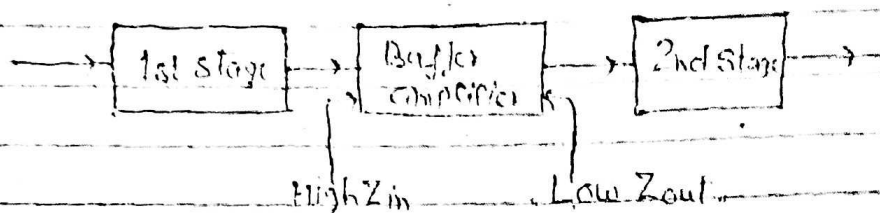


(4)

2. As Buffer amplifier:- Buffer amplifier is a stage of amplification that isolates the preceding stage from the following stage. A JET can act as a buffer amplifier due to high input impedance and low output impedance.



3. Phase-shift Oscillator:- Due to high input impedance JET are widely used in phase-shift oscillators. JET is specially valuable in phase-shift oscillators to minimize the loading effect.

← Metal oxide Semiconductor FET →

← MOSFET →

All the relations, applications and parameters of FET MOSFET are so similar to FET. Because metal oxide semiconductor junction field effect transistor is also a type of field effect transistors.

Metal oxide semiconductor field effect transistor is an important semiconductor device which is widely used in many circuit applications. The input impedance of MOSFET is much more than that of a FET because of very small gate leakage current.

* The MOSFET can be used in many of the circuits covered for the FET.

① Structure and working symbol of MOSFET is given below. Like FET, MOSFET has also three terminals viz. Gate, Source and Drain. Gate of MOSFET deposited over the oxide layer. Silicon dioxide is an insulator; therefore gate is insulated from the channel. Due to this reason MOSFET is called, same times insulated gate FET.

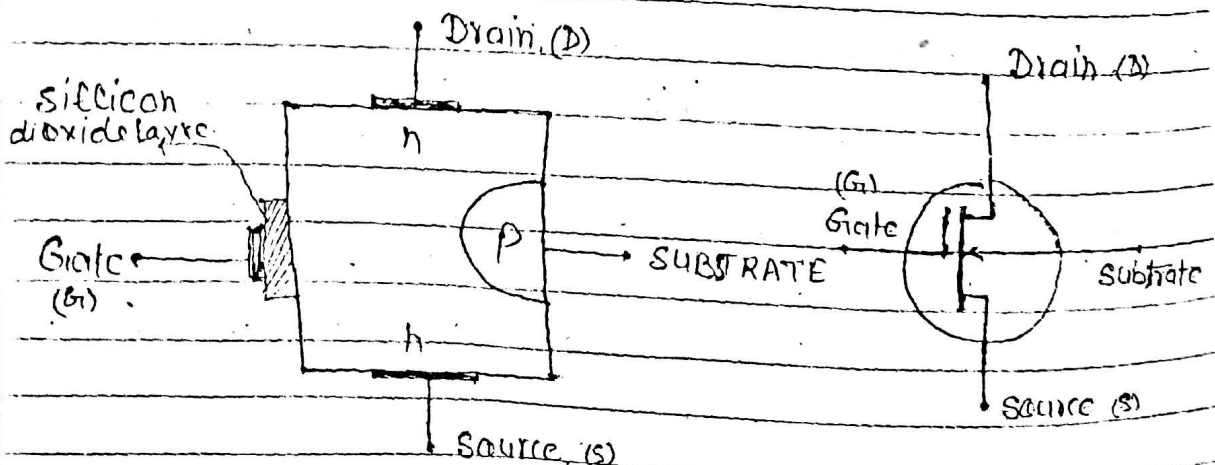
②: There is a single P-region. This region is called substrate.

③: The three terminals of MOSFET are given as below-

① - Source (S)

② - Gate (G)

③ - Drain (D)

