

## Schottky and Zener Diodes

The 1N5819 Schottky diode is highlighted for its low conduction losses, making it efficient in circuits. A comparison shows that while the 1N4007 diode has a forward voltage drop of about 0.87 volts (resulting in 0.87 watts power loss), the Schottky diode only drops around 0.45 volts (leading to 0.45 watts loss). Key advantages of Schottky diodes include their low forward voltage drop and minimal conduction losses, which enhance circuit efficiency. They also feature extremely fast switching speeds suitable for high-frequency operations, crucial for applications like boost converters. However, they have lower blocking voltages compared to common diodes and can exhibit higher reverse leakage currents.

Zener diodes, or 'Z' diodes, can be used similarly to common diodes but are typically connected in reverse bias with a resistor. Important specifications include zener voltage and power dissipation; these determine how they function as crude voltage regulators or references. For example, using a 5.1V zener diode with a resistor allows it to conduct above its zener voltage, stabilizing output at approximately its rated value. The maximum current through the zener can be calculated based on input voltage minus zener voltage divided by maximum current capacity; this ensures safe operation without exceeding limits. Zeners can also clip AC signals by connecting two in series, effectively limiting both positive and negative peaks.