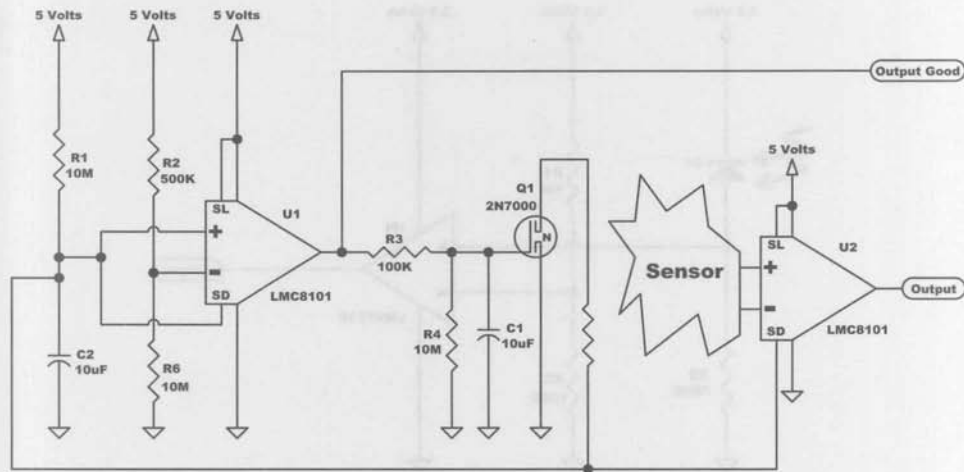


A micro micro micro Power Sensor Amplifier



The Art of Analog 5

This circuit uses an amplifier that draws a little more current than some we make. It achieves its low power consumption by using the shutdown function of the amplifier to only enable the circuit for a relatively small time before going back to "sleep" R1 slowly charges C2 with a time constant of 100 seconds. Since the "SL" pin is strapped high, the shutdown pin turns on 1.5 volts below the top rail, or at 3.5 volts. Both the timing and the sensor amplifier turn on at this time. The U1 amp output is low and remains so until C2 charges to within 5% of the top rail by virtue of the 10M/500K set-point created by R2 and R6. At this time amp U1 switches high. R3 limits the charging current into C1 and slows the response down a little. Q1 turns on as C1 is charged up past the MOSFET's threshold voltage of 2.1 volts. Since the FET switches in the 1M resistor across C2 the timing amp, U1 has enough time to fully charge C1 to 5 volts. This charge is held on the gate of Q1 even as the voltage on the shutdown pin drops below the hysteresis level inherent in the part's design. As both parts are put into shutdown the output of U1 goes high-impedance. Because the FET must turn off for C2 to charge back up again, there is a bleed resistor R4 that slowly dissipates the charge on C1, creating another long time-constant that keeps the circuit in low-power mode. After Q1 is sufficiently turned off, C2 can begin charging up again, repeating the process.