

Shunt Regulator for HB-DAC boards

1. Introduction

As described in “ALL-FET low-noise SUPER-SHUNT regulator” a shunt regulator can outperform any other regulator regarding transparency, dynamics and other sound performance. So it also makes sense to add a well designed shunt regulator to the DAC board, too.

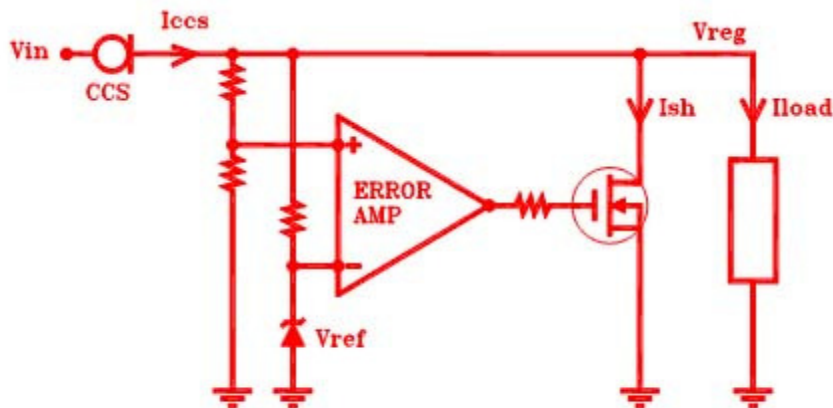


Fig. 1

On the next page you can see the shunt for the HB-DAC1704 or other low voltage application. This is a complete power supply including high speed diodes for rectification and 100.000uF of highest quality capacitors (Rubycon ZLH low ESR). The circuit is based on the schematic in Fig. 1. The error amplifier is done by low noise transistors but with an extra current source for higher gain. The CCS und VREG MOSFET transistors are the rugged 2SJ200 and 2SK1529 types. In addition big heat sinks are added which can handle a lot more of power than what is needed for the DAC boards. The PCB is a special board with 3 times thicker copper traces than normal PCBs (105um Cu). All power traces are built in planes for lowest impedance path. All you additionally need is a transformer with +/- 9VAC and 50VA. All resistors (except metal foil power resistors) are Vishay dale CMF 55 resistors, all capacitors are WIMA polypropylene, all electrolytic are Rubycon and Panasonic FC types.

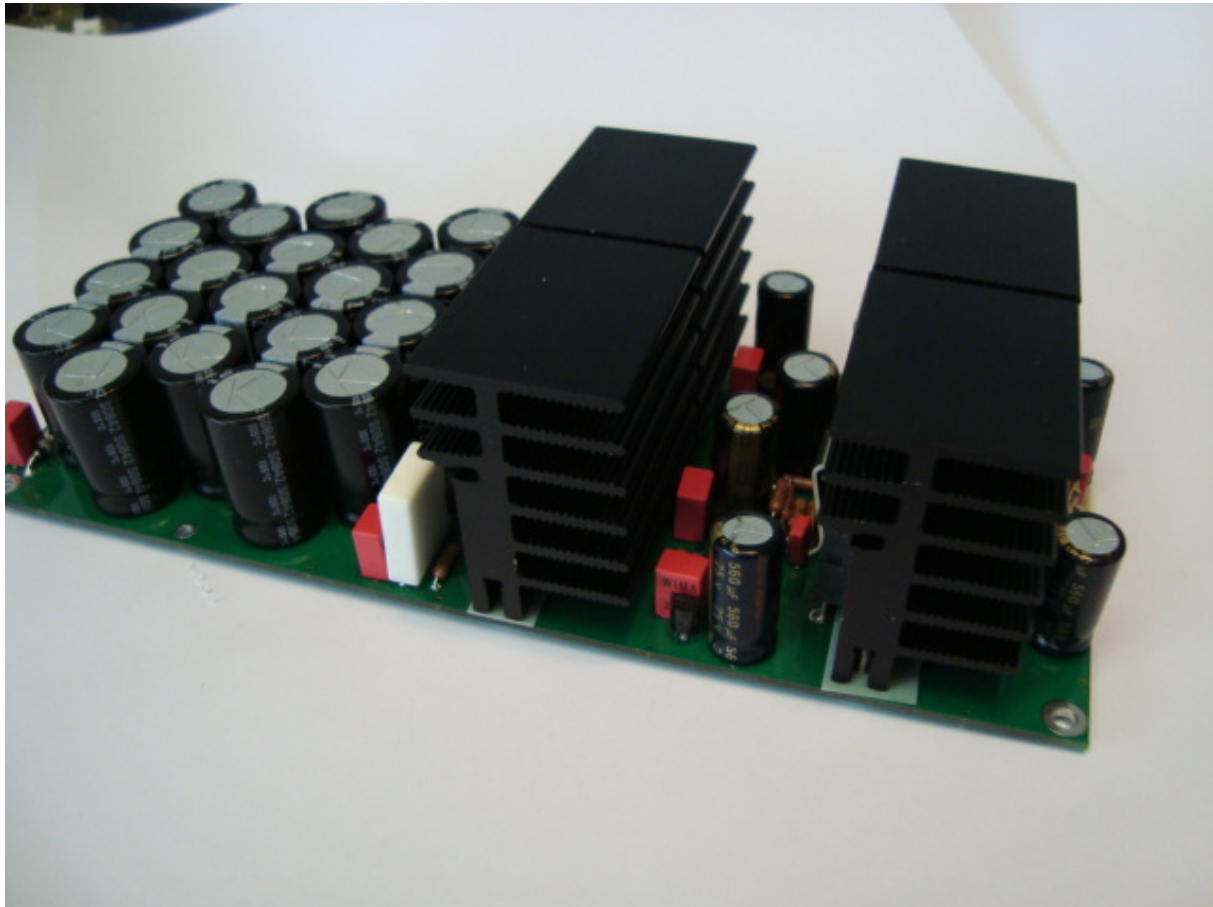
The board is fully assembled and tested for +/-5V, which is needed for the DACs.

