

Re: Battery can't cope with regulator startup?

Source: <http://sci.tech-archive.net/Archive/sci.electronics.basics/2008-02/msg00176.html>

- *From:* Jamie <jamie_kallpa_not_valid_after_kallpa_@xxxxxxxxxxx>
 - *Date:* Thu, 07 Feb 2008 20:03:10 -0500
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swe_seeker wrote:

[As I don't trust my ASCII skills, I won't try to draw schematics or curves here. Images can be viewed here instead:]

Circuit schematics:

<http://thunderdome.myftp.org/diverse/battery/schematics.jpg>

Oscilloscope curve for D flip-flop, clk in - /Q out to D in loop - Q out

Without modifications, and with IC5:1 lifted, respectively(bad brand):

http://thunderdome.myftp.org/diverse/battery/curve_no_mod.gif

http://thunderdome.myftp.org/diverse/battery/curve_leglift.gif

Hi.

I use a 9V battery, a pushbutton and a D flip-flop to control /ENABLE for a voltage regulator. This works just fine most of the time, as long as I use one particular battery brand(I have two brands here at home, of course there are more out there). If I use the other, bad brand the flip-flop input starts to rise as it is supposed to, but halfway or something into the rise the voltage on the input pin dips. So the regulator /ENABLE never goes active. If I cut the connection between the flip-flop output and the regulator then the flip-flop output does what it should, i.e. go low to enable the regulator. On the other hand, if I use the good brand - or a variable power supply - the dip never happens. I've tried the same voltage as the bad battery, higher and lower as well, for both the good battery brand(have a few of them) and the supply. In both cases the circuit works. So my limited experience points me towards the battery :o].

Simple(open circuit voltage+voltage over ~120ohm resistor) measurements of the internal impedances in the batteries gives ~55ohm for the bad brand and ~8ohm for the good brand. Can that be the problem? My interpretation of the oscilloscope curves is that the input signal to the flip-flop is ok with the bad brand, but when the signal gets past the flip-flop and tells the regulator to get going it all dips, because the bad brand battery can't cope with it.

I've experimented a little with the decoupling, removing/adding capacitors to decoupling/signal path between battery and regulator, but no luck there.. Are the decoupling capacitors for 9V necessary? I mean, shouldn't there be enough margin down to the 3V out from the regulator - disregard Murphy's law - even if the 9V picks up some noise? Also, I'm not really sure whether to add/remove capacitance? More capacitance should help the battery when the circuit is enabled, as the capacitors - should have - had plenty of time to charge up before the button is pushed. But at the same time added capacitance means added load/strain for the battery. Or? All comments are welcome, as I'm new to this. Thanks in advance, and hope this makes sense :*].

Re: Battery can't cope with regulator startup?

You have an inrush problem ..

Try using a much larger cap on C13 and C16 and try to make them low ESR types.

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"I'd rather have a bottle in front of me than a frontal lobotomy"

"Daily Thought:

It smells around here "

http://webpages.charter.net/jamie_5

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