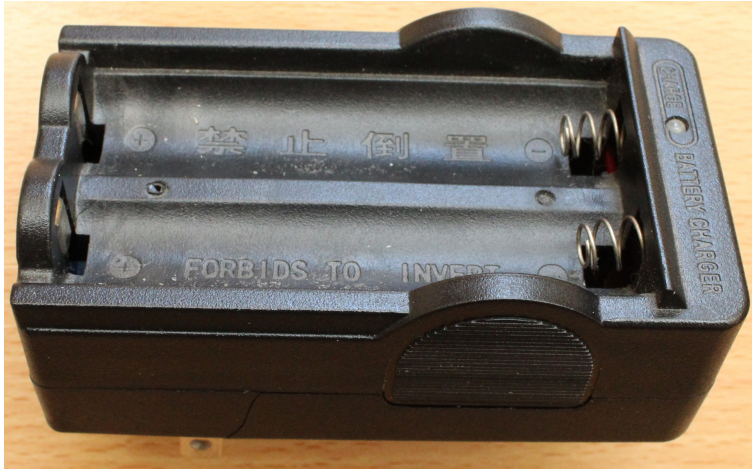


Battery Charger

A lot of 18650 3.7V batteries became unable to be charged by using regular battery chargers I own. The reason is still unknown. I guess that some trick must be implemented in both the 18650 battery and its charger, probably as one of features.



AC 110V charger with red/blue charge level display

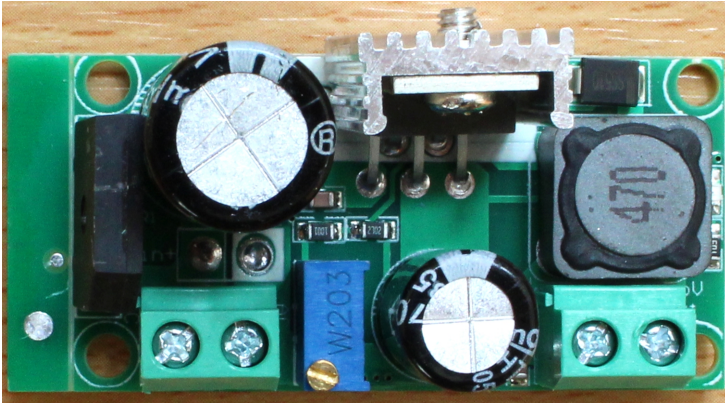


USB charger with four charge levels display

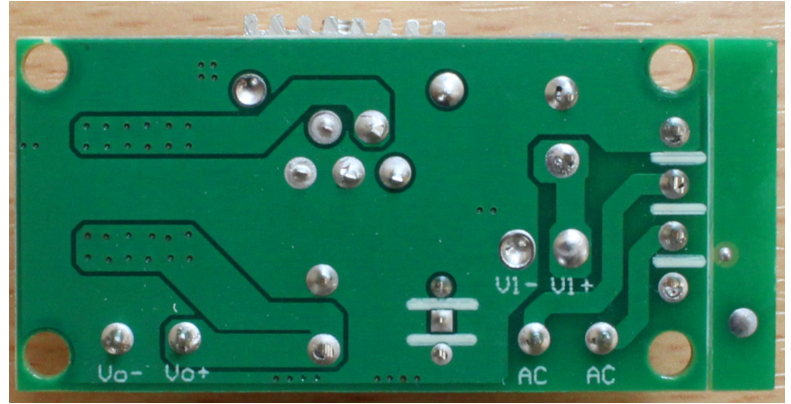
I made my own battery charger system and got successful result. All the half dead (?) 18650 batteries have been resurrected eventually.

These regular battery chargers started charging half dead batteries resurrected same as living batteries.

