

## Re: Switcher psu woes

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- *From:* Colin <cs.mullis@xxxxxxxxxxxx>
  - *Date:* Sat, 21 Oct 2006 00:37:36 GMT
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colin wrote:

Hi,  
Sometimes I think everything's against me,  
I decided to use the lm2727 synchronous smps controller for a cool running regulator,  
(10-15v input 1.5A variable output)  
however it has undervoltage lockout not just on the input as I thought but on the output,  
when the output drops below a certain point it actually latches off and shorts out the output,  
which means it's very sensitive to sudden load changes,  
the lm2737 doesn't have the latch off feature but doesn't seem to be stocked by my suppliers,  
I managed to disable this feature with a diode clamp but now I find it dissipates 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 isn't 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 which 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 which is why I didn't choose it originally but is available with or without the 'sink' feature but guess what 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.

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The final thing is that with the paralleled tssop-8 devices which gives an  $r_{ds(on)}$  of  $\sim 10\text{m}\ \Omega$  they seem to dissipate more power than some spare stn3nf06l 0.1  $\Omega$  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.

Colin =^.^=