

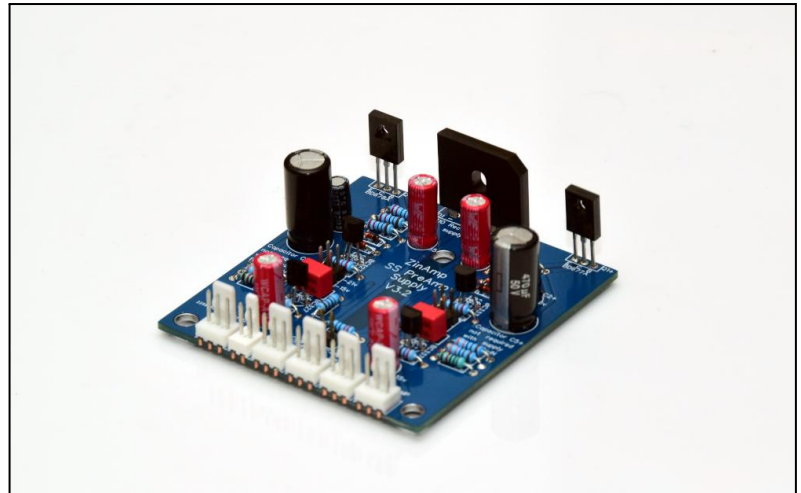
Application & Purpose:

Active linear regulator for DC supply voltages to solid state phono & pre-amps and active crossovers, running at -21/+21v, -15/+15v, or -12/+12v.

Requires an AC or a DC supply. AC supply requires a rectifier fitted. An AC transformer of 2x18v min 20VA. Max AC voltage 2x30v.

Can also be supplied from a DC wall-wart / adaptor - min 30v.

WARNING: High DC voltage device. Care must be taken to avoid fatal electric shock.



Note: The dimensions of this PCB can be changed to suit custom enclosures. Email: parts@zinamp.co.uk with your requirements

Specification:

PCB Dimensions	72.5mm x 68mm x 1.6mm
Voltage Input	DC - min 30v, max 50v AC transformer (min 20VA) - min 18-0-18v max 30-0-30v
Output Current	max 400mA - typical idle 150mA
Output Devices	BD 677A - NPN - darlington BD 678A - PNP - darlington
Ripple	0.1 - 2mv - depending on load
Output Voltage	Split rail -/+12v, -/+15v, -/+21v - selectable with jumper switches

Details:

Power supply for running ZinAmp Solid State Phono & Pre-Amps and Active Crossover modules. ZinAmp active crossovers run at -/+15v or -/+12v and this can be selected using jumper switches on the PCB. Do not run ZinAmp crossovers at -/+21v.

This module can be supplied by either a DC supply or an AC transformer. An AC transformer needs to be minimum 18-0-18v and maximum 30-0-30v. Min 20VA, pref 30VA.

WARNING:

DC Supply must not exceed +/-50vDC | AC Supply must not exceed 2x30v

Output devices are power darlingtontons to ensure amplifier linearity with all transient signal demands. Linear regulation is achieved with a feedback circuit that eliminates ripple and ensures rails do not ‘dip’ with large transient signals e.g. bass notes.

A small heatsink is required as a moderate amount of heat is dissipated from the output darlingtontons. The heatsinks supplied with your ZinAmp are ample for this. Running this supply with no heatsink will result in device failure within a few minutes. Secure to the heatsink and isolate the backs of the output devices from the metal-wall of the chassis if the output devices have metal backs. The output devices specced here have metal backs, so isolation pads are necessary. If you substitute these devices for ones of a similar spec and they don’t have metal backs, you can omit the isolators. Exposing metal backs of the output devices to the metal chassis will result in a short circuit and must be avoided.

Outputs and Voltages:

- Phono Amp - (-21/+21v DC) - switchable to 15 or 12v
- Pre-amp (-21/+21v DC) - switchable to 15 or 12v

Dissipation and Heat - please read this!!

A regulated supply will dissipate heat. The amount of heat will depend on the difference between the input and putput voltages (known as the regulation headroom) and the current being drawn by the load.