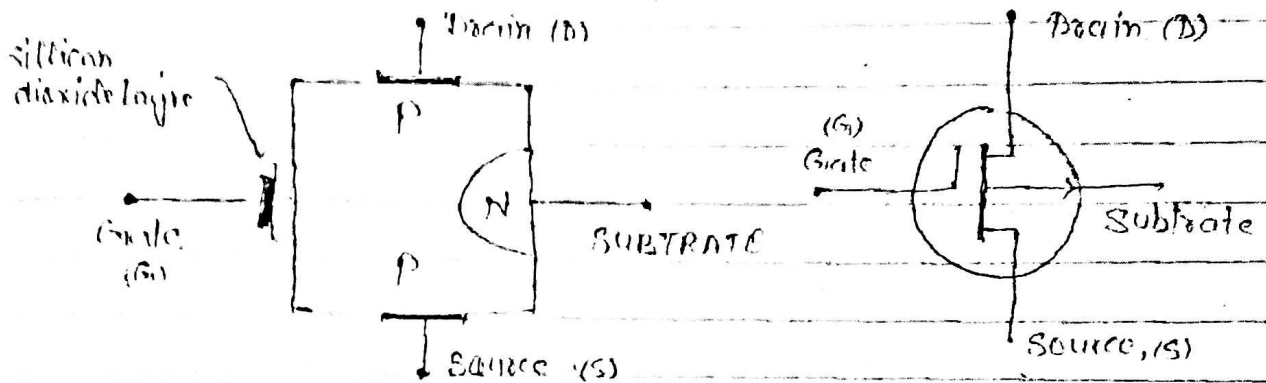


n-channel MOSFET

→ Like IJT, MOSFET are also two types -

- (1) N-channel MOSFET,
- (2) P-channel MOSFET,

Schematic symbol of P-channel MOSFET is given below

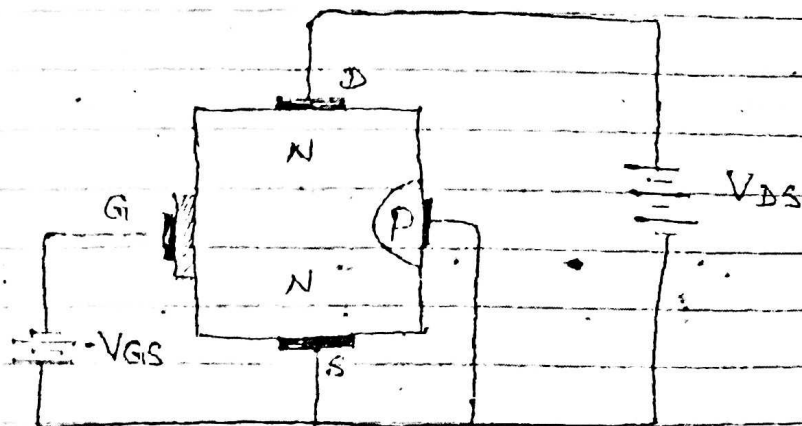


P channel MOSFET

Working of MOSFET:- All the connections are same as like JFET. Gate is reverse biased.

Working circuit of MOSFET is given below -

In IJT, Gate is formed as diode
But in MOSFET Gate is formed as a small capacitor.



Working circuit for MOSFET

One plate of this capacitor is Gate and other is the channel.

SiO₂ layer plays roll of dielectrics. When negative voltage is applied to the gate, electrons accumulate on it. These electrons repel the conduction band electrons in the n channel. Then small current conduction through the channel. The greater negative voltage on the gate, the less current conduction from source to drain.

If gate is positive then more electrons are made available in the n-channel. In this case current from source to drain increased.

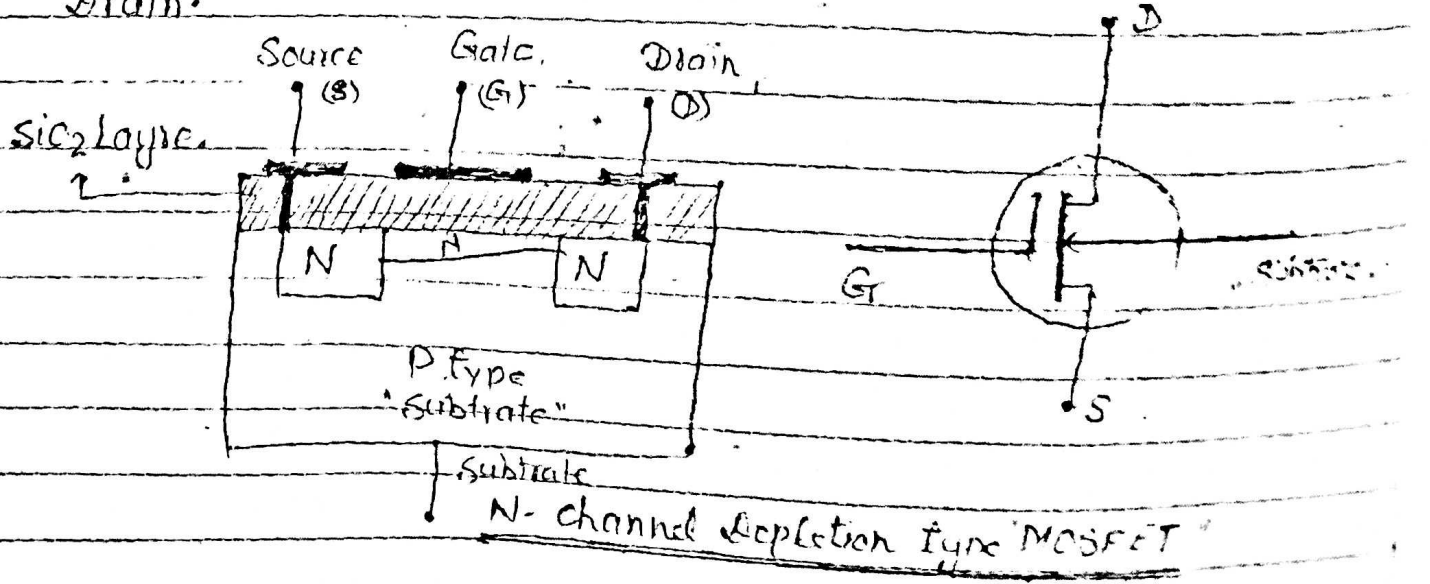
MOSFET has no diode so it can operate in positive or negative gate voltage.

