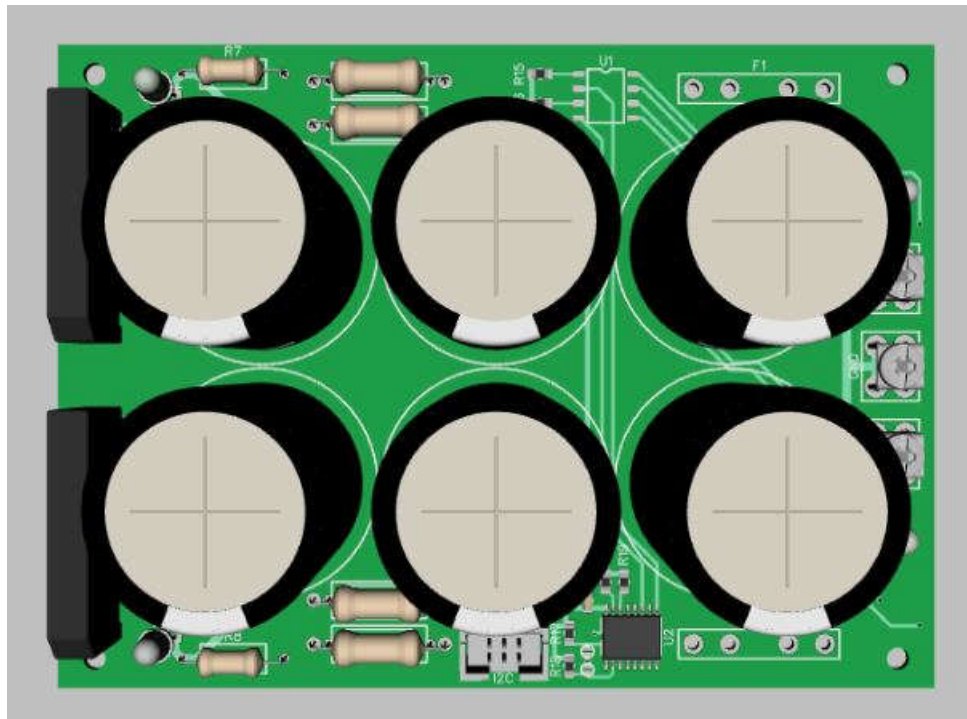




Modular Supply V1.0

Power supply building instructions



VIRTUAL ZERO distortion AUDIO

Version V1.0.1, June 2019



Tools required

There are a few different ways to solder parts to the boards. Reflow ovens or hot air rework stations make very easy fast work of SMD installation, but these instructions will focus on a standard soldering iron.

- Good temperature controlled solder station with a large screwdriver tip, and a fine point tip
- A second iron to aid removal of parts if required (quality not as important for the second iron)
- Good quality fine tip tweezers (cheap tweezers tend to launch more parts across the room)
- Magnifying glass or loupe
- Liquid or gel flux
- .015" flux core solder
- An accurate DMM
- The usual assorted hand tools such as screw drivers and pliers
- a working amp control board

BOM

Qty	RefDes	Name	Value	Mouser
	C1, C2, C3, C4,			
6*	C5, C6	Supply Cap		661-ESMH800VNN103MA5
1	C7	CAP_1206	.1uF	80-C1206C104K1R



1	C8	CAP_1206	10uF	810-C3216X7R1E106MST
2	D1, D4	GSIB2580-E3/45	Bridge Rectifier	625-GSIB2580-E3
4	D2, D3, D5, D6	AA3528AF3C	1206 LED	604-APTD3216LSURCK
2	F1, F2	FUSE 22.86 vz	22mm fuse holder	576-64600001003
2		Fuse Cover		576-64000001003
			Output terminal blocks	
3	J1, J4, J7	Keystone 7797		534-7797
4	J2, J3, J5, J6	Faston		571-624091
1	J8	I2C	75869-131LF	649-75869-131LF
2	Q1, Q2	MOSFETN_D	IPB025N-10N3 G	726-IPB025N10N3G
	R1, R3, R5, R6, R9, R10 R13,			
8	R14	RES700 3W	CRC	FMP100JR-52-0R47
4	R2, R4, R11, R12	RES_1206	LED	667-ERJ-8ENF1002V
2	R7, R8	RES700 3W	Bleeder	71-CPF110K000FKEE6
2	R15, R16	RES_1206	220R	667-ERJ-8ENF2200V
	R17, R18, R19,			
4	R20	RES_1206	10k	667-ERJ-8ENF1002V
1	U1	Mosfet Driver	ASSR-V622-302E	630-ASSR-V622-302E
1	U2	PCF8574T	PCF8574	595-PCF8574ADWR

