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Spec No: 001-65921

Spec Title: AN65921 - CY7C634XX AND CY7C635XX
USB KEYBOARD FAMILIES: POWER-ON
RESET CONSIDERATIONS

Replaced By: NONE

AN65921

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

Author: Nelson Zhang

Associated Project: No

Associated Part Family: NA

Software Version: NA

Related Application Notes: None

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This application note provides Power-On Reset considerations for CY7C634XX and CY7C635XX family of devices when used for USB and non-USB applications.

Introduction

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 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.

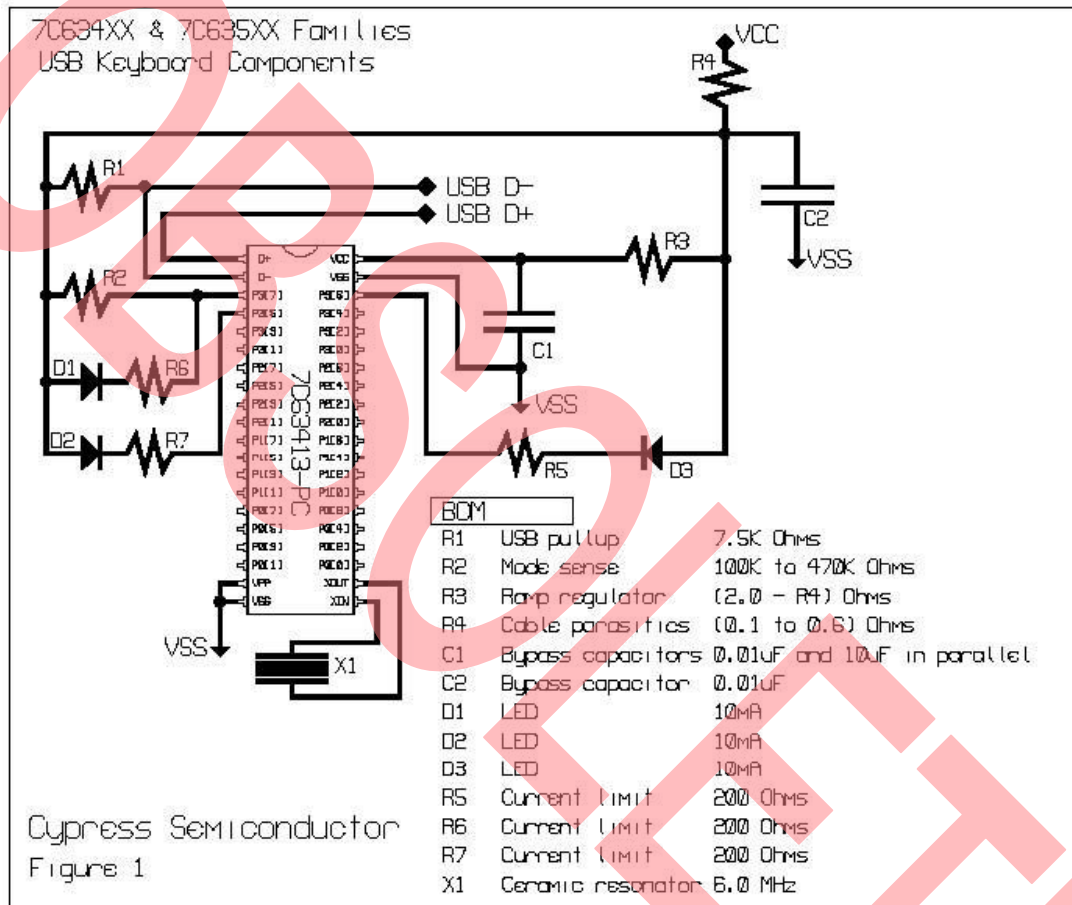
Our other USB Microcontroller families go immediately into suspend after the Power-On-Reset event (POR), however, the 7C634XX/5XX families have an extra mode that allows them to operate in non-USB applications. To support those applications, one of the LED ports pins (Port 3 bit 7) is used only during 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, R6, R7).

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 Vss 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 Vss can be any convenient value from 470K to 0 Ohms.

Figure 1. 7C634XX and 7C635XX Families USB Keyboard Components



Summary

This application note provides Power On Reset considerations for CY7C634XX and CY7C635XX family of devices when used for USB and non-USB applications. Also it documents the RC time constant values during cold boot or hot plug event.

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Document History

Document Title: AN65921 - CY7C634XX and CY7C635XX USB Keyboard Families: Power-On Reset Considerations

Document Number: 001-65921

Revision	ECN	Orig. of Change	Submission Date	Description of Change
**	3108802	NXZ	12/13/2010	Obtain spec# for note to be added to spec system. This note had no technical updates. Kindly replace existing .pdf file on cypress.com
*A	4228601	PRVE	12/21/2013	Added Summary. Updated in new template. Completing Sunset Review.
*B	5576736	PRVE	01/12/2017	Obsolete document. Completing Sunset Review.

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