The output of the power supply current is adjusted to HB-DAC power requirements but could be changed by replacing one resistor per output voltage.

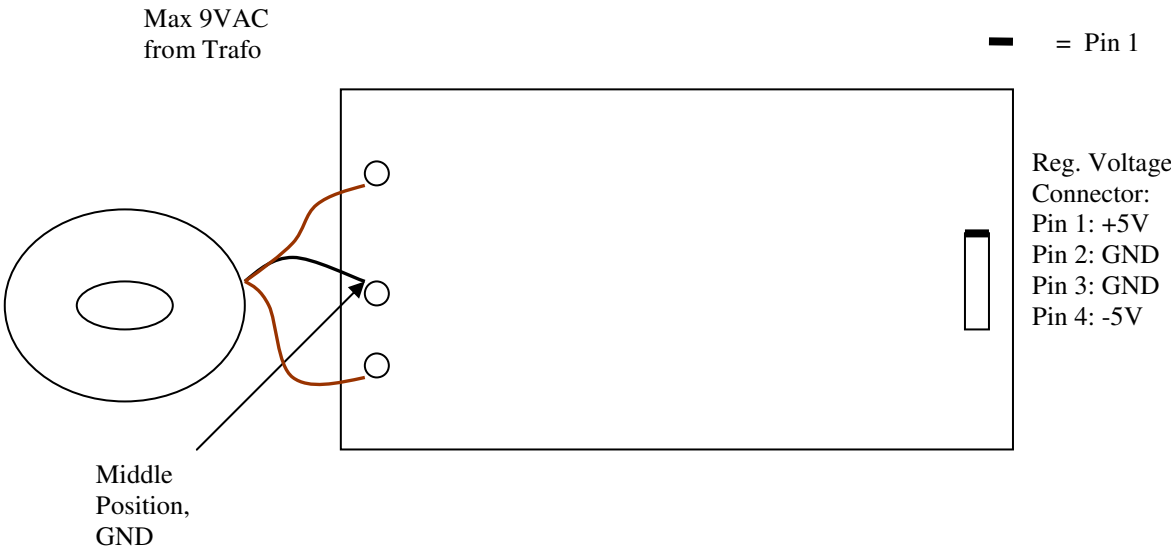
Please take care not to connect a transformer with a voltage higher than 9VAC. The DC input voltage (after rectification) may not exceed 15V DC!

2. Characteristics of Shunt Regulator

- PCB: 2 Layer, 105um Cu thickness
Dimensions: 190.2 mm x 77.4 mm, height: 50mm
- Supply voltage input: max. 9Vac
- Supply voltage(s): +/-5V +/-5% regulated
- Supply current: typ. 290mA for +5V, typ. 290mA for -5V, constant current flow.
- Noise at outputs 1.62uV rms, measured with R&S audio analyser



3. Connections



4. Dimensions of Mounting Holes

