**Schottky Barrier Diode (SBD)**

Unlike normal diodes SBD are formed by contacting a noble metal with a N-type semiconductor using the metal-semiconductor contact principle. Typically, one of Gold, Silver and Platinum is used as positive electrode and Si or GaAs is used as negative electrode.

**Internal Structure and Character**

* N-type semiconductor have high number of electrons compared to noble metal which have low fermi energy level compared to semiconductor. This leads to diffusion of electron from N-type semiconductor to metal. With the diffusion of electrons there is an electrostatic field developed in junction between metal and semiconductor. Field leads to electron drift motion from semiconductor to metal. At some point electron drift motion and electron diffusion motion come to equilibrium. The barrier voltage created at this point is called Schottky barrier.
* Because metal is an absolute conductor, unlike other PN junctions the negative charge distributed within only a thin layer of atomic size which make the depletion layer is only on N-type semiconductor side.

**Practices Used in Manufacturing**

1. Since the electron mobility is larger in-order to obtain good frequency characteristics a N-type semiconductor chooses as substrate.
2. In-order to reduce the capacitance of the SBD and increase reverse breakdown voltage with out making large series resistance, a high resistance N-thin layer added on the N+ Substrate.

**Special Features**

1. Forward conduction threshold voltage and Forward conduction voltage drop are low compared with other diodes.
2. Since the reverse recovery charge of Schottky diode is very small, switching speed is very fast and switching loss is very small. (Make it suitable for high frequency application)

**Drawback**

Low reverse breakdown voltage and high reverse leakage current.

* Since the SBD has very short recovery time and low forward drop voltage with low heat generation capabilities it is more suitable to use in power regulation circuit to prevent power switching issue.