

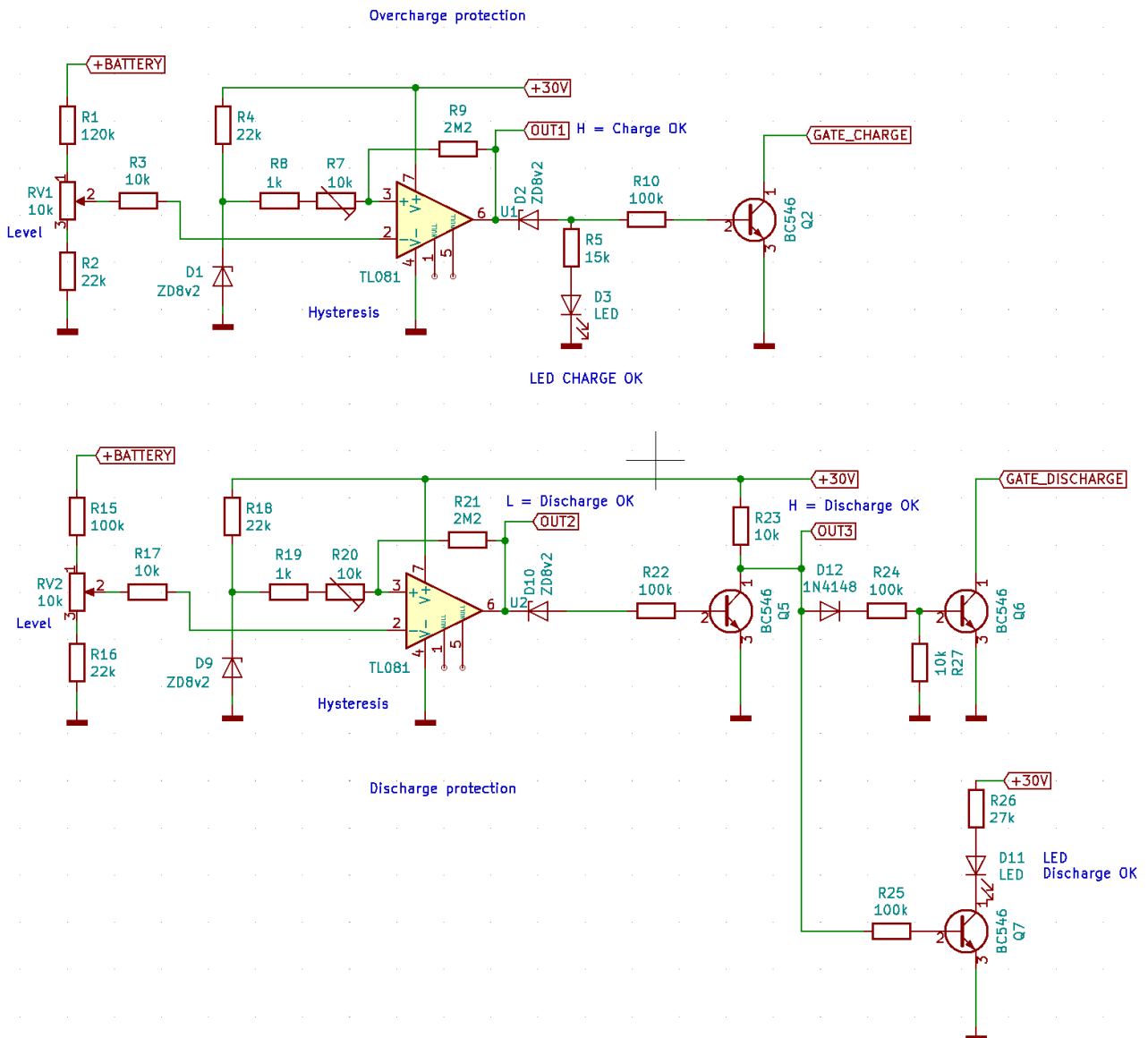
# Lilon battery protection

This circuit should protect my 48V solar battery from overcharge and from undervoltage due to too much discharge. A battery management of the separate cells is not included.

