Themal stability:-

The minimum average power in which transistor can dissipate depends upon the transistor construction.

The leakge current is extremely temperature dependent and increases with the rise in temperature of collector - base junction. with the increase in collector current, collector power dissipation increases. which raises the junction temperature. that leads further increase in current collector current. This process is may lead to destruction of transistor. This is called thermal instability.

opposite to Thermal instability is called thermal stability. It is achieved by the heat sink.