designideas

Simple blown-fuse indicator sounds an alarm

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Safety fuses or fusible links see wide use in modern electronic equipment to protect the load and the power supply—especially batteries—against short circuits and excessive load current. Fuses are inexpensive and simple, and a wide range of parts is available. However, you must replace them when they blow, and, when they do, you need an indicating circuit that warns you about its failure, especially when the fuse body is ceramic or sand-filled for improved protection against arcing.

The circuit in **Figure 1** signals that a fuse has blown. Input voltage ranges from 4 to 30V dc. The input range of the 78L05 voltage regulator determines the high limit; the lower one is less than the input range of the voltage regulator, but 4V dc is sufficient for the indicator to operate.

When fuse F_1 is in good order, diode

 $\mathrm{D_1}$ is forward-biased, but its forward voltage is insufficient to bias forward-flashing diode $\mathrm{D_2}$ and the $\mathrm{Q_1}$'s base-emitter junction. The self-driven HCM1206X buzzer is off, and the flashing diode does not flash. So, the alarm

circuit is in standby mode. When F_1 blows, it no longer bridges the base-emitter-flashing-LED network. The 1-k Ω resistor forward biases D_2 and Q_1 's base-emitter junction, forcing the buzzer to sound at a low frequency equal to the flashing frequency of D_2 . During circuit operation, the 0.1- μ F capacitor eliminates the buzzer's "tin-kling" when the flashing LED is in the **off state.edn**

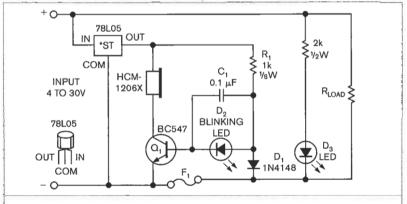


Figure 1 When fuse F_1 blows, the transistor biases on, sounding the buzzer and powering D_2 .