Note 1 - C1 - C6 can be any 30 - 40mm diameter capacitor with 10mm or 22 mm lead spacing (be careful selecting United Chemicon caps)

Note 2 - CRC are optional and should match you desired CRC values if used. A simple jumper wire is recommended when using the supply with any of our amplifiers.

Note 3 - R8 & R9 are optional bleed down resistors. We recommend using them with any of our amplifiers to remove power from the supplies when shut down for your own safety, but if your amplifier has poor PSSR this may actually raise the hum level slightly. If you are building extremely high voltage supplies a 10K value may be a better choice to prevent overheating of the resistors.

Assembly

The supply board should be assembled in a clean well-lit area on a solid flat work surface. Any parts accidentally dropped or launched from the tweezers are much easier to find on a freshly swept hard smooth surface floor. Antistatic precautions should be observed when handling any semiconductors (Touch something grounded first. Don't wear wool or work over carpet).



SMT parts are different to work with than through hole parts, but are quick and easy to install. To install a component, first apply a small amount of solder on one pad. Next set the component in place with tweezers and hold it there. Reheat the pad with the solder on it until the component sinks into the solder. Once the solder cools (almost instantly normally), recheck alignment and adjust if necessary. If the part has multiple pins, solder one on the opposite side of the component and realign if necessary. Once the component is aligned and firmly attached, solder any remaining pads. With a bit of practice this becomes very fast and easy to do. Any solder bridging can easily be cleaned up with some solder wick or a solder sucker.

Begin by thoroughly washing the board with isopropyl alcohol, then applying a good liquid flux to all the pads. Clean pads and good flux are very important when dealing with SMT parts. They promote fast heat transfer which reduces chance of heat damage to the board and create a better weld between the part and the board.

Install parts working from small lower height parts such as resistors and capacitors, then work your way up to the taller pieces like electrolytic capacitors. Rectifier heat sinks can be fabricated from sheet metal scrap. The bridge rectifiers will produce a small amount of heat during initial power up but will run cold in normal operation.

If the large reservoir caps have been laying around for a while you may want to reform them prior to installation. This is easily done by applying a voltage (whatever you plan to run) to them through a high power (10W) resistor of a few k-ohm value (not a real critical value) for a few hours until the voltage at the cap reads close to the applied voltage.

Wash all the excess solder flux off the board with flux remover or isopropyl alcohol. Prior to installing the large reservoir caps the board can be submerged for cleaning if needed. Dish soap and water do a good job of cleaning but should be followed by a distilled water rinse and compressed air drying. Always allow lots of drying time before applying power for the first time.

Install appropriate sized fuses to match your build. If you are using more than one Modular Supply, you will need to solder an address selector jumper (J9 or J10) on one supply only.

