

Re: Step-down switching regulator advice ?

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- *From:* Joerg <notthisjoergsch@xxxxxxxxxxxxxxxxxxxxxxxxxxxx>
 - *Date:* Sun, 11 Nov 2007 17:07:18 GMT
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Winfield Hill wrote:

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 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

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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.

Every time I tried that I got a message that my design was not possible. All are in mass production now ...

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_{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.

3.5W at 11W out? Ouch.

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

Double-Ouch. I usually do SEPICs with the LM3478. About a buck in quantities and that external FET ain't expensive either. If it has to be dirt cheap I'll use a Schmitt inverter. And it usually has to be dirt cheap.

It's like TV dinners. Either they are bland or expensive. When you whip up your own from scratch it costs less and tastes better.

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Regards, Joerg

<http://www.analogconsultants.com/>

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