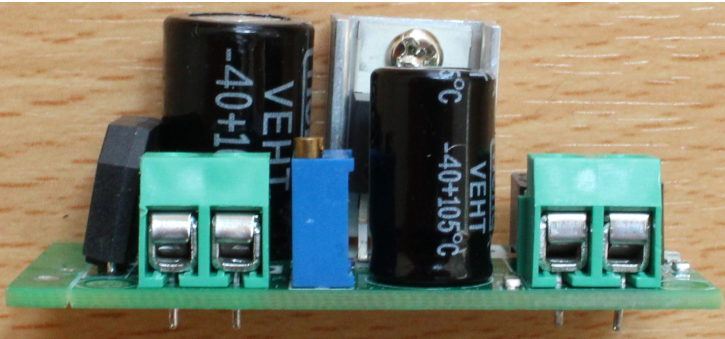
DC-DC Converter



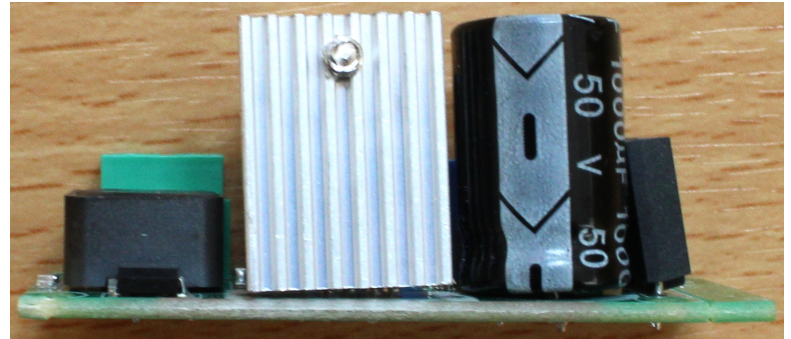
Parts side



Soldering side



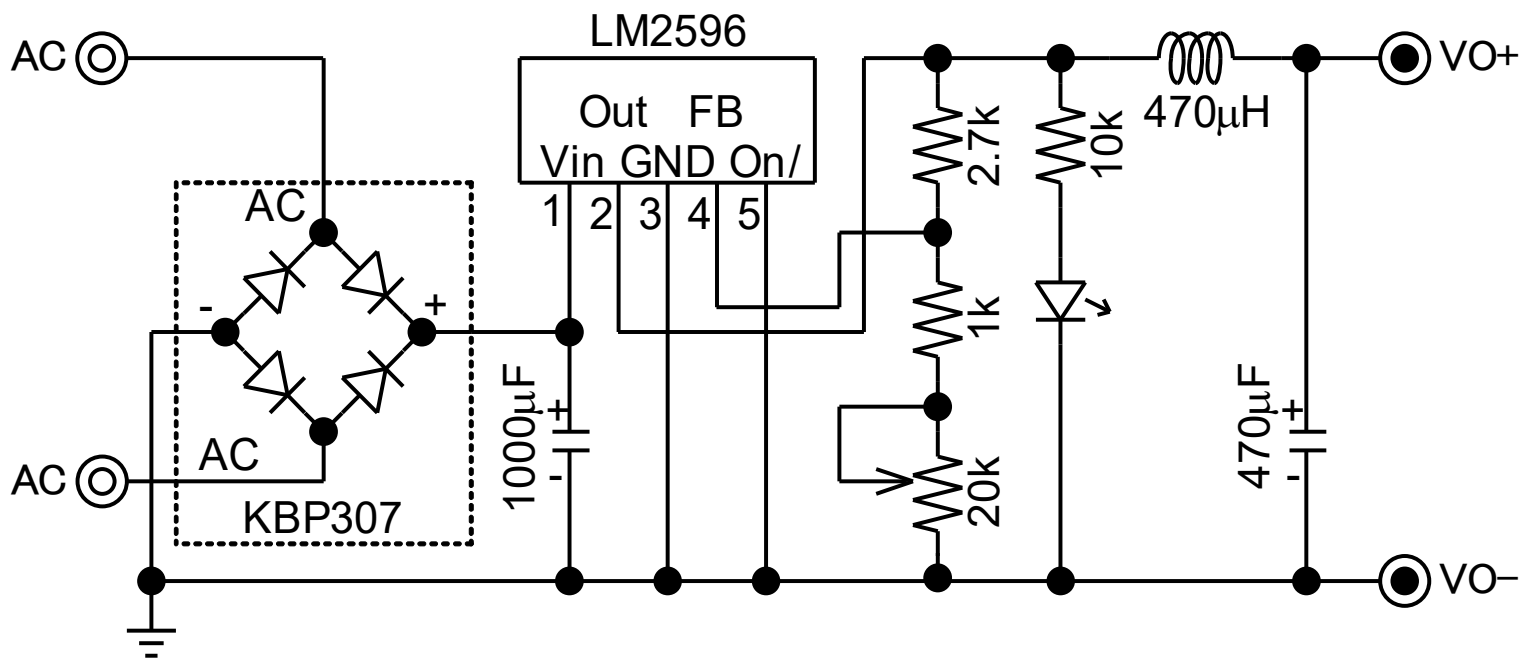
Side 1



Side 2

Refer to a datasheet of key components;

- (1) [LM2596](#), 40V 3A Step-Down Switching Regulator.
- (2) [KBP307](#), Full Wave Bridge Rectifier.

