B $\Delta I_E / \Delta I_C$
 C $-\Delta I_E / \Delta I_C$ D $\Delta I_C / \Delta I_E$
- 032.** A transistor has an I_C of 100mA and I_B of 0.5mA. What is the value of α_{dc} ? **B**
- A 0.787 B 0.995
 C 0.543 D 0.659
- 033.** In a transistor, collector current is controlled by .. **B**
- A collector voltage B base current
 C collector resistance D all of the above
- 034.** The element that has the biggest size in a transistor is .. **A**
- A collector B base
 C emitter D collector-base-junction
- 035.** In a transistor .. **D**
- A $I_C = I_E + I_B$ B $I_B = I_C + I_E$
 C $I_E = I_C - I_B$ D $I_E = I_C + I_B$
- 036.** The most commonly used transistor arrangement is arrangement **A**
- A common emitter B common base
 C common collector D none of the above
- 037.** In a transistor, signal is transferred from a circuit **B**
- A high resistance to low resistance B low resistance to high resistance
 C high resistance to high resistance D low resistance to low resistance
- 038.** A collector characteristic curve is a graph showing .. **B**
- A emitter current (I_E) versus collector-emitter voltage (V_{CE}) with (V_{BB}) base bias voltage held constant B collector current (I_C) versus collector-emitter voltage (V_{CE}) with (V_{BB}) base bias voltage held constant
 C collector current (I_C) versus collector-emitter voltage (V_C) with (V_{BB}) base bias voltage held constant D collector current (I_C) versus collector-emitter voltage (V_{CC}) with (V_{BB}) base bias voltage held constant
- 039.** The Early Effect is also called as **A**
- A Base-width modulation effect B Base-width amplification effect
 C Base-width un amplification effect D Base-width demodulation effect
- 040.** Collector current (I_c) reaches zero when **D**
- A $V_t = V_{ce} \ln (I_{sc}/I)$ B $V_{ce} = V_t \ln (I/I_{sc})$
 C $V_{ce} = V_t \ln (I_{sc} + I/I)$ D $V_{ce} = V_t \ln (I_{sc}/I)$
- 041.** The process of linearly increasing the amplitude of electrical signal is called **B**
- A Attenuation B Amplification
 C Modulation D Conversion

- 042.** The early effect in bipolar junction transistor is caused by **C**
 A Fast turn ON B Fast turn OFF
 C Large base - collector reverse bias D Large base - emitter forward bias
- 043.** In which of the following modes can a BJT be used? **D**
 A Cut-off mode B Active mode
 C Saturation mode D All of the mentioned
- 044.** When BJT is operated in active region and EB junction potential is increasing, the width of corresponding depletion region ----- **B**
 A Increases B Decreases
 C Remains same D disappears
- 045.** If a 2 mV signal produces a 2 V output, estimate the voltage gain. **D**
 A 0.001 B 0.004
 C 100 D 1000
- 046.** V_{CE} approximately equals _____ when a transistor switch is cut off. **A**
 A V_{cc} B 0.2V
 C 0.3V D 0V
- 047.** When transistors are used in digital circuits they usually operate in the . **C**
 A active region B breakdown region
 C saturation and cutoff regions D linear region
- 048.** A transistor may be used as a switching device or as a . **D**
 A fixed resistor B tuning device
 C rectifier D variable resistor
- 049.** An N-channel MOSFET, the source and drain region has to be doped with **A**
 A n-type material B p-type material
 C source with p-type and drain with n-type material D source with n-type and drain with p-type material
- 050.** A D-MOSFET typically operate in **C**
 A The depletion mode only. B The enhancement mode only.
 C The both depletion & enhancement mode. D The small impedance mode.
- 051.** Inversion layer in an MOS circuit is formed by **D**
 A doping B impact ionization
 C tunneling D electric field
- 052.** The function of the SiO_2 layer in MOSFET is to provide **A**
 A isolation B coupling
 C conduction D amplification
- 053.** The Transistor is connected in Common collector configuration has **A**
 A high input & low output resistance B low input & high output resistance
 C low input & low output resistance D high input & high output resistance
- 054.** BJT is a _____ device **A**
 A Bipolar B Unipolar
 C tripolar D thyristor
- 055.** In a good bipolar transistor operating in the active region, what is the spatial profile of minority carriers in the base? **D**
 A Exponentially increasing from emitter to collector. B Exponentially decreasing from emitter to collector
 C Linearly increasing from emitter to collector. D Linearly decreasing from emitter to collector.
- 056.** With the E-MOSFET, when gate input voltage is zero, drain current is? **B**

