



"Simpler Simplistic" Shunt regulator

Simpler Simplistic HV. Salas Nov 09

Only for Diy

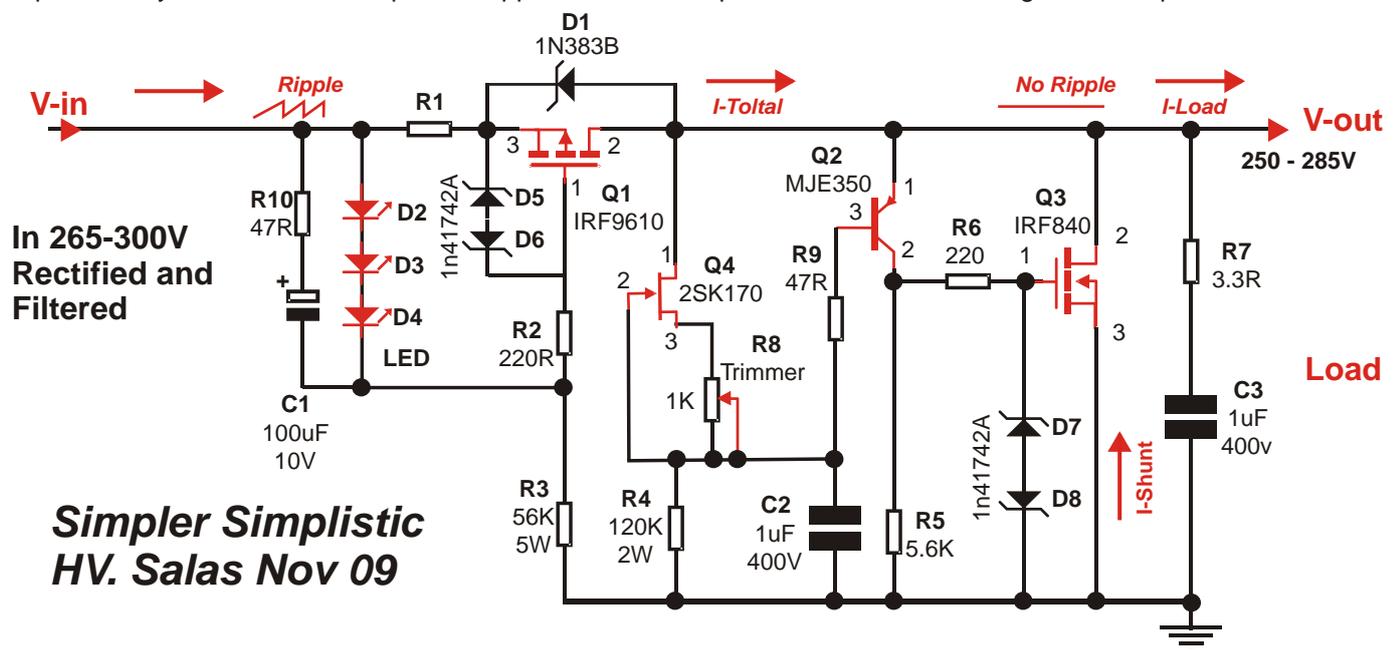
INFORMATION

Hello all,

As impressed as I was from the subjective performance of my recent low voltage shunts for my NJFET RIAA (link), I developed high voltage ones for my tube gear too. The first test has been done powering the Steve Bench cascode 12AY7 parallel & 6DJ8 RIAA. A phono circuit is the most sensitive one so to fully test a reg PSU IMHO. The previous reg was a Mosfet Maida. In brief: 1. Lower noise than with the Maida, in CDP background silence territory now. 2. Bass definition and slam, image focus, image size, mid and high smoothness, one class higher with the Mosfet shunt. Maybe a 25% overall subjective performance lift above the Mosfet Maida.

You can see in this link

[Http://www.diyaudio.com/forums/power-supplies/134801-simplistic-mosfet-hv-shunt-regs-97.html#post2084348](http://www.diyaudio.com/forums/power-supplies/134801-simplistic-mosfet-hv-shunt-regs-97.html#post2084348)



**Simpler Simplistic
HV. Salas Nov 09**

The circuit above has been checked enough, its stable, and it can go over 300V if the MJE350 is substituted with a proper PNP driver transistor like the 400V MPSA94 etc. R3 should be 82K & R4 220K in an over 300V application. The MJE is better if you target lower than 300V. The higher resistive load (R5) on the error amp than what I usually practiced, saves in driver BJT's heat and helps its stability in higher voltages without any performance penalty. Sometimes I use optional protective Zeners for added mishandling safety. Not strictly necessary though. Just use D1, does most safety. 15V DC IN-DC OUT is the lower limit for adequate performance. No less than 20mA must be left running in the shunt on top of what the load demands. Here is it again showing the proper application of safety Zeners. Also a point 2 point example of mine in the second picture.

Here is how it simulates. Good stability margin, nice enough PSRR, and about 10 mOhm Zo, that does better the more we overspec current and heat. But don't sweat it, cabling is going to dominate on Zo. Of course those are just the trends, usually is worse enough for numbers in real life. The concept has been used by enough people reporting in this thread since its inception with some variation up to now. Seems like accepted as balanced enough between simplicity, relative performance, and popular subjective commentary. Thanks for your participation.

D5 & D6 are for transients by mishandling. Work for any Mosfet regardless of the circuit's DC levels, its for avoiding gate punch through. D1 is a 150V 5A Zener so to protect the CCS Mosfet when there is potential to see over 200V (its max spec), say in an accidental swift short. If your DC In is not over 200V in the first place, that Zener is redundant. That said, there are many examples of finely working Simplistic Regs in this thread for a long time without Zeners. Its for when plugging or unplugging carelessly or tweaking, recycling on/off etc. Just to know how to apply.

Salas Nov 09

