

2022/06/18

MAX16054A2T → push button on/off controller

Complementary output OUT & $\overline{\text{OUT}}$ (inverted state)

+2.7V ~ 5.5V single supply. this case 5V supply.

Closed switch: OUT high & $\overline{\text{OUT}}$ Low

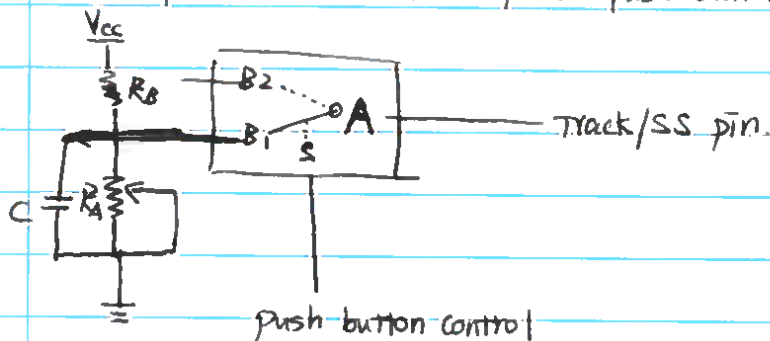
Again closed switch: OUT low & $\overline{\text{OUT}}$ high

$$V_{\text{out}} = (0.7 \sim V_{\text{CC}} - 1)$$

SN74LVC1G3157D3VR → Single channel single-pole double-throw (SPDT) analog switch

→ permits signals with amplitudes up to V_{CC} (peak) to be transmitted in either direction. $B1/B2 \leftrightarrow A$

Setpoint 1 ~ 2 Switch by the push button (click-switch)

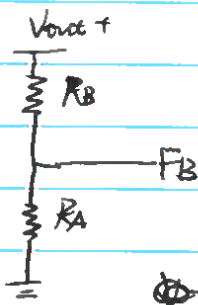


adjust setpoint 1 to 2V ⇒ B1 circuit
setpoint 2 to 4V ⇒ B2 circuit } V_{out} Track Supply.

~~$V_x = 2/4$~~
 ~~$V_x = 2 \text{ or } 4V$~~
 ~~V_{out}~~

$$\frac{V_x}{V_{\text{out}}} = \frac{R_A}{R_{\text{TrackA}}} \times \frac{R_{\text{TrackA}} + R_{\text{TrackB}}}{R_A + R_B}$$

$$\text{setpoint} = V_{\text{sc}} = V_x \times \frac{R_{\text{TA}}}{R_{\text{TA}} + R_{\text{TB}}} = 2 \text{ or } 4V$$



$$\frac{V_x}{V_{\text{out}}} = \frac{R_A}{R_A + R_B} \times \frac{R_{\text{TA}} + R_{\text{TB}}}{R_{\text{TA}}}$$

$$\frac{V_x \times \frac{R_{\text{TA}}}{R_{\text{TA}} + R_{\text{TB}}}}{V_{\text{out}}} = \frac{R_A}{R_A + R_B}$$

$$\frac{2 \text{ or } 4V}{V_{\text{out}}} = \frac{R_A}{R_A + R_B}$$

★ Setpoint 1/2

$$2 \text{ or } 4V = \frac{R_A}{R_A + R_B} \times V_{\text{out}}$$

$$V_{\text{out}} = (2 \text{ or } 4V) \times \frac{R_A + R_B}{R_A}$$

Setpoint \rightarrow 2V & 4V output voltage.

$$V_{out} = V_{SS} \times \frac{R_A + R_B}{R_A}$$

$$V_{out} = \underset{\substack{\downarrow \\ \text{here is 5V supply}}}{V_x} \cdot \frac{R_{TA}}{R_{TA} + R_{TB}} \times \frac{R_A + R_B}{R_A} = 2 \text{ or } 4 \text{ V}$$

\downarrow \downarrow
 setpoint 1 setpoint 2

$$V_{out} = 5 \times \frac{1.2k}{10k + 1.2k} \times \frac{499 + 82}{82}$$

3.796 V ✓ match LTSpice simulation.