- A at saturation
C widening the channel
- B zero
D I_{DSS}
- 057.** Which of the following current equations is true? **C**
A $I_G = I_D$
B $I_G = I_S$
C $I_D = I_S$
D $I_G = I_D = I_S$
- 058.** For the FET, the relationship between the input and output quantities is _____ due to the _____ term in Shockleys equation. **C**
A nonlinear, cubed
B linear, proportional
C nonlinear, squared
D linear, squared
- 059.** A very simple bias for a D-MOSFET is called? **C**
A self biasing
B gate biasing
C zero biasing
D voltage-divider biasing
- 060.** Consider the following statements for a metal oxide semiconductor field effect transistor (MOSFET): P: As channel length reduces, OFF-state current increases. Q: As channel length reduces, output resistance increases. R: As channel length reduces, threshold voltage remains constant. S: As channel length reduces, ON current increases. Which of the above statements are INCORRECT? **C**
A P and Q
B P and S
C Q and R
D R and S
- 061.** Which one of the following is not a voltage controlled circuit? **C**
A MOSFET
B IGBT
C BJT
D JFET
- 062.** Maximum no electrons in the base region of an NPN transistor will not recombine for reason being **A**
A Have a long lifetime
B Have a negative charge
C Must flow a long way through thebase
D Flow out of the base
- 063.** When plotting the transfer characteristics, choosing $V_{GS} = 0.5V_P$ will result in a drain current level of _____ I_{DSS} . **B**
A 0
B 0.25
C 0.5
D 1
- 064.** The slope of the dc load line in a self-bias configuration is controlled by _____. **D**
A V_{DD}
B R_D
C R_G
D R_S
- 065.** For _____, Shockleys equation is applied to relate the input and the output quantities. **D**
A JFETs
B depletion-type MOSFETs
C enhancement-type MOSFETs
D JFETs and depletion-type MOSFETs
- 066.** Which of the following is (are) true of a self-bias configuration compared to a fixed-bias configuration? **D**
A One of the dc supplies is eliminated.
B A resistor R_S is added.
C V_{GS} is a function of the output current I_D .
D All of the above
- 067.** Which of the following describe(s) the difference(s) between JFETs and depletion-type MOSFETs? **D**
A V_{GS} can be positive or negative for the depletion-type.
B I_D can exceed I_{DSS} for the depletion-type.
C The depletion-type can operate in the enhancement mode.
D All of the above

068.

A

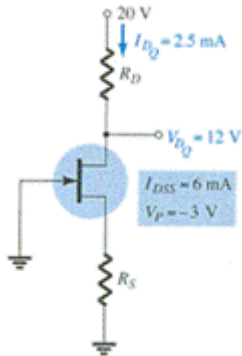


Calculate the value of V_{DSQ} .

