



Low Voltage Detector

Description

This circuit utilizes a zener diode to set the comparator threshold voltage, which, with the appropriate resistor values of R_1 , R_2 , and R_3 , in turn sets the comparator trip voltage. Initially, consider the case when the power supply voltage, $V+$, is greater than the zener voltage. A current flows through R_1 and the zener diode. The zener voltage, as set by the zener diode and R_1 , decreases slowly with decreasing $V+$ voltage, and can be considered fixed relative to ground, to be used as an input reference to the minus input of the voltage comparator. As $V+$ decreases, the voltage set by resistor divider R_2 and R_3 decreases proportional to $R_3/(R_2+R_3)$, which tends to decrease faster than the zener diode voltage. At the designated comparator trip voltage, the $R_3/(R_2+R_3)$ resistor-divider voltage crosses the threshold to below the zener voltage causing the comparator output to toggle, as a low voltage condition is detected. Using CMOS voltage comparators, R_1 , R_2 , and R_3 can be high valued resistors; this circuit functions with minimal power dissipation as well as little zener diode and resistor heating effects.

For full schematic diagram and notes, please register and login at aldinc.com