

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 VIN. 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, VIN, is connected to the gate of M1 and biased by R3 connected to V-. If V- is grounded, VIN is grounded and M1 is slightly turned on, causing a drain to source current, IDS1, across M1. This current flows through R1 causing the drain voltage, VDS1, of M1 to be pulled to ground. At this point M2 is turned off (VGS2=VDS1) with no IDS2 current flow, and giving an output voltage, VOUT 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 IDS1 current, resulting in a small voltage drop across R1 and bringing VDS1 up close to V+. This large VDS1 in turn causes M2 to turn on, causing an increase in IDS2 and resulting in VOUT = V+ - (IDS2 \* 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 VIN 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

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