High side and Low side Switching

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Differences

1. **High side Switching:**

In high side switching, the switching device is placed between the positive supply and the load.

The load is connected to the drain or collector of the switching device, and the other end of the load is connected to ground.

When the switch is turned on, current flows from the positive supply, through the switching device, through the load, and to ground.

1. **Low side Switching:**

In low side switching, the switching device is placed between the load and ground (the low side of the circuit).

The load is connected directly to the positive supply voltage, and the other end of the load is connected to the drain or collector of the switching device.

When the switch is turned on, current flows from the positive supply, through the load, through the switching device, and to ground.

A diagram of a low-side switch

Description automatically generated

Why to choose one over the other

1. **High side Switching:**

Load Isolation: When the switch is off, the load is completely isolated from the power supply, which can be important for safety or power saving.

Better Grounding: The load is directly connected to ground, which can reduce noise and improve circuit stability.

Then we use it when we want the load to be completely isolated(disconnected) from power supply

1. **Low side Switching:**

Simple Drive Circuit: The control circuit is simpler because the switching device’s gate/base is referenced to ground. This often allows for direct driving of the gate/base with a low voltage control signal.

Lower Voltage Stress: The switch is subjected to lower voltage stress, as it primarily deals with the voltage difference between the load and ground.

We use it when the load is simple and small as a led or relay that can be connected to the power supply directly.