BalancedReceiver r2 – mounting instructions

INA134 Balanced Receiver with OPA2134 input buffer and 2 buffered outputs with independent volume control. Can be supplied directly from a dual power amp rail supply between 18-60V. These features make it the perfect input section for single channel power amplifier or bi-amping (two channels). The input buffers give outstanding performance (THD+N < 0.001% @ 0DB gain) even for input cables of significant length or uneven impedances.

List of components

Qty	Value	Device	Parts
1	BC550C	BJT	Q1
1	BC560C	BJT	Q2
2	22u	C-elec-2.5-6	C1, C2
2	100u/35	C-elec-2.5-6	C7, C8
2	47u/63V	C-elec-3.5-8	C5, C6
6	100n	C-multi	C3, C4, C9, C10, C11, C12
3	2-pin	Con-kk	IN, OUT1, OUT2
2	11V	D-zener	D1, D2
1	3-pin	DG300-5-3	SUPPLY
1	INA134P	DIP-8+socket	IC1
2	OPA2134P	DIP-8+socket	IC2, IC3
4	1k5	R-0207	R2, R3, R6, R7
1	2M2	R-0207	R11
2	470	R-0207	R4, R5
2	47k	R-0207	R1, R10
2	10k	R-trimpot	R8, R9

- For an inverted output signal you can simply exchange the connections between IN1 and IN2
- Set R8, R9 to about 5kOhm for 0dB gain

Testing

- Do not connect the INA134, OPA2134 and input/output signals yet
- Double check that all components are mounted correctly before connecting the supply
- Connect a bench supply to SUPPLY and increase the voltage to 20V
- Check the voltage of IC1 pin7 is about 10V and pin4 is about -10V. Same for IC2, IC3 pin 8 and 4.
- Further increase the supply voltage and check that the IC voltages remain about the same
- Remove the bench supply, connect the ICs, reconnect the bench supply and check the current consumption (about 20-30mA)
- Using a signal source and scope you can check the outputs and adjust the gain using R8/R9 if needed.
- Your BalancedReceiver is now ready to be integrated in your project!

Introduction

Thanks for buying this pcb or kit! Now the fun of mounting starts. Make sure you read the complete instructions before you start mounting. Assembling can be done by an experienced hobbyist in less than one hour.

Features

- Dual supply between 18-60V, so the circuit can be supplied directly from the poweramp rail supply
- Input buffers with OPA2134 to drive the differential receiver with low even impedance
- INA134 differential receiver
- 2 buffered outputs with independent volume control, this way the channels of a power amplifier can be easily matched. Allows bi-amping with independent volume control
- Outstanding performance
  - THD+N < 0.001% (1kHz, 0dB gain)
  - THD < 0.00025% (1kHz, 0dB gain)
  - THD < 0.001% (5kHz, 0dB gain)

List of components

Please check if the list of components is complete. If desired, you can adapt them to your needs.

Tools

Required:

- ✔ Soldering iron and solder
- ✔ Multi-meter (voltage and resistance)
- ✔ Side-cutting pliers

Recommended:

- ✔ Adjustable dual power supply
- ✔ Signal source
- ✔ Oscilloscope

General instructions

Mounting

The easiest way of mounting is by starting with the components with the lowest height and build up the PCB in steps, where components of the same height are fitted and soldered in each step. So, solder in this order: resistors, zenerdiodes, multilayer capacitors, connectors, transistors, DIP, electrolytic capacitors.

