

Softrock Lite II 01_Power Supply

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Power Supply Introduction

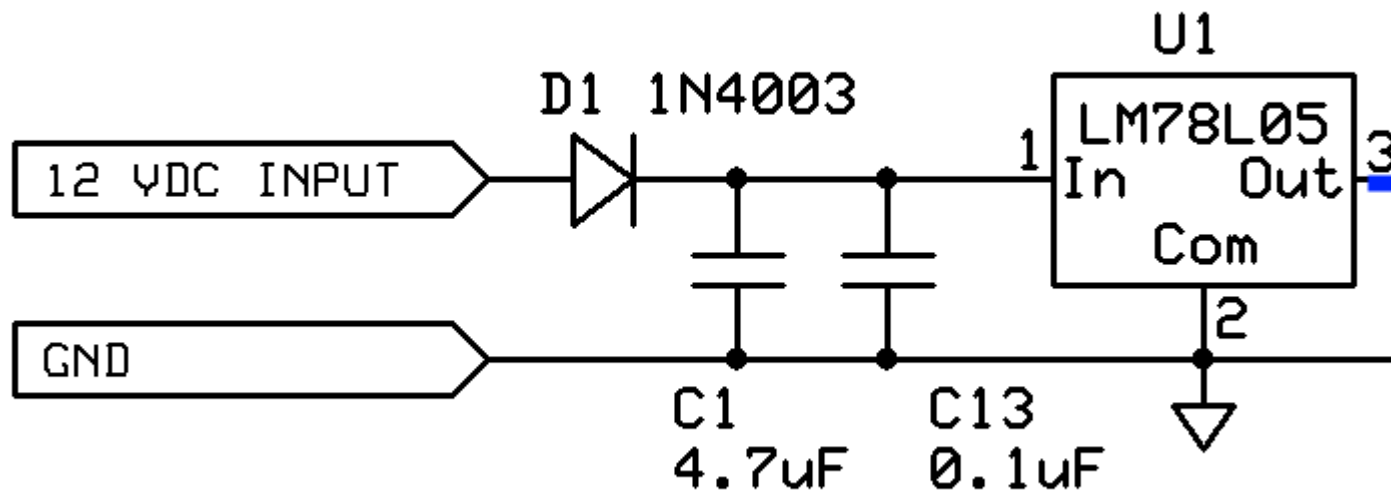
Theory of Operation

This stage provides the +5 volt power rail for the radio. The incoming voltage (from 9 - 12 Vdc) is regulated by U1 to a nominal 5 Vdc (4.5 - 5.1 Vdc range). D1 serves to protect the circuit from accidentally reversed polarity.

Power Supply Schematic

(Resistor testpoints (hairpin, top, or left-hand lead), as physically installed on the board, are marked in the schematic with red dots)

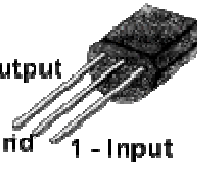
([Click for Full Schematic](#))



(above schematic has clickable areas that can be used for navigation)

Power Supply Bill of Materials

Detailed Bill of Materials

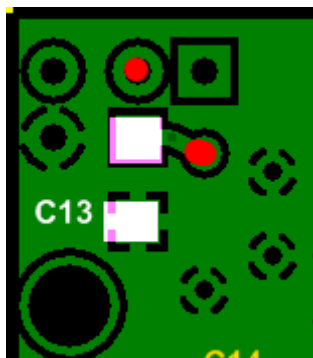
Check	Designation	Component	Marking	Category	Orientation	Notes	Circuit
☐	C01	4.7 uF 10%	475	Ceramic			Power Supply
☐	C02	4.7 uF 10%	475	Ceramic			Power Supply
☐	C13	0.1 uF	black stripe 	SMT 1206	SMT		Power Supply
☐	D1	1N4003	1N4003	Axial	E-W		Power Supply
☐	gnd	shunt wire (cut-off lead)		misc			Power Supply
☐	U1	LM78L05 voltage regulator	LM78L05 	TO-92			Power Supply

Power Supply Summary Build Notes

- Install SMT cap
- Install topside components
- Install ground test loop
- [Test the Stage](#)

