

Roku SoundBridge Radio Power Supply Replacement Instructions

The following instructions describe how to replace the power supply in the Roku SoundBridge Radio. The factory-supplied Roku power supply is likely to fail within 1-2 years of purchase due to heat build up and components not rated for operation at high temperature.

The three repair options are to:

1. send the unit back to Roku for repair
2. replace the fried components with new parts rated for high temperature
3. replace the power supply with an external plug-pack

Option 1 is probably too expensive if you are out of warranty, plus Roku doesn't appear to be very interested in providing this service. Furthermore it doesn't solve the problem as the replacement unit will probably fail again within 1-2 years.

Option 2 (in my case replacing a fried capacitor) kept it running for another year until several other components failed.

Option 3 should provide a permanent solution. Using a 13V plug-pack and a small on-board regulator to step-down to 9.8V, it's working nicely and the power supply/speaker casing is significantly cooler with the Roku-provided power supply removed.

PARTS

Parts:

- LM317T voltage regulator
- T-220 heatsink and mounting kit: heat sink, mounting bolt, mica washer, and heatsink paste
- 1.5k-ohm resistor
- 220-ohm resistor
- 1.0uF Capacitor (e.g. Tantalum 35V)
- 0.1uF Capacitor (e.g. Ceramic disk 50V)
- Small PCB used to assemble components
- Panel-Mount Coaxial DC Power Jack (e.g. Radio Shack Part 274-1576)
- 13V 2Amp Power pack (15V would also be fine)

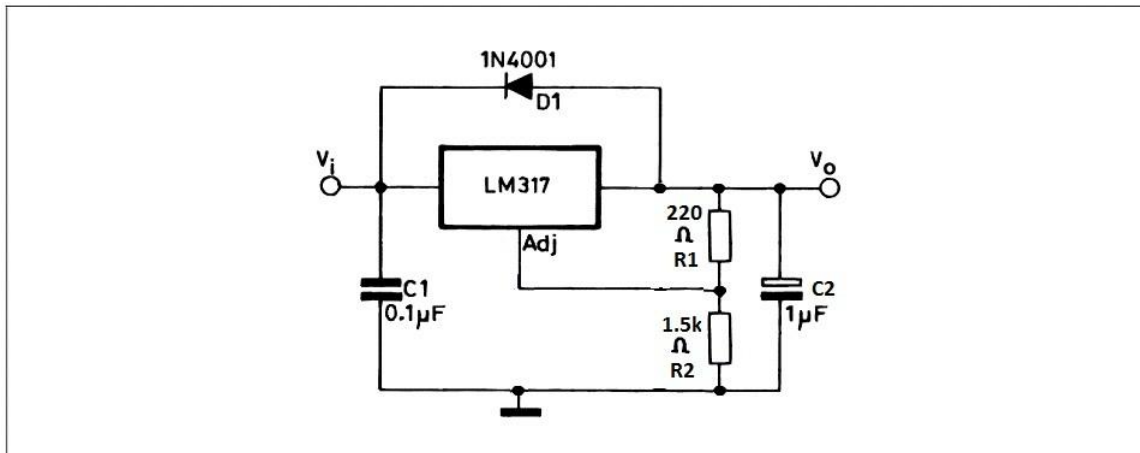
The power jack will depend on the plug size of your 13V plug-pack. Radio Shack part 274-1576 supports 5.5mm O.D. x 2.5mm I.D. plugs which are somewhat common.

These parts will cost around US\$20 from Radio Shack.

Other supplies:

- Flat-blade screwdriver - 3mm (or around 7/64") - to remove the Roku power supply unit
- Philips-head screwdriver
- Cutting knife to open the power supply unit
- Wire, solder, soldering iron, cutters
- Drill and drill bit (7/16" or 11mm for the power plug listed opposite)
- Insulation Tape and/or glue to mount the PCB
- Heat shrink insulating tubing (optional)

LM317 Reference Circuit

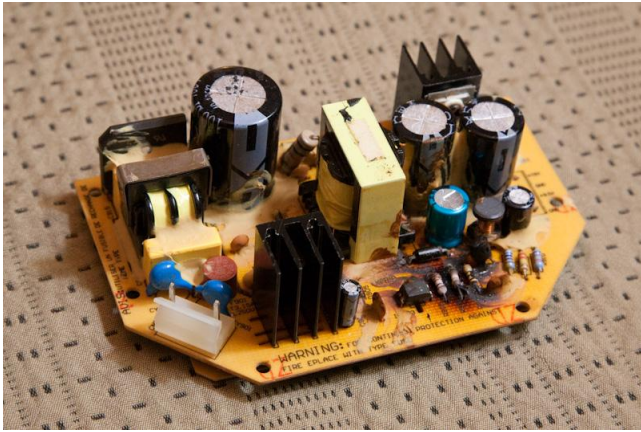


Note: D1 protect the device against input short circuit

The 220/1.5k-ohm resistors will generate a 9.8V output.

