

## Re: Switcher psu woes

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"colin" <[no.spam.for.me@xxxxxxxxxxxxx](mailto:no.spam.for.me@xxxxxxxxxxxxx)> wrote in message  
[news:%74\\_g.3806\\$iq4.1720@xxxxxxxxxxxxxxxxxxxxxxxxxxxxx](mailto:news:%74_g.3806$iq4.1720@xxxxxxxxxxxxxxxxxxxxxxxxxxxxx)

Hi,  
Sometimes I think everythings against me,  
I decided to use the lm2727 synchronous smps controller for a cool runing  
regulator,  
(10-15v input 1.5A variable output)  
however it has undervoltage lockout not just on the input as I though but

on

the output,  
when the output drops below a certain point it actualy latches off and  
shorts out the output,  
wich means its very sensitive to sudden load changes,  
the lm2737 doesnt have the latch off feature but doesnt seem to be stocked  
by my suppliers,  
I managed to disable this feature with a diode clamp but now I find it  
disipates a considerable amount of heat when no load,  
it seems the synchronous rectifier lower mosfet remains on and conducts in  
the unwanted direction sinking current from the output, this 'feature' is  
described as source+sink capability.

As if that isnt enough after several blown top side mosfets I finally  
realised the gate voltage was being driven to 0v before the source had  
dropped to 0v, with close to the maximum 16v input voltage this meant there  
was -15v vgs wich is more than it can stand, although it was only for

about

20ns. a gate resistor got rid of this but made it too slow, there seems to  
be very little dead time, a diode vgs clamp proved better.

There is another chip tsp4005x with more pins wich is why I didnt chose it  
originally but is available with or without the 'sink' feature but gues

what

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my supplier only stocks it with the option, however it does appear that it drives the top mosfet gate to vs rather than 0v

Not to mention my dual mosfet tssop-8 pmwd18un actually turned out to be common drain instead of a dual pair which wasn't mentioned on the catalogue page and I didn't look long enough at the data sheet.

The final thing is that with the paralleled tssop-8 devices which gives an  $r_{ds(on)}$  of ~10m ohm they seem to dissipate more power than some spare stn3nf06l 0.1 ohm mosfets I had, is this due to the particularly low gate threshold perhaps, or are those tiny packages really not able to take the current ?

Fortunately the rest of the circuits on the board seemed to work ok.

Well I built another synchronous dc-dc converter on a little board to test a tps40054, and guess what it worked first time ! works quite well, think I'll have to lose the feedforward as I'm not clear how it affects the max duty cycle, but no biggy, seems to run very cool. I decided to use d-pack fets instead of those flimsy tssop. these seem to be more popular than sot233 now.

This is source current only so under fault conditions it does not short out the output which when driving a largish motor or with a largish output capacitor kinda wholops the lower MOSFET.

Fits nicely in a wallwart, also added a synchronous ac rectifier too which recovers a couple more volts.

I'm impressed with the organisation of the pin out, for once it's arranged so that the circuit can easily be made on one layer. in fact the datasheet shows the circuit with the actual pin out and only 2 wires cross, fortunately each trace can pass under a capacitor.

Annoyingly my supplier Farnell had this device all along but it didn't show up in their parametric search nor in the TI parametric search, what's up with these people don't they want to sell these devices ? it's so identical to the tps40050 I can't tell any difference in the data sheet.

Colin =^.=

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