

ANALOG VS. DIGITAL CIRCUITS

Analog and digital circuits are used to transmit and process information like sound and light from an environment to generate continuous variable signals. Analog circuits can route the signals directly, whereas digital circuits change the analog signals by evaluating them at regular intervals and giving out the resulting values. To get the outputs, analog circuits can directly give the signals while a digital circuit has to change the information back to an analog signal. The working of an analog circuit can be done with a normal waveform for converting, storing and amplifying the signals, while a digital circuit alters the wave forms into pulse signals.

Analog Circuit

The analog electronic circuit includes an analog signal with any continuously changeable signal. While working on an analog signal, an analog circuit alters the signal in some manner. Analog circuits can be used to convert the original signal into some other format such as a digital signal. Analog circuits may also modify signals in inadvertent ways like adding noise or distortion. Analog circuits are classified into two types, namely active analog circuits and passive analog circuits. An analog circuit uses an electrical power source while a passive circuit uses no external electrical power.

Digital Circuit

A digital circuit is a circuit where the signal should be one of two discrete levels. Each level is interpreted as one of two different states (for instance, 0 or 1). These circuits built with transistors to make logic gates in order to execute Boolean logic operation. This logic is the base of digital electronics and computer processing. Digital circuits are less vulnerable to degradation in excellence than analog circuits. It is also simpler to execute error detection and rectification with digital signals. To make the routine process of designing these circuits, designers use EDA (electronic design automation) tools, a kind of software that develops the logic in a digital circuit.

The **main differences** between analog and digital circuits are:

- Analog circuits operate on analog signals commonly known as continuous valued signals whereas digital circuits function on signals that exist simply at 2 levels, i.e. zeros and ones.
- The designing of an analog circuit is difficult since every component has to be positioned by hand for designing the circuits whereas digital circuits are very simple to design since the technique of an automation can be used at a variety of levels of circuit design.
- In analog circuits, no change of i/p signals is necessary before processing, the circuit directly executes different logical operations and generates an analog o/p whereas in digital circuits, the i/p signals change from analog to digital (A/D) form before it is processed. That is to say, the digital circuit is accomplished by processing digital signals only, and generates o/p which is again changed back from digital to analog signals (D/A) so that the o/p gives relevant results that can be understood by individuals.
- Analog circuits are typically routine made and they don't have flexibility whereas digital circuits have a high degree of elasticity.