The input protection diode D1 is optional and it provides a small amount of extra protection for the LM317 (against input short circuit). It is possible to add further diode protection against output shorts, but that is not required in this application.

Opening the Roku Power Supply



The Roku SoundBridge Radio power supply unit needs considerable effort to get open.

- You might not need to buy a star-driver to open the 4 security screws on the back. Instead wedge a 3mm flat-blade driver in each screw head.
- Then unplug the power and audio connectors and separate the power supply from the main unit.
- Unscrew all the screws.
- Carefully use a cutting tool to cut through the seams holding the back onto the casing. It will take some patience.
- Do all of this over a cloth or sheet of paper as the black sealing compound is messy.

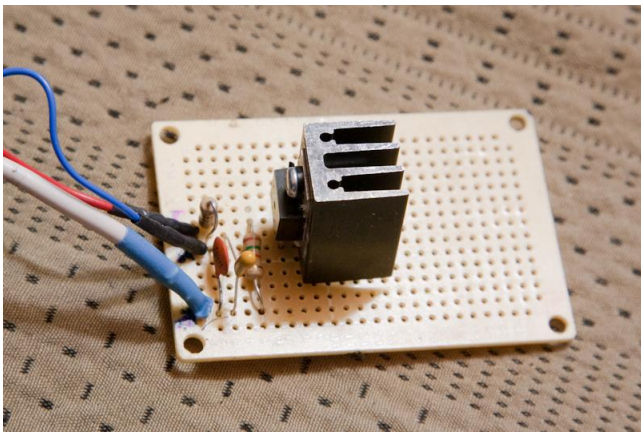
When you remove the old power supply, make a note of what power cables are connected where. On my unit:

- Blue - 19V
- Red - 9.5V
- 2x Black - ground
- White - ground

The wire colors might be different in your Roku power supply

The photo to the left shows the burnt out Roku Power Supply. A number of components in the front-right were burnt out during the second failure. The blue electrolytic capacitor on the right was the capacitor replaced after the first melt-down. (I used a component rated to 130C – as you can see it survived the 2nd meltdown.)

New Plug-pack design



9.8V regulator PCB

- At 13V input the LM317 case temperature is ~60°C.
- At 18V input the LM317 case temperature is ~90°C.

Although 90°C is within spec it is somewhat high in an unventilated space, and I would only consider doing this using a larger heat sink than the one shown in the photo on the left.

There seemed to be no reduction in the SoundBridge sound volume when driving the amplifier with 13V. (The factory-built power supply provided 18V to the amplifier.)

A 15V input supply should also be fine; presumably the LM317 casing would sit around 75°C which should be okay.

Note: The polarity of the Tantalum capacitor matters.



I placed the DC power jack next to the power socket.

You will probably need to use a chisel to shave off some of the plastic molding inside the case to get a good fit.

Keep the jack away from the bottom of the unit otherwise you won't be able to fit the locking nut inside.

Solder the wires to the jack before mounting in the case - there is not enough room to do this once the jack is in place.



Wiring up:

I cut off the wires from the old power socket (bottom-right in this photo.) You could seal the contacts, however, there is nothing they can touch. You could also fill in the external socket with sealing compound to make it clear it's no longer in use.

- The Roku amplifier supply (blue wire) connects directly to the 13V input supply.
- The Roku system supply (red wire) connects to the 9.8V regulated output
- The Roku ground wires (black and white) connect to the power supply ground rail.

I re-used the input choke on the 13V input supply shown - here in the photo top-right.



For testing purposes I used a variable voltage power pack.

- A fixed voltage 13V supply would be perfect. 15V should also be fine.
- A 12V supply works, although it is somewhat too close to the 9.8V regulated output. (I admit to not having done any testing to find out to what extent this would limit current.)

Make sure the plug size matches the DC power jack you purchased.

Also double-check the polarity before plugging in. Positive center pin is usual but not guaranteed.