Power Supply Detailed Build Notes

Bottom of the Board



Install SMT cap

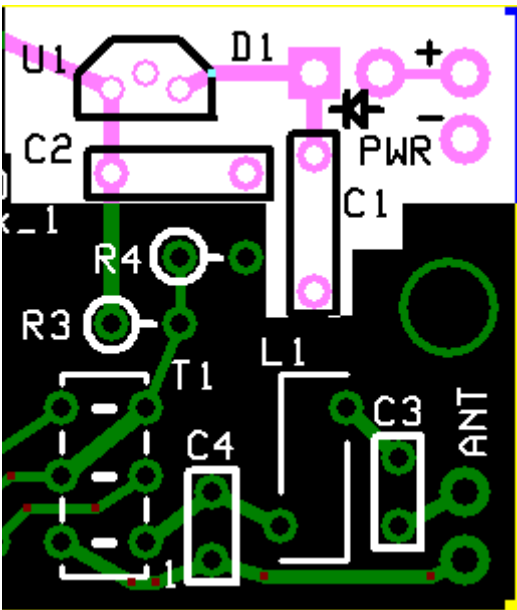
Install C13 SMT 0.1 uF cap

Take care to avoid solder "splashover" that could clog up the thru-holes above and to the right of C13 (see red dots in above graphic)

See [hints on installing SMT Caps.](#)

Check	Designation	Component	Marking	Category	Orientation	Notes
☐	C13	0.1 uF		SMT 1206	SMT	

Top of the Board



Install topside components

Install the two blue capacitors, U1, and D1. Install D1 such that the cathode end (the end with the band) is facing up and forms a hairpin. The hairpin lead will go into the square thru-hole (refer to the Completed Stage, Topside picture below).

See [hints on identifying and installing Ceramic Capacitors](#)

Check	Designation	Component	Marking	Category	Orientation	Notes
☐	U1	LM78L05 voltage regulator	LM78L05	TO-92		Take ESD precautions

						
☐	D1	1N4003	1N4003	Axial	E-W	
☐	C01	4.7 uF 10%	475	Ceramic		
☐	C02	4.7 uF 10%	475	Ceramic		

Install ground test loop

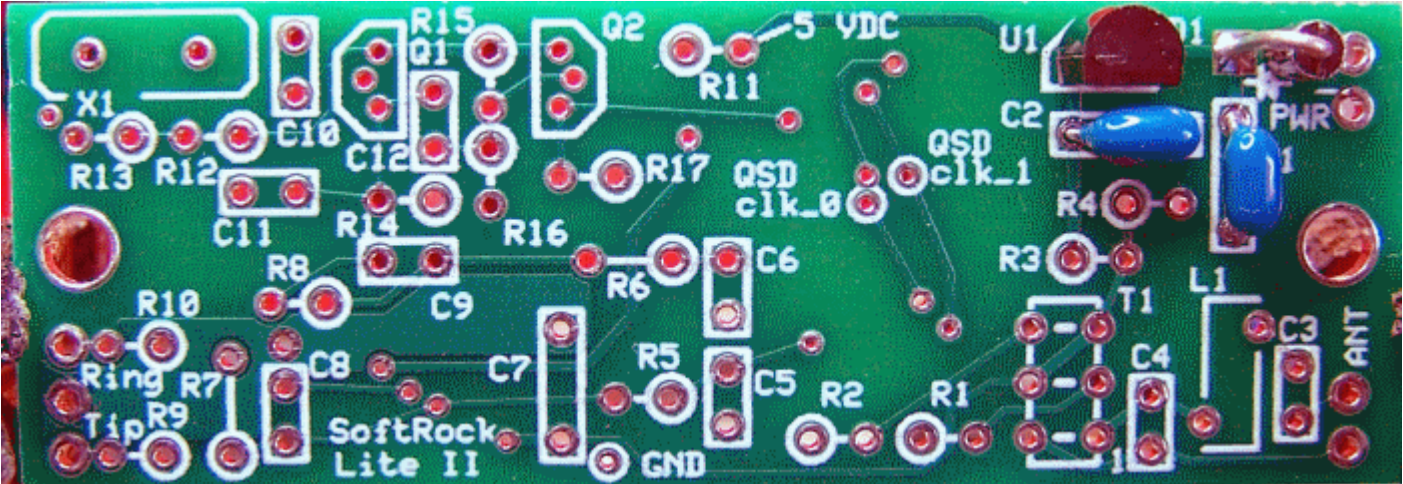
Using a short length of cut-off resistor or capacitor lead, fashion a short wire loop and solder it to the "ground" hole, such that the loop is available on the topside to provide a ground point for tests.



