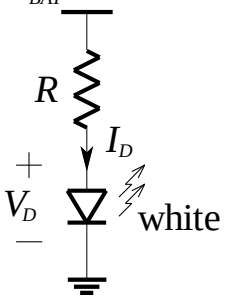
6 LED Driver Design

(a) A simple circuit used to "drive" an LED is shown below. The three voltages correspond to minimum, typical and maximum "forward voltages" for the LED.



	V_D (V) (aka V_F)	I_D (mA) (aka I_F)	Relative luminous intensity (%)
	$V_{D\min}$ =		
	$V_{D\,typ}$ = 2.8	20	100
	$V_{D\max}$ =		

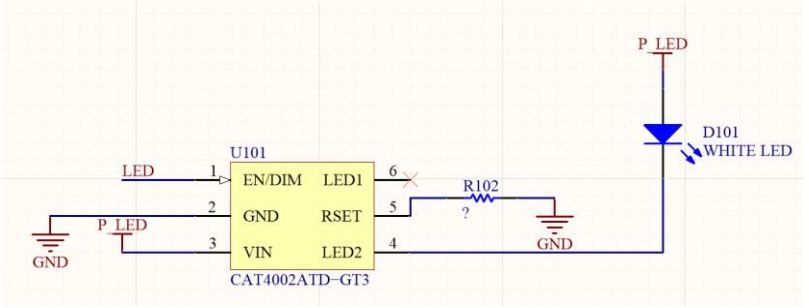
(i) Design the resistor R for the typical V_D and a current of $I_D = 20\,\text{mA}$.

(ii) Using information in the LED datasheet, and using a constant voltage drop model for the LED, determine the min. and max. LED currents.

(iii) Using Fig. 2 in the datasheet, estimate the relative luminous intensity.

What is the problem with this type of circuit for driving an LED?

(b) Using information given in the LED driver datasheet, design the following LED driver circuit so that the LED current is a constant 20 mA.



(This schematic is available as a separate PDF.)

There is a section on page 7 of the datasheet called "LED Current Selection". Use this formula to determine R102.

Use a 1% (E96) resistor.

What is the advantage of this circuit for driving an LED?