Types of MOSFET: There are two types of MOSFET which are given below-

- ① The Depletion MOSFET
- ② The Enhancement MOSFET

① Depletion MOSFET is ^{and structure} Construction of Depletion type MOSFET is shown in the figure.

In N-channel MOSFET, two highly doped N-type sea regions are diffused in a lightly doped P-type substrate. A channel is diffused between source and drain.

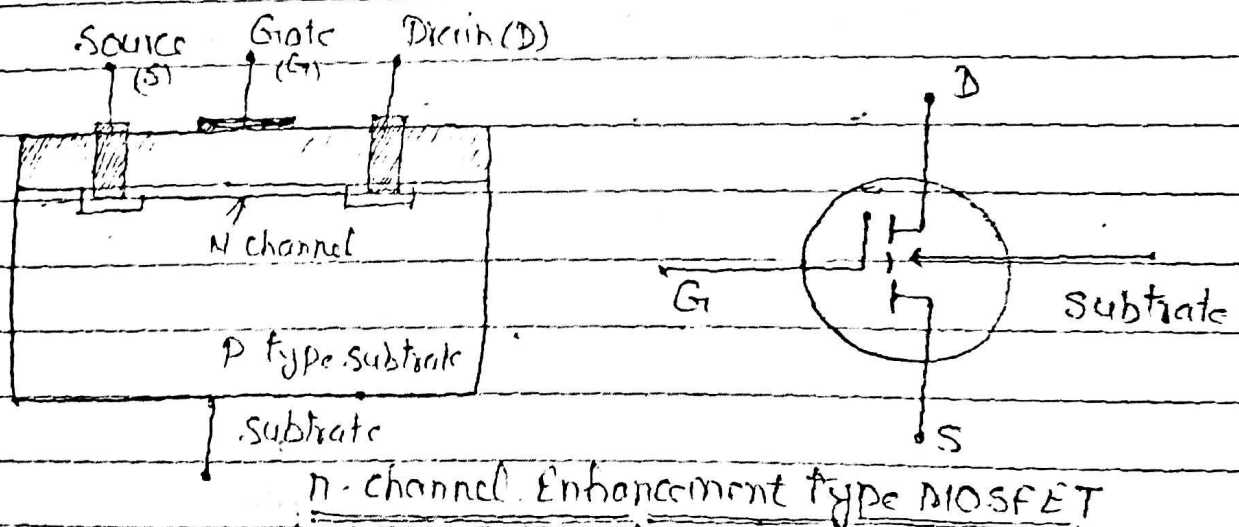


In depletion type MOSFET, a conducting channel exists between drain and source with zero Gate bias. In depletion type MOSFET drain current I_D flows when $V_{GS} = 0$. It is generally called "ON-MOSFET" because it conducts even with zero gate bias.

N-channel MOSFET may be operated in either the enhancement mode or the depletion mode.

2:- The Enhancement MOSFET :- Construction of Enhancement MOSFET is

shown in the figure. Two highly doped N-type regions are diffused in lightly doped P-type substrate.



Enhancement MOSFET conducts only when Gate is positive with respect to source. It can never operate with a negative gate voltage. The MOSFET is "cut off" when gate to source voltage is zero. So it is called "OFF MOSFET".