

**Moore's law** is the observation that the number of transistors in a dense integrated circuit (IC) doubles about every two years. Moore's law is an observation and projection of a historical trend.

Dynamic power =  $\alpha$  \* capacitance \* clock frequency \* square of voltage swing

It has now stopped being true because of the following reasons: -

1. Transistors consume power when they switch. Increasing transistor density leads to increased power consumption. High power leads to high temperature.
2. Increasing the clock frequency means we consume more power. High power leads to high temperature.
3. There is a threshold for transistor voltage below which they cannot operate.
4. Noise from nearby signals can corrupt the voltage, if the voltage is too low.
5. Physical limit on size of transistors.
6. Dennard Scaling - Voltage does not scale with transistor size anymore.
7. Leakage power growing over time