

## AD7416/AD7417/AD7418 Power-On Reset Circuit

By Donal McNamara

In many applications a large number of decoupling capacitors are used on the  $V_{DD}$  line to prevent any power supply noise being coupled into ICs. As a consequence of using these noise protection capacitors, the  $V_{DD}$  line takes longer to discharge to 0 V when power is switched off. If the time between power-off and power-on is short enough, it is conceivable that the  $V_{DD}$  line would have only discharged to a value as high as 0.5 V. The effect this has on the AD7416/AD7417/AD7418 is that not all of the internal circuitry will have fully switched off. Therefore, applying power before  $V_{DD}$  has reached 0 V can cause the AD7416/AD7417/AD7418 to reset into an unknown state. Figure 1 is a recommended setup in applications where the user expects the supply voltage discharge time to be too short for a proper power-on reset of the AD7416/AD7417/AD7418.

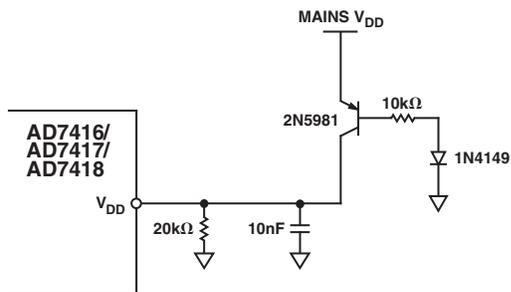


Figure 1. Power-On Reset Circuit

The PNP transistor in Figure 1 will start switching off when the main  $V_{DD}$  line connected to its emitter falls below approximately 1 V. At 0.5 V, the voltage on the AD7416/AD7417/AD7418  $V_{DD}$  pin is virtually 0 V. This circuit will ensure that proper power-on reset is achieved when power-off, power-on time is relatively short.

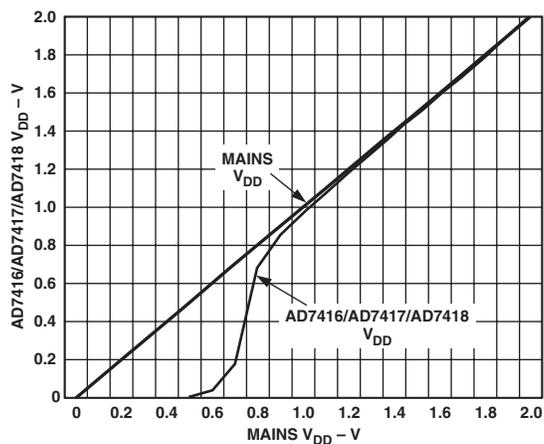


Figure 2. Voltages on Emitter and Collector of PNP Transistor in Figure 1