- A 40V
B 30V
C 20V
D 0V

069. Given the values of V_{DQ} and I_{DQ} for this circuit, determine the required values of R_D and R_S .

C



- A 2 kΩ, 2 kΩ
B 1 kΩ, 5.3 kΩ
C 3.2 kΩ, 400 Ω
D 2.5 kΩ, 5.3 kΩ

070. The operation of a JFET involves

D

- A A flow of minority carriers
B Negative resistance
C Recombination
D A flow of majority carriers

071. JFET has..... degree of isolation between input and output

B

- A Low
B High
C Moderate
D zero

072. A JFET is a driven device

C

- A current
B voltage
C both current and voltage
D none of the above

073. In an enhancement-type MOSFET, the drain current is zero for levels of V_{GS} less than the _____ level.

A

- A $V_{GS(Th)}$
B $V_{GS(off)}$
C V_P
D V_{DD}

074. To bias a e-MOSFET _____

A

- A we can use either gate bias or a voltage divider bias circuit
B we can use either gate bias or a self bias circuit
C we can use either self bias or a voltage divider bias circuit
D we can use any type of bias circuit

075. When drain voltage equals the pinch-off-voltage, then drain current . with the increase in drain voltage

C





- A decreases
B increases
C remains constant
D none of the above

076. The input gate current of a FET is

D

- A A few micro-amperes
B A few mili-amperes
C A few amperes
D Negligible

- 077.** A JFET can operate in **A**
- A Only depletion mode B Only enhancement mode
C Both depletion and enhancement modes D Neither depletion nor enhancement modes
- 078.** When a JFET is pinched off, the depletion layers are **B**
- A Conducting B Close together
C Touching D Far apart
- 079.** For a p channel MOSFET which of the following is not true? **B**
- A The source and drain are a p type semiconductor B The induced channel is p type region which is induced by applying a positive potential to the gate
C The substrate is a n type semiconductor D Substrate is shorted to source terminal
- 080.** In applications where input resistance is needed, the JFET is preferred to the bipolar transistor **D**
- A Low B Very low
C Zero D High
- 081.** For NMOS transistor which of the following is not true? **C**
- A The substrate is of p-type semiconductor B Inversion layer or induced channel is of n type
C Threshold voltage is negative D None of the mentioned
- 082.** The process trans conductance parameter is directly proportional to **D**
- A Electron mobility only B Electron mobility)⁻¹ only
C Oxide capacitance only D Product of oxide capacitance and electron mobility
- 083.** The name field effect is related to the layers of a JFET **A**
- A Depletion B Gate
C Source D Drain
- 084.** As compared to a bipolar transistor, a JFET is **C**
- A Equally sensitive to changes in input voltage B More sensitive changes in input voltage
C Less sensitive changes in input voltage D Highly sensitive to changes in input voltage
- 085.** The JFETs are normally used as current sources in ----- region **B**
- A Cut-off B Saturation
C Ohmic D linear
- 086.** Whenever a JFET operates above pinch-off voltage **D**
- A Drain current starts decreasing B Drain current increases steeply
C Depletion regions become smaller D Drain current remains nearly constant
- 087.** The drain current of the N-channel JFET increases with **A**
- A .Increasing positive voltage at the gate B Constant voltage at the gate
C Decreasing positive voltage at the gate D None of the above
- 088.** The JFET is a **A**
- A Unipolar device B Tripolar device
C Bipolar device D None of the above
- 089.** The input impedance of an ideal JFET **C**
- A Is impossible to predict B Approaches unity
C Approaches infinity D Approaches zero
- 090.** The MOSFET is almost ideal as switching device because **C**
- A It has longer life B It works progressively

