

Re: Step-down switching regulator advice ?

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*Source:* <http://sci.tech-archive.net/Archive/sci.electronics.design/2007-11/msg01499.html>

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- *From:* Winfield Hill <[hill@xxxxxxxxxxx](mailto:hill@xxxxxxxxxxx)>
  - *Date:* Sun, 11 Nov 2007 08:08:41 -0800
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On Nov 10, 8:01 pm, Eeyore (Graham) wrote:

mpm wrote:

Eeyore wrote

I need a popular (easily available), low cost step-down switching regulator suitable for an input voltage of up to ~ 18V that will deliver ~ 1A @ 11V with  $V_{in}$  ideally as low as 11.25V.

LM2575's switchers are pretty popular.  
Second sourced by ON Semi, and possibly others.

OK, got the data.

Not sure about the 0.25V drop though.  
And you'd need the adjustable one – requires 2 external programming resistors.

An adjustable one is just fine.

The low voltage drop is important to me. I suppose an alternative might be a buck-boost circuit. This would actually be even better suited to my needs. In which case my spec would be 1A @ 12.6V output with 11–18V in.

Let's try electronics design with Google.

In a panel at the right of your post in Google Groups is a "related pages" panel, where I see National

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Semi's LM2587 is recommended. Two clicks gets us to <http://www.national.com/pf/LM/LM2587.html> where we see that a simple flyback-transformer converter might work. In a panel to the right we see NSC's WEBENCH® tool to test the thought. OK, we enter 10 to 20V in, 12.6V out, 1.5A max, and press START YOUR DESIGN.

Oops, they want me to log on. Sigh. OK, press START again, and whammo, there it is -- our design, pretty routine, except a custom transformer is called out. But it's an easy one, with  $N_s/N_p = 0.78$ ,  $L_p = 23.4\mu\text{H}$ , and  $L_{\text{ell}}$  no more than  $0.47\mu\text{H}$ , or less than 2% of  $L_p$ , which is pretty easy to wind. They specify  $R_p$  under 35 milliohms, which should help pin down the bobbin's winding area, and a ferrite-core size. They say the LM2587 will dissipate 3.5 watts, so we'll need a heat sink clip on the TO-220 tab.

Hmm, DigiKey wants \$8.32 just for an LM2587 TO-220-5 IC. Maybe the \$10 TI module isn't so bad after all.

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