Moore’s Law

Moore's law is the observation that the number of transistors in a dense integrated circuit would double about every two years.

An exponential increase in density would lead to an exponential in increase of the speed of the processors.

Physical Limitations

1. Power Problem – More transistors lead to more power consumption and we cannot have infinite power.
2. Temperature Problem – More power leads to more heat and the fans cannot dissipate all the heat generated. If the temperature is not controlled the chips may melt.
3. Power is directly proprtional to square of Voltage and voltage cannot be reduced consistently. It should be more than threshold voltage of transistors.
4. Voltage should also keep some margin for noise voltage so that the current state of the transistor be determined deterministically..
5. Leakage Power – leakage power has been growing and cannot really be controlled.