

Re: Initializing a Flip-Flop on Power-up

Source: <http://sci.tech-archive.net/Archive/sci.electronics.design/2006-02/msg03010.html>

- *From:* Spehro Pefhany <speffSNIP@xxxxxxxxxxxxxxxxxxxxxxxxxxxx>
 - *Date:* Fri, 17 Feb 2006 12:12:05 -0500
-

On Fri, 17 Feb 2006 10:08:46 -0600, the renowned Dan Charette <dan@xxxxxxxxxxxxxxxxxxxxxxxx> wrote:

Hi All!

I've got a small toggle circuit that I'm using to drive a shutdown circuit on an audio power amplifier. The circuit is made from a CD4093 Schmitt trigger NAND configured as a debouncer for my mute switch input. The output of the 4093 is fed into a CD4013 to provide toggling capability. I've got S and R tied directly to ground. But, I'd like to explore the possibility of providing a predictable power-up scenario. Currently, the circuit upon power up will default to one state or the other. What are some methods that you fellas have used to achieve a known state consistently with a flip-flop like this when the power supply is from a single source. First gut instinct that I'm thinking is to make some sorta RC timing circuit on the power supply pin so that I can provide the set or reset pins with something known before the power supply pin comes up. Any thoughts? Also, I don't want to add too much additional circuitry... if I can solve this purely with passive components or a few transistors, that'd be great.

Thanks!

Use something like this to generate a reset pulse:

<http://ww1.microchip.com/downloads/en/devicedoc/11187f.pdf>

Only one part required. BTW, don't let the "microcontroller" in the description throw you, they are suitable for POR of any 3-5V CMOS logic circuit.

While you can use an RC (typically about 0.1s time constant with a diode to help out the protection diode to V_{dd}, a series resistor to limit the current in case of a V_{dd}-to-ground short, and perhaps a drain resistor from V_{dd} to V_{ss} to make sure that V_{dd} falls reasonably quickly), it's far from foolproof, more complex and not much cheaper. Another low-cost solution is to use a zener, a BJT and a few resistors, with or without the RC, but that consumes more power, and

Re: Initializing a Flip-Flop on Power-up

is even more complex.