Always double check all components before you solder them (especially the ones that are polarity dependent, diodes, electrolytic capacitors, etc), as it is difficult to remove them after soldering, much more time consuming and may break components or PCB.
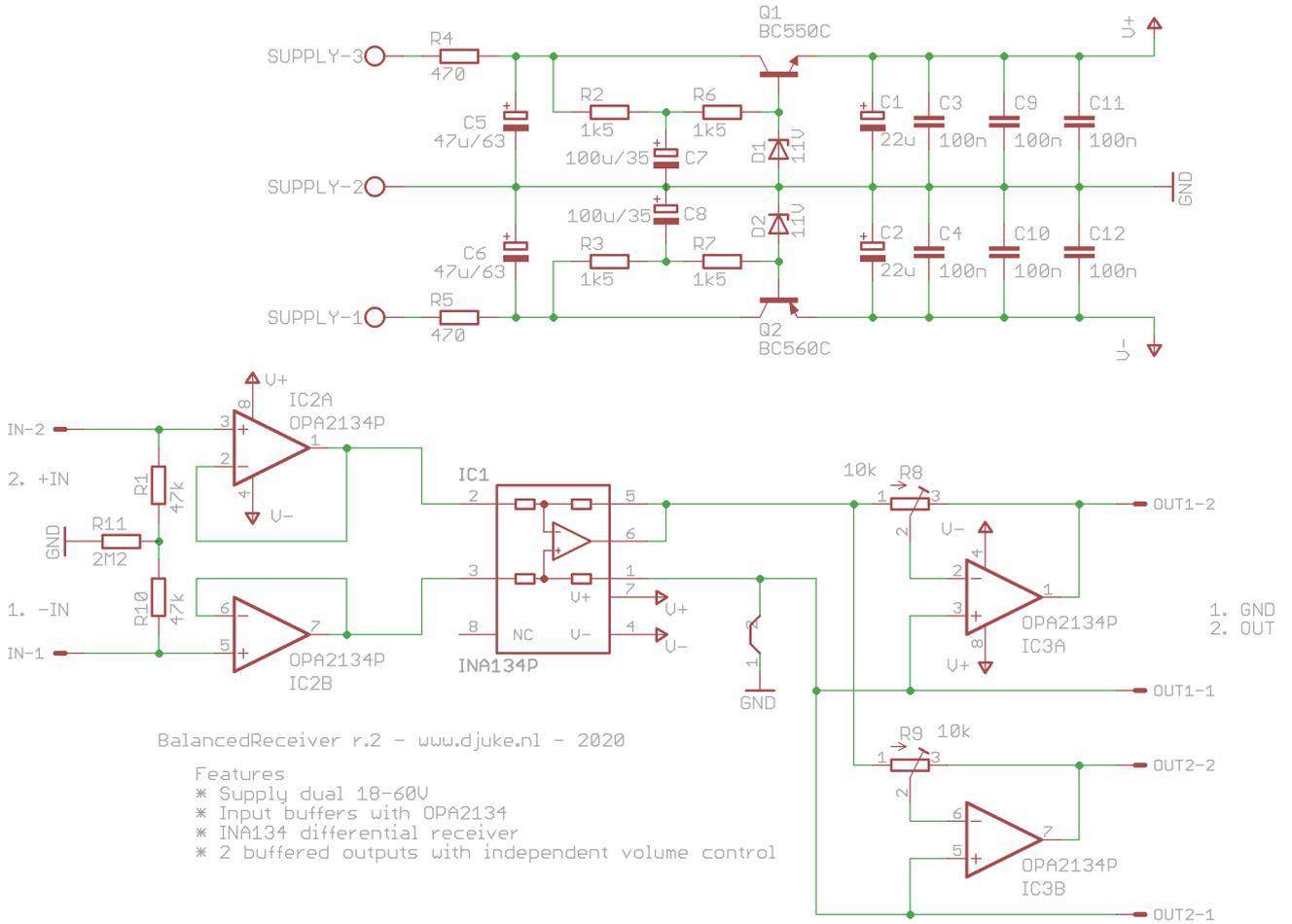
Connections

- Maximum supply voltage is about 60V. For higher voltage, R4/R5 and C5/C6 value, voltage and power rating have to be increased.
- Minimum supply voltage is about 18V. For lower voltage, R4/R5 may be decreased or replaced with a wire bridge.
- With a balanced input, connect the hot wire to IN1 and cold wire to IN2, the ground wire needs to be connected to the chassis.
- With a single-ended input, connect the signal wire to IN1 and the gnd wire to IN2.

Schematic

BalancedReceiver r.2 — www.djuke.nl — 2020

Features
* Supply dual 18–60V
* Input buffers with OPA2134
* INA134 differential receiver
* 2 buffered outputs with independent volume control