A purely analog circuit seemed more reliable to me than a controller that can get stuck. The analog circuit may fail due to noise and glitches, but after that it will resume its normal operation.

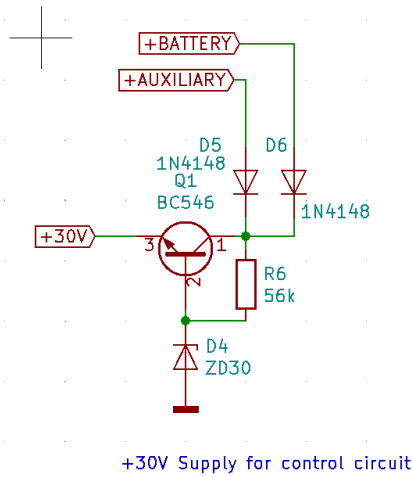
## Control circuit

There are 2 Schmitt triggers with adjustable level and hysteresis. As the circuit is powered with positive voltage only, a non inverting Schmitt trigger is needed for both circuits. The output of the second one is than inverted by transistor. Two LEDs show the activity.



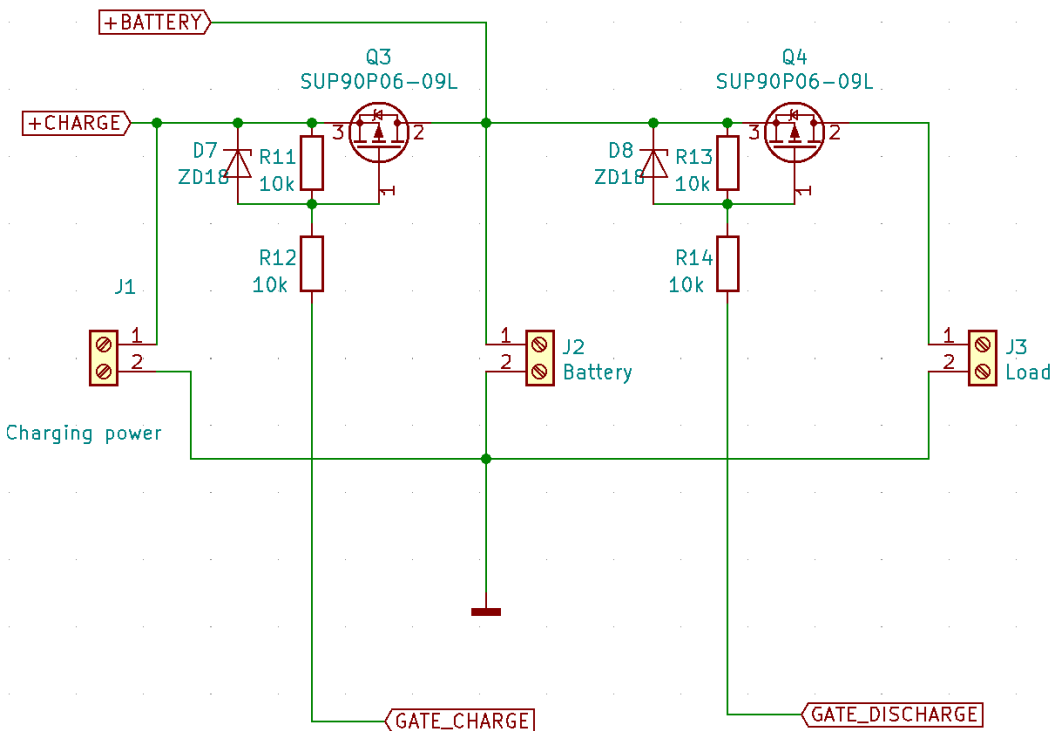
## Control circuit power

For 48V and eventually more we cannot use a 7805 or alike. So the +30V power is generated by zdiode and emitter follower.



+30V Supply for control circuit

## Power circuit



Two PMOS FETs with very low on resistance are used. There is a gate voltage protection by zdiodes. The transistors are switched on by pulling the gate pins low.