- C It consumes low power D It has linear characteristics
- 091.** The MOSFET also called as ----- **D**
- A EMOSFET B JFET
- C DMOSFET D IGFET
- 092.** In MOSFETs N-channel is more preferred than P-channel because **B**
- A It is cheaper B It is faster
- C It has better drive capability D It has better noise immunity
- 093.** The JFET is also known as square law device because its **A**
- A Drain current varies as square of the gate source voltage B Trans conductance curve is parabolic
- C Reverse gate leakage current varies as square of reverse gate voltage D Drain current varies as square of its drain voltage for a fixed V_{gs}
- 094.** The enhancement N-channel MOSFET **D**
- A Can be operated as an enhancement MOSFET by applying -ve bias to gate Can be operated as a JFET with zero gate voltage
- C Can be operated as an enhancement MOSFET by applying +ve bias to gate D Cannot be operated as an enhancement MOSFET
- 095.** The MOSFET stands for **C**
- A Metal oxidized selenium FET B Metal oxide surface FET
- C Metal oxide semiconductor FET D Metal of surface FET
- 096.** The enhancement MOSFET is **A**
- A Normally off device B Useful as a very good constant voltage source
- C Widely used because of easy in its fabrication D Normally on device
- 097.** What is the typical range of turn-off times for SCRs? **A**
- A 5 μ s to 30 s B 1 μ s to 5 s
- C 0.1 μ s to 1 s D D. 0.01 μ s to 0.1 s
- 098.** What is the maximum current (rms) rating for commercially available LASCRs today? **C**
- A 13 A B 15 A
- C 3 A D 25 A
- 099.** Which of the following transistors is an SCR composed of? **A**
- A npn, pnp B npn, npn
- C pnp, pnp D none of these
- 100.** How many layers of semiconductor materials does a silicon-controlled rectifier (SCR) have? **C**
- A 2 B 3
- C 4 D 5
- 101.** Which of the following devices has (have) four layers of semiconductor materials? **D**
- A Silicon-controlled switch (SCS) B Gate turn-off switch (GTO)
- C Light-activated silicon-controlled rectifier (LASCR) D D. All of the above
- 102.** What is the frequency range of application of SCRs? **B**
- A About 10 kHz B About 50 kHz
- C About 250 kHz D About 1 mHz
- 103.** Which one of the SCR terminals fires the SCR? **C**
- A Anode B Cathode
- C Gate D All of the above
- 104.** An SCR is turned off by . **A**

- A Reducing anode voltage to zero B Reducing gate voltage to zero
C Reverse biasing the gate D None of the above
- 105.** In an SCR circuit the supply voltage is generally .. that of break over voltage **B**
A Equal to B Less than
C Greater than D double
- 106.** An SCR combines the features of .. **B**
A A rectifier and resistance B A rectifier and transistor
C A rectifier and capacitor D None of the above
- 107.** _____ are areas of application for SCRs. **D**
A Relay controls B Time-delay circuits
C Motor controls D All of the above
- 108.** To turning OFF an SCR, it is essential to decrease current to be less than **A**
A trigger current B holding current
C break over current D none of these
- 109.** An SCR behaves as a . switch **A**
A Unidirectional B Bidirectional
C Mechanical D magnetic
- 110.** An SCR is sometimes called **D**
A Triac B Diac
C Unijunctiontransistor D Thyristor
- 111.** The major drawback of the first generation IGBTs was that, they had **D**
A latch-up problems B noise & secondary breakdown problems
C sluggish operation D latch-up & secondary breakdown problems
- 112.** Which of the following devices has a negative-resistance region in its characteristics curve? **C**
A SCR B SCS
C UJT D Phototransistor
- 113.** From the two transistor (T1 & T2) analogy of SCR, the total anode current of SCR is **B**
_____ in the equivalent circuit.
A the sum of both the base currents B the sum of both the collector current
C the sum of base current of T1 & collector current of T2 D the sum of base current of T2 & collector current of T1
- 114.** If gate current is increased, then anode-cathode voltage at which SCR closes . **A**
A Isdecreased B Isincreased
C Remains the same D None of the above
- 115.** When SCR is OFF, the current in the circuit is . **B**
A Exactly zero B Small leakage current
C Large leakage current D None of the above
- 116.** When SCR starts conducting, then . loses all control **A**
A Gate B Cathode
C Anode D None of the above
- 117.** The two transistor model of the SCR can be obtained by **D**
A bisecting the SCR vertically B bisecting the SCR horizontally
C bisecting the SCRs top two & bottom two layers D bisecting the SCRs middle two layers
- 118.** The controlling parameter in IGBT is the **B**
A I_G B V_{GE}
C I_C D V_{CE}

