Re: UC3843 power supply help needed!!!

Source: http://sci.tech−archive.net/Archive/sci.electronics.design/2005−05/msg02240.html

- *From*: "petrus bitbyter" <pieterkraltlaatditweg@xxxxxxxxxxxxxxxxx>

- *Date*: Tue, 17 May 2005 10:52:54 +0200

<seegoon99@xxxxxxxxx> schreef in bericht
news:1116310676.797823.110320@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
>
> colin wrote:
>> <seegoon99@xxxxxxxxx> wrote in message
>> news:1116227614.747750.258110@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
>> Hi to all.
>> I have built a power supply using a uc3843 chip and need some help.
>> The supply takes 220Vac and steps it down to 14Vdc(approx).
>> I have managed to get the supply working OK , but I still need a bit
> of
>> help.The schematic is attached , in LTSpice format.I modeled the
>> schematic and it seems to be ok , but I'm not sure how much you can
>> trust a simulation it this sort of level.
>> I've attached the model file for anyone who would like to simulate
> the
>> schematic. Hope it does not make the file to big , but I don't have
> any
>> access to any other binary groups to send it to.
>>
>> When I first powered up the circuit the output was very noisy , and
> got
>> worse as the load increaced.I found by lots of trial and error that
> if
>> I put a small(100pF) cap across R11(3k3) the output stabilizes and
>> everything seems good.There is a bit of high frequency noise on the
>> output at the switching frequency , but I am sure this is to be
>> expected.
>> Now the problem...
>>
>> I found by checking the drive to the FET that the loop seems unstable
>> at certain loads.As I increace the load from 0A to 2.5A
>> you can see the gate drive pulse width increacing as expected , but
> at
>> certain loads it seems to jump all over the place and the scope can't
>> trigger.From about 300mA to say 1,5A the gate drive is a mess , and
>> after that it seems to settle down nicely.
>>

>> How do I go about fixing this.It does not seem to be causing a
> problem
>> on the output , but I would like to fix it up anyway.
>> I am sure it is a loop/compensation problem , but I am not sure how
> to
>> go about fixing it.I have tried changing the gain resistor(R5) to
> 100k
>> and 147K to no avail.Same with the compensation cap C2(100p / 200p).
> I
>> have also fiddled with the resistor/cap combination around the TL431
> ,
>> also without much luck.
>> I am not very experienced with this type of power supply , so I am
> in
>> the dark a bit!!
>> It may also be a board layout problem.I did the board in a hurry
>> and did not pay HUGE amount of attention to layout , but I did try
> and
>> keep high current areas away from control lines etc.It is single
> sided.
>> This is a sort of hobby project , so time is not really of the
>> esscence. I only have a scope and meter to work with , so any
> solutions
>> that involve using other expensive equipment will be out of my
>> capability.My maths is also not very hot , so any solution that
> involve
>> lots of complex maths may be beyound me , but post them anyway as the
>> may be of interest to someone else.(they will be of interest to me ,
>> even if over my head!!)
>>
>>
>> ive used this chip in probaly a dozen designs, its a realy neat
> little
>> package, i cldnt load your circuit, but if u cld post a jpg il have a
> look
>> at it, the spec sheet for this device is realy good, if u have loop
>> stability problems you realy need to analyse your loop
> charecteristics
>> carefully.
>>
>> with opto feed back you need to acount for the wide variation in loop
> gain
>> they can have.
>>
>> some designs rely on a smal amount of esr in the output caps to
> ensure
>> stability, although persoanly i would try to avoid this.
>>
>> with current mode control its realy easy to charecterise the output,
> its
>> just like a big integrator, so

>> any roll of in the rest of feedback loop needs to occur when the
> overall
>> gain is less than 1. finding the loop gain at wich it becomes
> unstable and
>> reducing it by a factor of 2 or so is one posibility.
>>
>> Colin =^.^=
>
>
> Hi there. I don't have any access to any other groups , how can I post
> a jpg to this group?
> Do you have an email I can send it to.
> Cheers
> Rob
>

Rob,

Consider to use Andy´s ASCII−Circuit
www.tech−chat.de

petrus bitbyter

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- ***References***:
  - ♦ ***UC3843 power supply help needed!!!***
    - ◊ *From:* seegoon99
  - ♦ ***Re: UC3843 power supply help needed!!!***
    - ◊ *From:* colin
  - ♦ ***Re: UC3843 power supply help needed!!!***
    - ◊ *From:* seegoon99

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