

Linear Audio SilentSwitcher (var) output voltage setting.

Introduction.

The variable version of the SilentSwitcher is delivered with 'analog' output voltages preset to +/- 15V. It is possible to customize these output voltages by soldering a quartet of 4 SMD resistors on the board. These resistors are size 1206 so large enough to solder even if you have no experience with SMD. This document gives the resistor values for output voltages of +/-12V, +/-8V and +/-5V, and a guide to the customization.

Intermediate output values are possible; please contact me.

Note that the two output voltages need not be the same – you can have any combination like +12V and -5V.

Resistors.

Table 1 give the values of the resistors for the various output voltages. These should be SMD thin film resistors, size 1206. The values shown are normally in stock with the usual suspects like Mouser and Digikey. Values are in k-Ohm!

	<u>Pos.</u>	<u>Neg.</u>	<u>Pos.</u>	<u>Neg.</u>
<u>Vout</u>	RX1	RX2	RX3	RX4
5	34.8	44.2	17.4	22.6
8	78.7	95.3	45.3	57.6
12	267.0	300	169	210

Table 1 – custom resistor values

To avoid errors as much as possible I recommend that you solder one resistor at the time and check for correct voltage after each soldering, as described below.

Soldering.

The 1206 SMD resistors are huge as SMD goes and you should have no problem soldering them correctly and cleanly with no shorts. Make sure you have a clean iron with a narrow point. There are no specific requirements for the solder, use good quality with resin and not too thick; 0.5mm (0.02") works OK. There are many ways to do it; the way I do it is as follows. Wet one of the pads *with very little solder*. Take the word 'wet' literally! Then I place the part on the pads with a tweezer, taking care to hold it flat and down, and about midway on the pad pattern so you have some pad left on the other side to solder. This needs some exercise and a steady hand. Then bring the iron to where the previously wetted pad and the part meet so the solder connects. Verify that the part is reasonably flat on the board, if not press on the part while wetting again the just soldered pad and the part should snap into place. Solder the other pad, and add a bit of solder to the first pad if needed. That's all there is to it.

There's a nice illustration here doing it largely the same way:

<https://www.build-electronic-circuits.com/smd-soldering/>

Procedure.

Use the following Figure 1 to identify the location of each resistor as well as the various test points. DO NOT proceed to the next step until the current step is completed and delivers the correct test voltage!

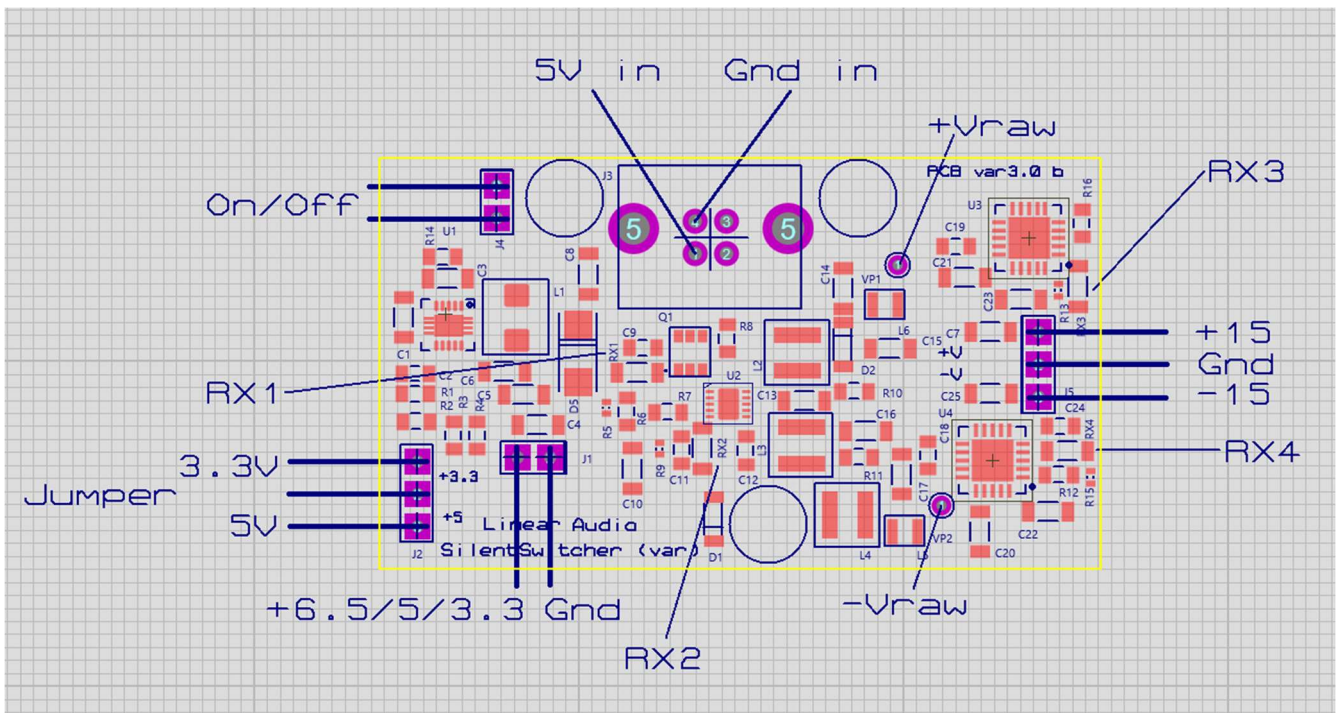


Figure 1 – resistor locations and test points

1. Locate and solder RX1. Switch the unit on and check the DC voltage at +Vraw. It should be between 0.5 and 1V more positive than the required +Vout. Switch the unit off.
2. Locate and solder RX2. Switch the unit on and check the DC voltage at -Vraw. It should be between 0.5 and 1V more negative than the required -Vout. Switch the unit off.
3. Locate and solder RX3. Switch the unit on and check the DC voltage at +Vout. It should be within a few 100 mV of the required +Vout. Switch the unit off.
4. Locate and solder RX4. Switch the unit on and check the DC voltage at -Vout. It should be within a few 100 mV of the required -Vout. Switch the unit off.

Appendix – maximum load currents.

Table 2 gives the maximum continuous load currents for each output value for safe operation. The current can be drawn continuously from each polarity, both polarities at the same time.

Output volt. (+/-)	Max load (cont) (mA)
5	380
8	250
12	170
15	150

Table 2 – continuous maximum current draw, per polarity.

Note that if you mount the SilentSwitcher inside an enclosure that sees appreciable temperature rise, the unit could go into temperature protection at prolonged high load currents.