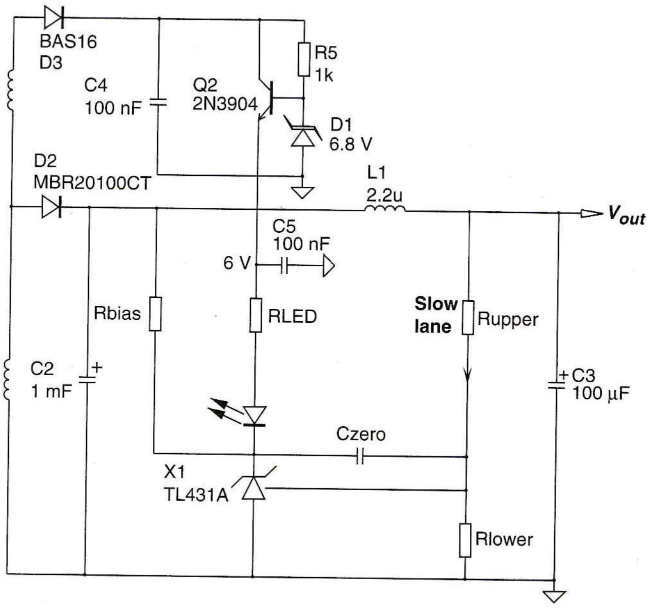

FIGURE 3-42 A bipolar can also do the job.

$$f_{p1} = \frac{1}{2\pi R_{pz} C_{pz}} \tag{3-68a}$$

$$f_{po} = \frac{1}{2\pi R_{upper} C_{zero1}} \tag{3-68b}$$

$$f_{z2} = \frac{1}{2\pi (R_{LED} + R_{pz}) C_{pz}} \tag{3-69}$$

$$f_{p2} = \frac{1}{2\pi R_{pullup} C_{pole2}} \tag{3-70}$$

$$G = \frac{R_{pullup}}{R_{LED}} \mathrm{CTR} \tag{3-71}$$

The first exercise consists of finding the value of R_{LED} to get the right gain (or attenuation) at the selected crossover frequency f_c. Equation (3-66) can be rewritten as follows, highlighting the positions of the poles and zeros:

$$G(s) \approx \mathrm{CTR} \frac{R_{pullup}}{R_{LED}} \frac{\left(1 + \frac{s}{s_{z1}}\right)}{\frac{s}{s_{z1}}\left(1 + \frac{s}{s_{p1}}\right)} \frac{\left(1 + \frac{s}{s_{z2}}\right)}{\left(1 + \frac{s}{s_{p2}}\right)} \tag{3-72}$$