

Moore's law is the idea that the number of transistors on a microchip doubles every two years.

Moore's law is starting to fade away because of heat removal, power increases, power consumption, noise in voltage scaling, and electrical leakage.

Heat removal and temperature are limiting issues because we are approaching the point where the microchips will melt under normal conditions.

Dennard scaling is the idea that as transistors get smaller, they will consume the same amount of power; as we add more transistors, we are keeping the same amount of power for more performance, which leads to heat and temperature issues.

Due to the smaller pathways, voltage scaling cannot prevent electrical leakage and power loss; voltage scaling is more limited due to the less variance in voltage changes which limits scaling due to noise, while at the same time the small variance in voltage scaling makes detecting the voltage threshold more difficult. Voltage scaling is also responsible for limiting the dynamic power consumption, which affects the power and battery life of mobile devices.