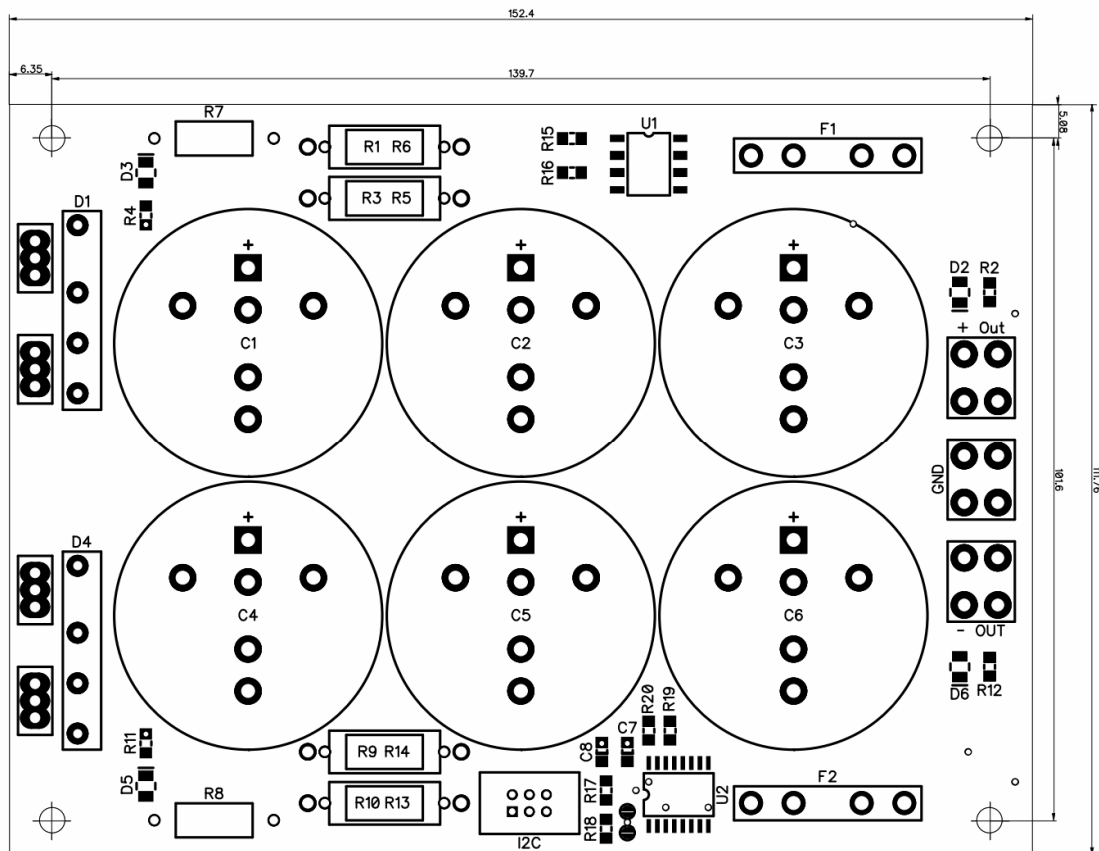
Initial Power Up and Testing

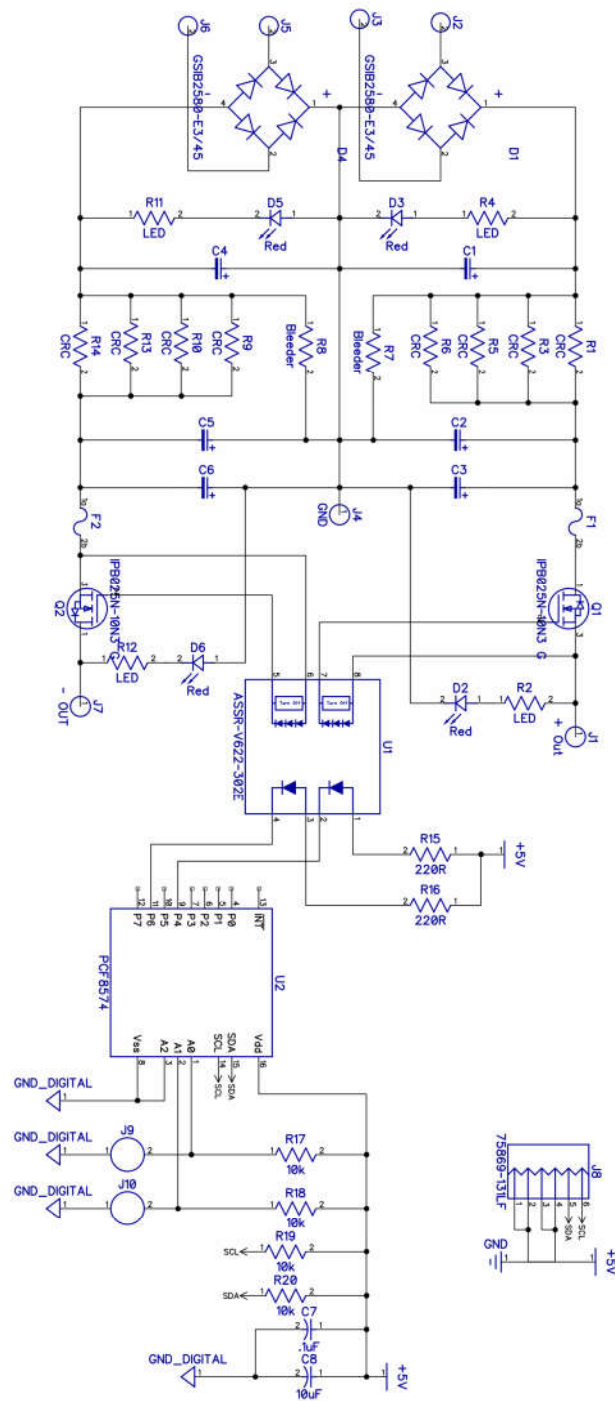
After a good visual inspection and testing for shorts with an ohm meter, connect the transformer. A bulb limiter can be put in series with the transformer primary windings if you are unsure of your work. On initial power up the bulb should light brightly, then dim down to nothing. Power LEDs should light and nothing should be warm. There should be voltage present

