Category: MOSFET **CIRCUIT IDEAS FOR DESIGNERS** Schematic no. fet_11124.0

Micro-power Precision Normally-ON Power Switch

Description

This micro-power precision Normally-ON power switch is controlled by V_{IN}. When V_{IN} is at GND, the MOSFET (ALD1149xx) is in an ON-State, which generates a low impedance path across its V_{DS}, D and S terminals (R_{DS} = 5KΩ). R_{DS} and the 44MΩ resistor form a resistor divider, which resulted in the voltage at the gate (G terminal) of the power PMOS to be at near GND potential. This voltage turns the power PMOS to ON-State. V_{DD} is typically in the range of 2.0V to 5.0V. V_{OUT} sources up to 0.9A of output current from V_{DD}.

When power to the circuit that supplies V_{IN} is lost or when V_{IN} is in the high impedance open-circuit state, V_{IN} is pulled down by the 1MΩ resistor to V-. If V- is negative, such as at –2V, V_{IN} is pulled toward –2V, which turns off the ALD1149xx. The power PMOS gate voltage at G now charges to near V_{DD} voltage and turns the power PMOS off as well. When V- is supplied by the same power supply as that used to power the V_{IN} circuit, V- now defaults to V- = V_{IN} = GND and the ALD1149xx is in the ON-State, leaving the power PMOS in the ON-State as well. Applying V_{IN} = –2V would turn off the ALD1149xx and the power PMOS at near zero quiescent current for the entire circuit, as both MOSFET devices are essentially in the OFF-State. Current drain of the circuit results only from leakage currents of the ALD1149xx and the power PMOS. Precision switching voltage is the result of the circuit operation depending on the precision threshold voltage of the ALD1149xx.

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