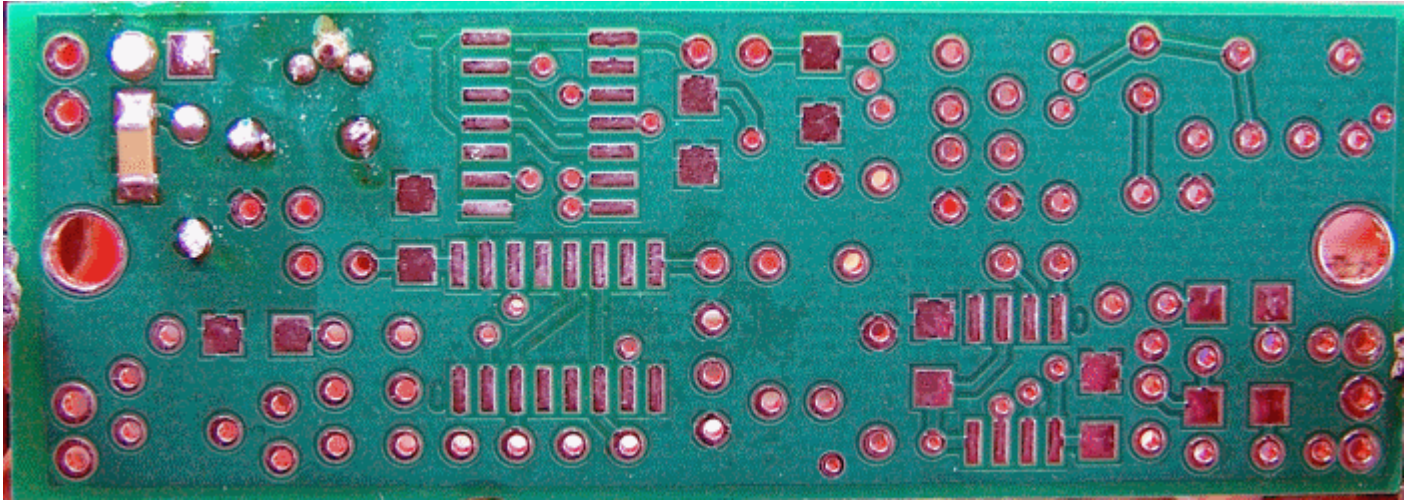
Check	Designation	Component	Marking	Category	Orientation	Notes
☐	gnd	shunt wire (cut-off lead)		misc		

Power Supply Completed Stage

Top of the Board



Bottom of the Board



Power Supply Testing

Visual Inspection

Test Setup

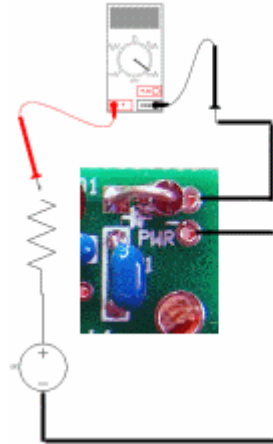
Using very good lighting and magnification, carefully inspect the solder joints to identify bridges, cold joints, or poor contacts.

Current Test

Test Setup

Test for current draw in 2 ways:

- Use a 12 volt power supply
- In one test there is also a 1k resistor in the series "chain" as well.
- in the second test, the setup is the same except that the current-limiting resistor is removed



(measurements courtesy of Leonard KC0WOX)



Test Measurements

Testpoint	Units	Nominal Value	Author's	Yours
With limiting resistor	mA	< 12	4.1	
Without limiting resistor	mA	3 - 6	4.4	

Voltage Test

Test Setup

Once the current draw test is successfully passed:

- Apply 12 Vdc (NO current limiting resistor) to the PWR + and - pads (upper right-hand corner of the board)
- Measure the voltage with respect to ground at the testpoints below



Test Measurements

Testpoint	Units	Nominal Value	Author's	Yours
R11 hairpin (5 Vdc point)	Vdc	5	4.93	
D1 cathode (square hole)	Vdc	11-13	12.2	