



CY7C634XX and CY7C635XX USB Keyboard Families: Power-On Reset Considerations

There are two important cases of initial V_{CC} voltage considerations that the system designer using our USB Keyboard Microcontroller must be aware of and plan for. These are: (1) the slow voltage rise during a cold power-up of the host PC and (2) the fast voltage rise during hot-plugging into an already stable USB bus.

The USB Keyboard families have built-in circuitry that resets the Microcontroller during an initial V_{CC} voltage ramp. This internal circuitry can accommodate V_{CC} voltage ramp rates between 10 μ s and 200 ms, but is not able to differentiate between these four decades of variation.

The correct sequence for a USB hot-plug event is as follows:

1. Microcontroller experiences V_{CC} ramp (which must be constrained to be greater than 10 μ s).
2. Port 3 bit 7 is at a logic high with respect to V_{CC} during the voltage ramp (see next section).
3. No USB traffic occurs after the ramp so the device goes into suspend.
4. A Bus Reset takes the device out of suspend and the Microcontroller begins at the reset vector.
5. Device awaits for enumeration or loss of keep-alive.

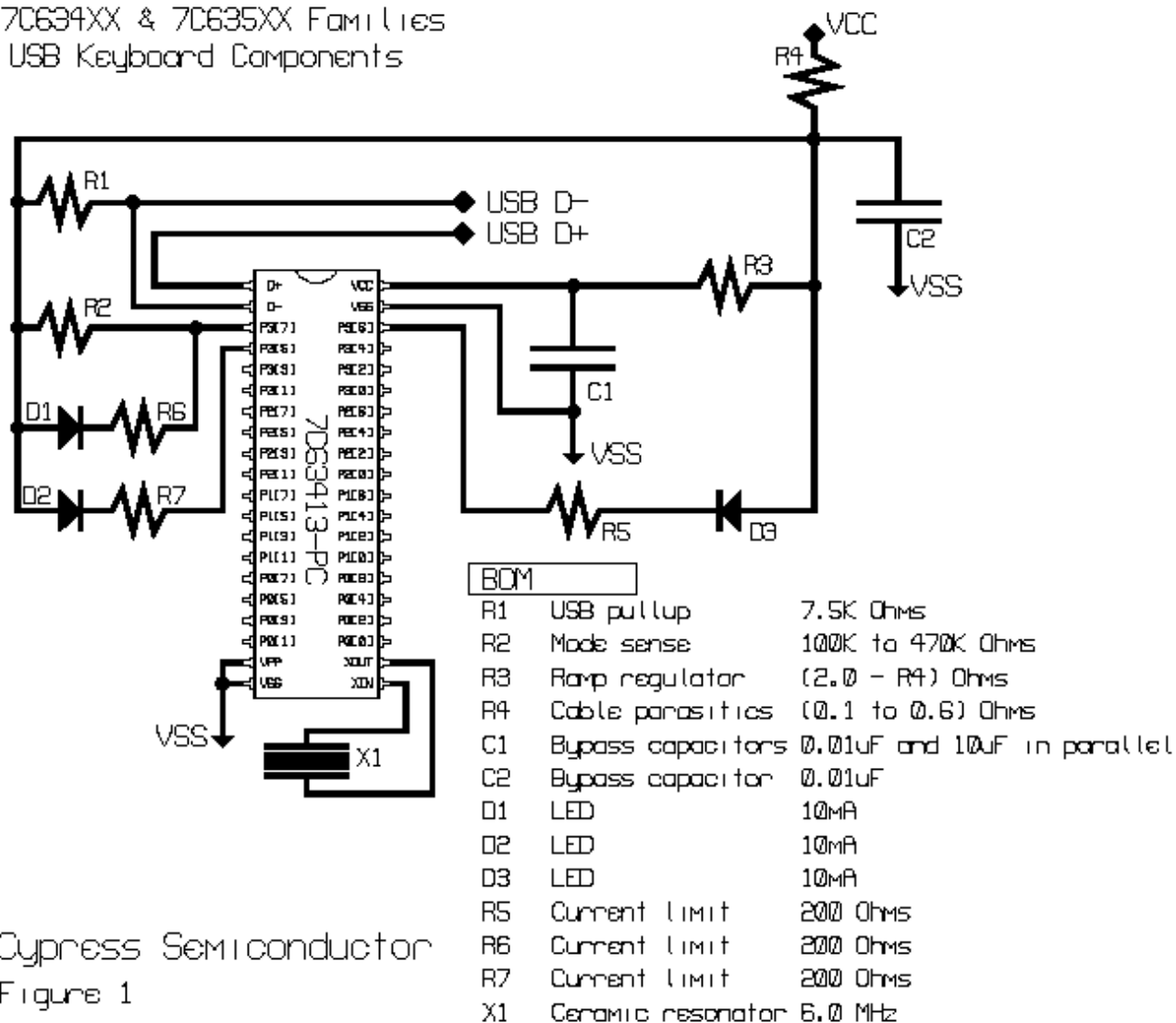
Our other USB Microcontroller families go immediately into suspend after the Power-On-Reset event (POR), however, the 7C634XX/5XX families have an extra mode that allows them to operate in non-USB applications. To support those applications, one of the LED ports pins (Port 3 bit 7) is used only during the POR event to distinguish between USB and

non-USB applications. This is documented in the datasheet in section 8.1, and is illustrated in the schematic diagram *Figure 1*, and is reviewed as follows:

1. Cable and connector resistance can be as small as 0.1 Ohms and as large as 0.6 Ohms in typical applications.
2. The RC time constant to the V_{CC} pin must be greater than 10 μ s.
3. The LEDs and R1 must be tied to the lowest resistance path to V_{CC} .
4. The V_{CC} pin must be bypassed for high-frequency noise (0.01 μ F).
5. The USB V_{CC} entry point should be bypassed for high-frequency noise (C2).
6. Port 3 pin 7 must be pulled to V_{CC} during initial V_{CC} voltage ramp, for USB operation.
7. V_{PP} must be tied to V_{SS} .
8. LEDs are driven by sinking current, and require current limiting resistors (R5,6,7)

To use the 7C634XX/5XX Microcontrollers in applications which require that the unit not go into suspend upon POR, the Port 3 bit 7 pin must be pulled to V_{SS} during POR (this mode is not shown in *Figure 1*). This precludes this pin from functioning as a LED driver, but does not destroy the utility of this pin. The value of the pull-down resistor from Port 3 bit 7 to V_{SS} can be any convenient value from 470K to 0 Ohms.

7C634XX & 7C635XX Families
USB Keyboard Components



Cypress Semiconductor
Figure 1

Figure 1.