



Category: FET

CIRCUIT IDEAS FOR DESIGNERS

Schematic no. fet_11140.0

Low Power Normally-ON Switch**Description**

This low power Normally-ON switch is controlled by the voltage applied at V_{IN} . There are two transistors used in this circuit, one zero threshold voltage N-channel precision MOSFET, M1, and one enhancement mode low threshold N-channel precision MOSFET, M2. The input, V_{IN} , is connected to the gate of M1 and biased by R3 connected to V_- . If V_- is grounded, V_{IN} is grounded and M1 is slightly turned on, causing a drain to source current, I_{DS1} , across M1. This current flows through R1 causing the drain voltage, V_{DS1} , of M1 to be pulled to ground. At this point M2 is turned off ($V_{GS2}=V_{DS1}$) with no I_{DS2} current flow, and giving an output voltage, V_{OUT} close to the supply voltage, V_+ . If V_- is connected to a negative supply voltage, M1 is now turned off, and there is very little I_{DS1} current, resulting in a small voltage drop across R1 and bringing V_{DS1} up close to V_+ . This large V_{DS1} in turn causes M2 to turn on, causing an increase in I_{DS2} and resulting in $V_{OUT} = V_+ - (I_{DS2} * R2) \approx 0$ volts. This circuit is operational with V_+ and V_- ranging from +5V to -5V as well as +0.5V to -0.5V. An external V_{IN} can override the voltage bias set by R3 and V_- to turn on and turn off this circuit externally.

For full schematic diagram and notes, please register and login at aldinc.com