常见问题:

LED D1 D2不亮

P5~P6

mdr30:

Leds close to big caps(LED D1 D2 in schematic) light up, then dies. Same thing when powering up once again. Other leds unaffected. Amp boards OK (Dynalo). Any ideas what it could be?

mdr30:

Thanks for info - seems the voltage was just at the limit of the regulator's range. Changed back to original 1,5K resistors (from 1,8K) so now DC out is 19,5V (before 21,5V) from a AC18V transformer. All leds are on. Problem here is the mains moving from 210 to 230V and those swings seem to affect the whole GRLV system.

KG:

and this is why I try to design for the lowest dropout voltage possible. Especially true on the high voltage supplies.

But still you have to have enough to work with at least 5% low line voltage. so you need a different transformer.

P10

Pars:

Built up a GRLV Plus board set for 35Vdc.

Testing with a variac at ~20Vac in or so, output is around 20Vdc.

However, D1 is not lit, and Q1 Vce is 0V.

I've gone thru and checked that I have PNPs/NPNs in the right places, right parts, caps in correctly, etc.

Changed out Q1/Q3/Q14, same problem.

LED is in right as well. Scratching my head right now.

Q14 Vbe 0.65Vdc

EDIT: why that would be the opamp locking up Dave...

Raised the voltage on the variac and things snapped right into place.

35.112Vdc out, from what I could measure unshielded on my HP3468, around 48uV of AC noise on output.

DC out very stable. 36Vct split bobbin putting out 44Vac unloaded so will need to use a different transformer.

Never put it up to line on the transformer, but nothing running hot.

Dropping around 14Vdc c-e on the pass transistor at 40Vac input.

P12

Mirko:

Hi guys, just built the GRLV plus version but I have encountered some problems.

It is configured R8=860R, R7=1500R which would give me roughly 15,4V. But here is the problem VAC is 16 and im getting 17.8V DC..

Red led D1 is not lit but D9 is. Checked the leds and transistors, everything seems to be working.

Pars:

That sounds similar to a problem I had with one of mine (2 pages back in this thread) when I brought it up on a variac.

D1 was lit, but D9 not.

Input voltage was too low and the opamp was locking up.

Is your transformer actually putting out 16Vac?

That should be plenty for a 15Vdc output.

作者解读

P1

KG:

the noise spikes are 120hz (100hz for you) and due completely to the switching noise

of the input diodes. every power supply, even tube rectified ones do this. The idea

is to remove the spike noise, and its not easy. caps across the diodes, etc, just does not

work.

and by the way, so far, I can't even get close to these numbers with a shunt regulated

supply, the noise rips right thru the main current source.

7815 is rated at 90 microvolts of noise (ti datasheet). which is great except that in the typical configuration

the diode noise rips right thru, and is usually in the millivolt range. and the voltage stability

is +/-4% over commercial temperature range. plus line and load regulation.

S22, same thing, the capaci?tance multiplier at the input is useless. Some companies in

the stupidly overpriced 3 terminal replacement business call this a gyrator. Nope, not a gyrator.

yes it can regulate at 3V, but you don't want to do that. What you might want to do is use

that voltage to calculate line voltage -15% for the absolute minimum voltage. Then make

sure all the components are rated for line voltage +15%

its all about heat in the pass transistors.

if you want to go down to 8 volts, you have to change the series zener to 4.7v

that zener is there to make sure the thing starts up under load.

and change the reference to 5v?

here is the original design that was modified by ucc, then modified ?by me.

http://waltjung.org?/PDFs/Improved\_PN\_Regs.pdf??

需要学习这个文章,了解整个工作原理和设计思路

P2

mwl168:

Does it matter what forward voltage LED to use so long as D2/D8 and D1/D9 match?

KG:

nope

P3:

Pars:

1) The 1N4007 diodes are not shown in the schematic.

Could I use 1N4001/4002 here (have them on hand)?

I'll trace them out on the board to figure out where they are, unless they are in the updated schematic.

2) The 2K resistors (R13/R14) and the LED between the + and - output: what is their purpose?

I noticed that Kevin had not put the LED in, and others completed boards as well were missing these. A dummy load for testing?

ang728:

1N4007 is for protection as shown below, 1N4002 would be better if you only have 4001 and 4002

LED between + - rails can be power indicator and simple load to help discharging caps.

P16

rumia:

i think if you want to adjuste the voltage via rv2/rv1 you don't need the resistors in r7/r8 , r9/r10.

maybe someone can correct me if i'm wrong, i think either via r7/r8 , r9/r10 or via rv2/rv1, not both.

KG:

You need all the resistors if you want to adjust the voltage. Otherwise too noisy. The adjust is calculated for about .1% range

KG:

the pot and the 2 associated resistors are the optional parts.

and the values of the resistors change depending on what voltages you want.

none of the 4.5 digit dvm's are accurate enough.

Especially since if you reverse the leads you get different numbers.

In fact 6.5 digit dvm's are just barely enough and the keithely ones in particular read different numbers if you flip the leads. The agilent ones do not.

7.5 or 8.5 digit dvm's highly recommended.

Wink:

Agilent 4401A is a good 6.5 digit meter

Agilent 3458A is just about the tops..... 8.5digit. We used to use them to calibrate the DC voltage on the Fluke 3500A and 3520A calibrators.

The AC voltages required an AC measurement standard like a Datron/Wavetek 4920 or Fluke 5790A/B as the Agilent 3458A was slightly too soggy.

P22

KG:

The opamp needs to be able to run on what the output voltage is,

and the zener plus 1.4V has to be less than the desired output voltage.

KG:

The Zener voltage minus 1.4V (darlington) plus about 1 V across the control transistor specifies the minimum output voltage.

The zener guarantees enough start up voltage to power up the opamp

so something like 8v with a 5v reference