119. In IGBT, the nlayer above the p^+ layer is called as the A
- A drift layer B injection layer
 C body layer D collector Layer
120. In IGBT, the p^+ layer connected to the collector terminal is called as the B
- A drift layer B injection layer
 C body layer D collector Layer
121. What is the range of the variable resistor in the equivalent circuit of a unijunction transistor? A
- A $50\ \Omega$ to $5\ k\Omega$ B $6\ k\Omega$ to $10\ k\Omega$
 C $5\ \Omega$ to $50\ \Omega$ D $1\ \Omega$ to $5\ \Omega$
122. IGBT possess B
- A low input impedance B high input impedance
 C high on-state resistance D second breakdown problems
123. IGBT & BJT both posses A
- A low on-state power losses B high on-state power losses
 C low switching losses D high input impedance
124. The three terminals of the IGBT are C
- A base, emitter & collector B gate, source & drain
 C gate, emitter & collector D base, source & drain
125. In a photo transistor the photocurrent is flowing through B
- A emitter base junction B collector base junction
 C collector emitter junction D all the mentioned
126. Phototransistor is a form of _____ transistor which is sensitive to light. B
- A Unipolar B Bipolar
 C Tripolar D Non of these
127. What is the reason phototransistor produces more current than a photodiode? C
- A A wider spectrum is accepted by the phototransistor than the photodiode B The current produced by photons is amplified by the h_{fe} of the transistor
 C The phototransistor can heavily doped than the photodiode D At low light conditions, a photodiode is used.
128. The voltage blocking capability of the IGBT is determined by the D
- A injection layer B body layer
 C metal used for the contacts D drift layer
129. The structure of the IGBT is a C
- A P-N-P structure connected by a MOS gate B N-N-P-P structure connected by a MOS gate
 C P-N-P-N structure connected by a MOS gate D N-P-N-P structure connected by a MOS gate
130. The _____ is photosensitive to act as light gathering element. A
- A Base-emitter junction B Base-collector junction
 C Collector-emitter junction D Base-collector junction and Base-emitter junction
131. Phototransistors based on hetero-junction using _____ material are known as waveguide phototransistors. C
- A InGaP B InGaAs
 C InGaAsP/ InAlAs D ErGaAs
132. In opto isolators, which of the following device receives the light? B
- A LED B Light sensitive detector

- C Both D none
133. The optoisolators are categorized into _____ types C
 A 1 B 2
 C 4 D 6
134. The optoisolator consists of _____ devices C
 A LED B Light sensitive detector
 C Both D none
135. Which turn on method is preferred for triggering the LASCR? C
 A Forward voltage B dv/dt
 C light D temperature
136. When the light touches the phototransistor the current ____ into the base region C
 A Remains doubles B Constant
 C Flow D Not flow
137. Phototransistors are operated in _____ regions. C
 A Passive B Hybrid
 C Active D saturation
138. Electron-hole pair occurs in _____ biased CB junction. A
 A Forward B Reverse
 C Hybrid D none
139. Which is a type of Opto-isolator? B
 A CMCP793V-500 B MOC3021
 C MPU 6050 D L298N
140. The use of optical isolation in the input module side of a controller device is to A
 A Reduce the effect of electrical noise and prevents the damage to the processor B Prevent the damage process
 C Provide common ground D Reduces the effect of electrical noise
141. The commercially available circulators exhibit insertion losses around _____ D
 A 2 dB B 0.7 dB
 C 0.2 dB D 1 dB
142. It is a passive device which allows the flow of optical signal power in only one direction and preventing reflections in the backward direction. C
 A Fiber slice B Optical fiber connector
 C Optical isolator D Optical couple
143. Which feature of an optical isolator makes it attractive to use with optical amplifier? B
 A Low loss B Wavelength blocking
 C Low refractive index D Attenuation
144. How many implementation methods are available for optical isolators? D
 A One B Four
 C Two D Three
145. A device which is made of isolators and follows a closed loop path is called as a _____ A
 A Circulator B Gyrator
 C Attenuator D Connector