The most heat will be dissipated where we have a very large regulation headroom and a high current draw. Heat can be reduced by ensuring the headroom is a low as possible. Optimally, this needs to be about 10-15%. The following table describes the optimum input voltages for given output voltages:

Output DC Voltage	Miniumum Input Voltage DC	Miniumum Input Voltage AC	Headroom
-/+12v	-/+14v (28v across rails)	2x10v	15 %
-/+15v	-/+17v (34v across rails)	2x12v	12 %
-/+21v	-/+24v (48v across rails)	2x18v	16 %

It is possible to run with higher dissipation headrooms. The trade-off is more heat and a larger heatsink will be required.

WARNING:

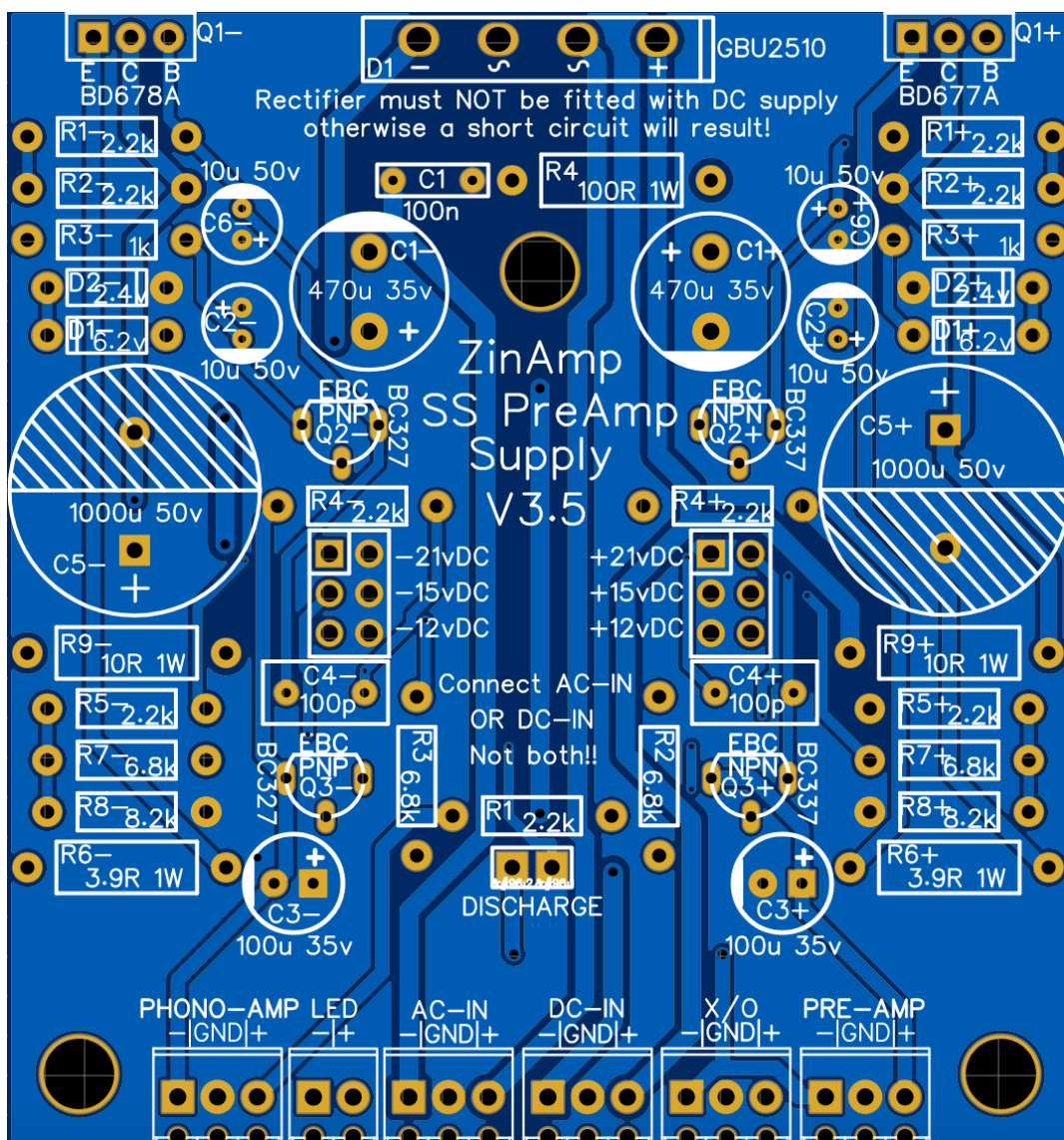
DC Supply must not exceed +/-50vDC | AC Supply must not exceed 2x30v