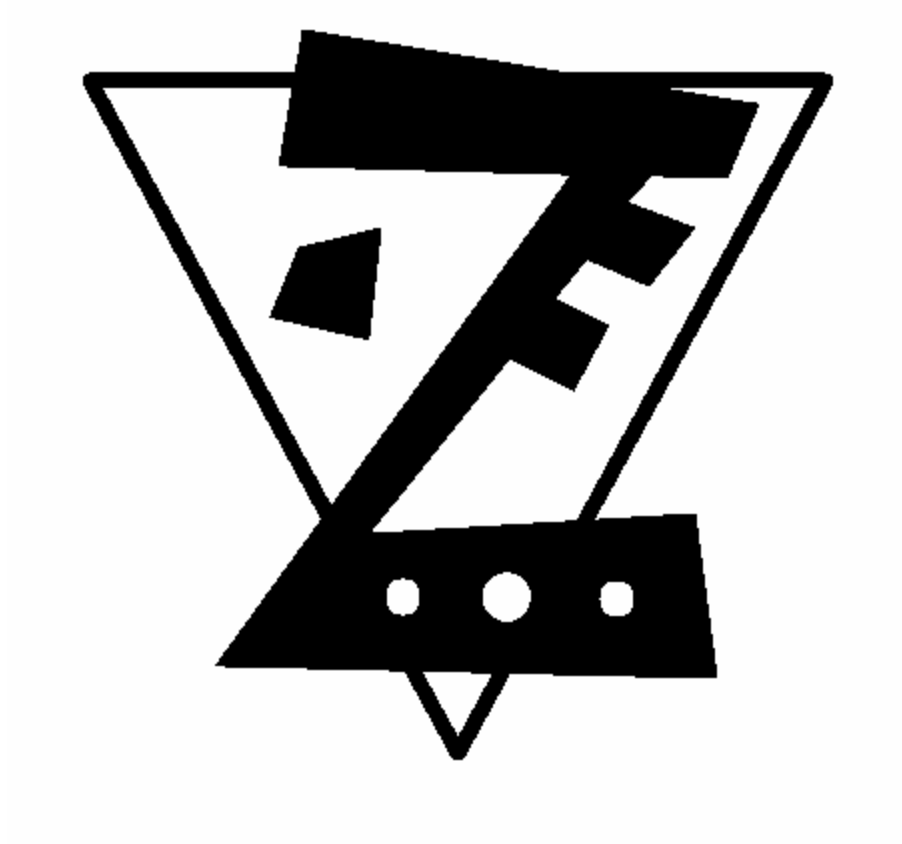


at the output terminals. On initial power up the port expander defaults to the power on condition until an amp control board tells it to do otherwise.

Power down the supply and connect an amp control board. Determine the address of the expander using the I2C Scanner software on the control board (see control board build guide). Apply power again and run the amp control board through a power up cycle, then a power down cycle. Now there should be no voltage present on the output connections. If all looks okay the power supply is ready to put into service.







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