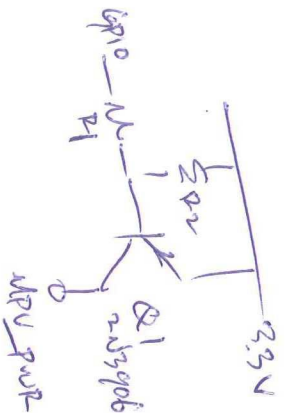


MPV 9250 Transistor Switch



$$I_C = 3.5 \text{ mA}$$

$$V_{CE} = 70$$

$$P_{Q1} I_b = \frac{I_C}{\beta} = \frac{3.5 \text{ mA}}{70} \approx 0.5 \text{ mA}$$

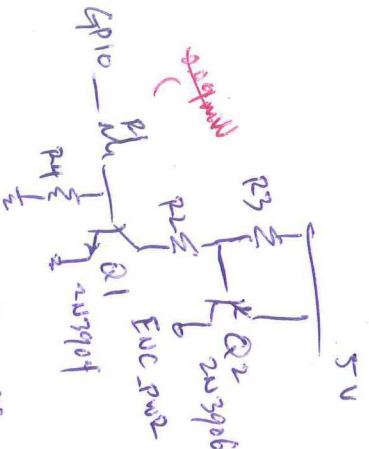
$$V_{CE, SAT} = 0.85 \text{ V}$$

$$R_2 = \frac{V_{CC} - V_{CE}}{I_C - I_b} = \frac{5 - 0.85}{3.5 \text{ mA} - 0.5 \text{ mA}} = 3.7 \text{ k}\Omega$$

$$R_2 = 10 \cdot R_1 = 36 \text{ k}\Omega$$

Safety
Coefficient

PLS ENCODER Transistor Switch



$$I_{C2} = 15 \text{ mA}$$

$$V_{CE} = 30 \text{ @ } I_C = 100 \text{ mA}$$

$$I_{B2} = \frac{15 \text{ mA}}{30} = 5 \text{ mA}$$

$$\text{assume } R_3 = 20, I_{C2} = I_{B2} = 5 \text{ mA}$$

$$V_{R2} = 5 \text{ V} - V_{CE, SAT} = 5 - 0.85 \text{ V} = 4.15 \text{ V}$$

$$R_2 = \frac{V_{R2}}{I_{C2}} = \frac{4.15 \text{ V}}{15 \text{ mA}} = 276.6 \Omega$$

$$R_2 = 3.8 \text{ k}\Omega$$

$$R_2 = \frac{V_{R2}}{I_{C2}} = \frac{4.15 \text{ V}}{5 \text{ mA}} = 830 \Omega$$

$$R_3 = 10 \cdot R_2 = 8.3 \text{ k}\Omega$$

$$R_3 = 6.2 \text{ k}\Omega$$

$$R_4 = 10 \cdot R_1 = 240 \text{ k}\Omega$$

$$R_4 = 240 \text{ k}\Omega$$

$$\text{choose } 24 \text{ k}\Omega \rightarrow \text{allow } 102 \text{ k}\Omega$$

$$0.09 \text{ mA}$$

$$V_{CE, SAT} = 0.85 \text{ V @ } I_C = 10 \text{ mA}$$

$$V_{R1} = 3.3 \text{ V} - V_{CE, SAT} = 3.3 \text{ V} - 0.85 \text{ V} = 2.45 \text{ V}$$

$$R_1 = \frac{V_{R1}}{I_{B1}} = \frac{2.45 \text{ V}}{6.5 \mu\text{A} \cdot 1.3} = 30.1 \text{ k}\Omega$$

Replace ~~240k~~ 240k

with PN2222A

BC 807/817