Safety:

WARNING: High DC voltage device. Care must be taken to avoid serious electric shock.

Always discharge the supply before removing and/or handling. A discharge terminal is provided that discharges the capacitors through a resistor without sparking. Switch off the amplifier, remove the AC power cord and place a screwdriver across the discharge terminals for 10 seconds. Test the voltage with a meter - if less than 2v, it is safe to handle. **NEVER attempt to discharge the supply with AC power connected, EVER!! You will blow the discharge resistor and probably damage the filter capacitors and output darlington's**

IMPORTANT - when using a DC supply **DO NOT** fit a rectifier to the PCB, otherwise the DC supply will be **shorted** via the rectifier. You may see smoke if this happens!



Blank PCB

Parts List:

CONNECTORS: Both blank and ready-built PCB requires connectors be purchased and soldered on by the constructor. This is to give the constructor a choice of how they wire their own particular installation. Terminal block connectors are indicated in the list below in [blue](#) and can be swapped for equivalent 2.54mm pitch connectors e.g. Molex KK254 headers, which are provided to the constructor in self-wire kits.

NOTE: C5+ and C5- can be omitted if using a DC supply. These are smoothing caps for the rectifier and are not required for DC operation. However, you may still choose to include them for extra DC smoothing - particularly if you are powering a phono-amp. For a line-preamp, they are unnecessary.

Designator	Value/Spec	Qty	Manufacturer	Manufacturer Part	RS Part
C1	100n	1	EPCOS	B32529C1104J189	241-6571
R1,R1+,R1-,R2+,R2-,R4+,R4-, R5+,R5-	2.2k	9	Vishay	MRS25000C2201FCT00	683-3449
H1+,H1-	PZ254V-12-6P	2	Harwin	M20-9970346	681-2931
R7+,R7-, R2,R3	6.8k	2	TE Connectivity	LR1F6K8	148-691
C5+,C5-	1000u 50v	2	Chemi-con	EKY-500ELL102MM20S	812-2820
C6+,C6-,C2+,C2-	10u 50v	4	Panasonic	EEUFC1H100L	571-256
R9+,R9-	10R 1W	2	TE Connectivity	ROX1SJ10R	214-0879
R8+,R8-	8.2k	2	TE Connectivity	LR1F8K2	148-714
R6+,R6-	3.9R 1W	2	TE Connectivity	ROX1SJ3R9	214-0813
C1+,C1-	470u 35v	2	Vishay	MRS25000C6801FCT00	683-3979
AC-IN,DC-IN,PHONO-A MP,PRE-AMP,X/O	- GND +	5	RS Pro	790-1092	790-1092
Q1-	BD678A	1	STMicro	BD680	109-090
Q1+	BD677A	1	STMicro	BD677	313-6944
C3-,C3+	100u 35v	2	Nippon-Chemi	EKMG350ELL101MF11D	374-556
LED	- +	1	RS Pro	790-1098	790-1098
DISCHARGE	Jumper	1	Harwin	M20-9990245	681-2972
D2-,D2+	2.4v	2	Nexperia	BZX79-C2V4,113	544-3503
D1-,D1+	6.2v	2	Vishay	BZT03C6V2-TR	295-5003
Q2+,Q3+	BC337	2	OnSemi	BC33725TA	671-1116
Q2-,Q3-	BC327	2	OnSemi	BC32740TA	671-1107

Parts available from [RS Online](#). Also try [Farnell](#), [Mouser](#) and other online suppliers. Parts from different manufacturers can be substituted where spec is sufficient. Supplier trading names may differ by country.