

## Punto 1 LABORATORIO

Creare tabella con tutti i parametri utili. Qui sotto riporto le formule che ho utilizzato per le incognite

$$\text{MAXCNT} \Rightarrow \text{decimale} = n_s - 2$$

$$\begin{aligned} &\hookrightarrow \text{binario} = \text{se } \text{MAXCNT} > 255: \\ &\quad \hookrightarrow \text{arrotondamento per eccesso di } \text{MAXCNT} / 16; \\ &\quad \text{risultato convertito in binario;} \\ &\quad \text{se no} \\ &\quad \hookrightarrow \text{MAXCNT convertito in binario} \end{aligned}$$

$$\text{DIVISOR} \Rightarrow \text{decimale} = \frac{f_{\text{CLK}}}{(\text{MAXCNT} + 1) \cdot f_{\text{PWR}}} - 1$$

$$\hookrightarrow \text{binario} = \text{vedi MAXCNT binario}$$

$$\text{REGISTER} \Rightarrow \text{decimale} = 8 \cdot (\text{MAXCNT} + 1)$$

$$\hookrightarrow \text{binario} = \text{vedi MAXCNT binario}$$

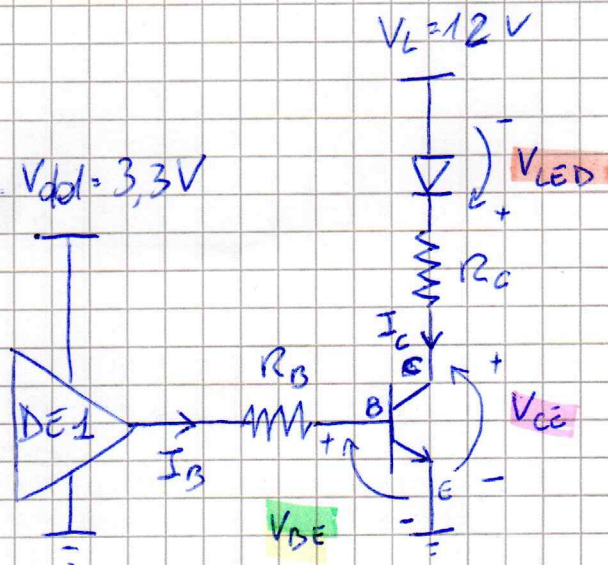
$$t_{\text{pwr}} \Rightarrow \text{calculated} = 1 / f_{\text{PWR}}$$

$$t_{\text{on}} \Rightarrow \text{calculated} = 8 \cdot t_{\text{pwr}}$$

$$t_{\text{off}} \Rightarrow \text{calculated} = t_{\text{pwr}} - t_{\text{on}}$$



## Punto 2 LABORATORIO



$$V_{LED} = 1,85 \text{ V} \quad (\text{guardare datasheet led})$$

$$V_{CE(SAT)} = 0,3 \text{ V} \quad (\text{guardare datasheet 2N2222A})$$

$$V_{BE(SAT)} \Rightarrow \text{min } 0,6 \text{ V}$$

$$\Rightarrow \text{max } 1,2 \text{ V}$$

$$I_B = 16 \text{ mA} \quad (\text{consegna del lab})$$

$$I_C = 20 \text{ mA} \quad (\text{consegna del lab})$$

$$V_{dd} = 3,3 \text{ V} \quad (\text{consegna del lab})$$

$$V_L = 12 \text{ V} \quad (\text{consegna del lab})$$

$$R_C = \frac{V_L - V_{CE(SAT)} - V_{LED}}{I_C} = \frac{12 - 0,3 - 1,85}{20 \cdot 10^{-3}} \frac{\text{V}}{\text{A}} =$$

$$= 492,5 \, \Omega \approx 500$$

$$R_{B \text{ MAX}} = \frac{V_{dd} - V_{BE \text{ min}(SAT)}}{I_B} = \frac{2,7 \text{ V}}{16 \cdot 10^{-3} \text{ A}} = 168,7 \, \Omega$$

$$R_{B \text{ MIN}} = \frac{V_{dd} - V_{BE \text{ max}(SAT)}}{I_B} = \frac{2,1 \text{ V}}{16 \cdot 10^{-3} \text{ A}} = 131,2 \, \Omega$$