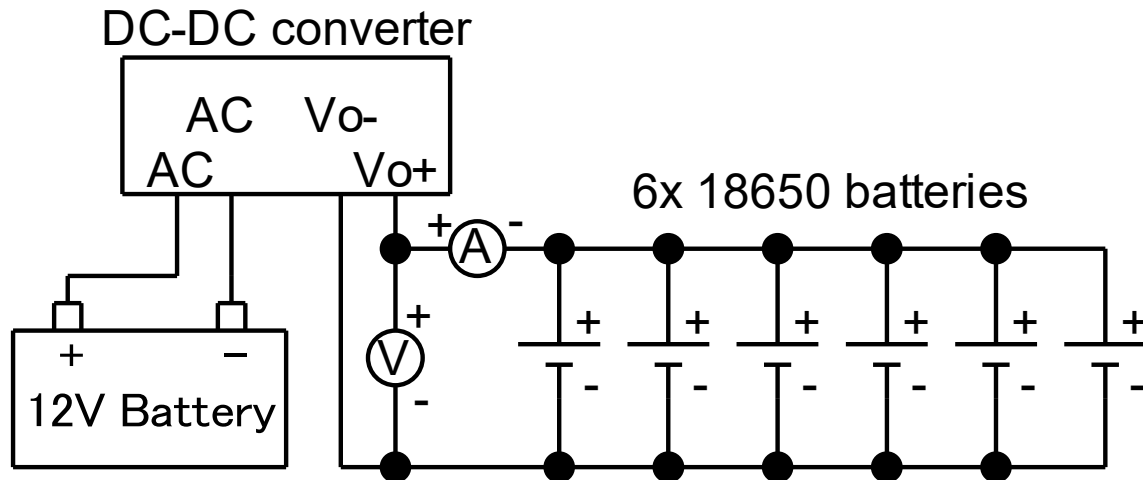


DC-DC Converter Schematic

Actual Charging System

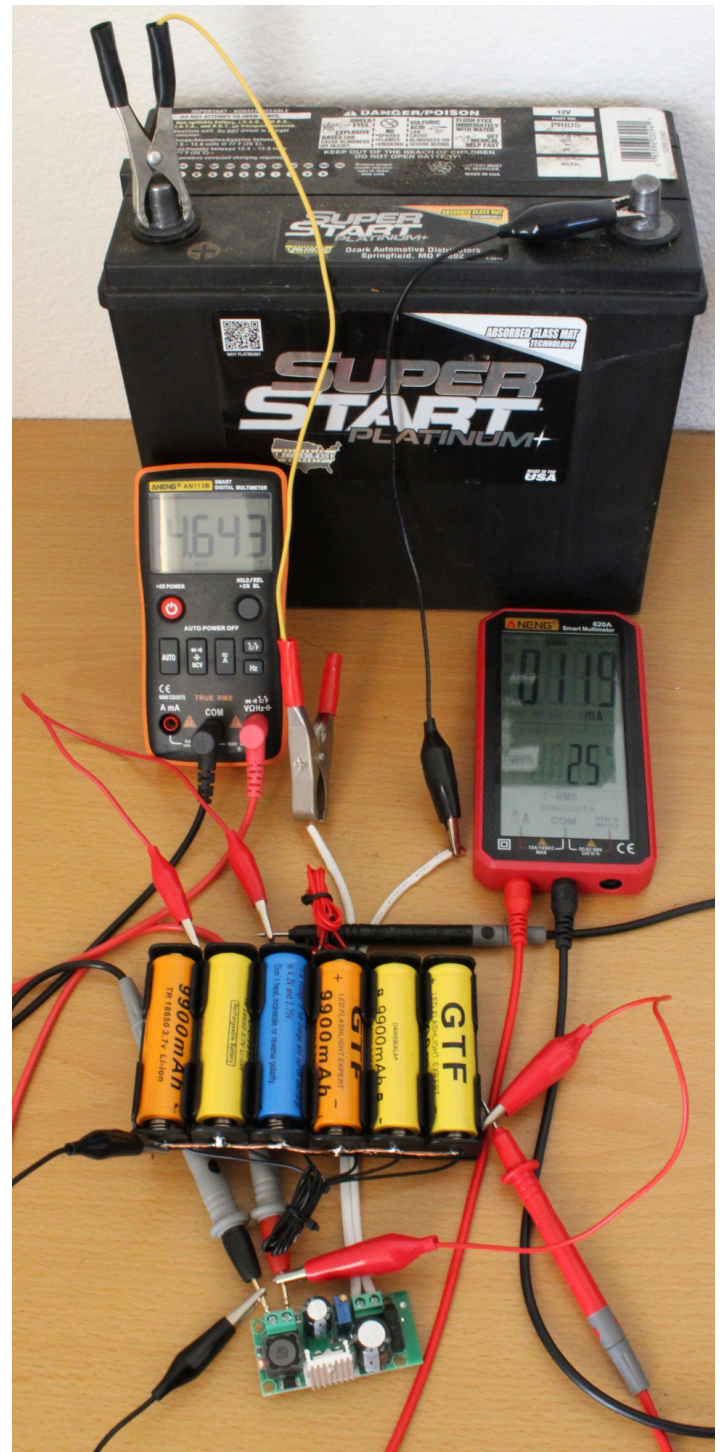
Because a full wave rectifier is implemented on this DC-DC converter, both DC and AC input voltage can be connected to input terminals named "AC".

When DC voltage is connected to "AC" input terminals, the output voltage of the rectifier drops around 1.3V from input voltage due to passing diodes (for example, 12V DC input becomes 10.7V DC output after passing through the rectifier). This is negligible. Even in case of AC input, the output of rectifier is averaged to make it DC and the DC output voltage is lower than the AC voltage as usual.





Charging one 18650 battery for initial stage of evaluation



Charging six 18650 batteries which are in parallel

Providing 4.62V for 3 hours charges batteries in full.

When charging 12V automobile battery, the charger provides 15V. The proportional calculation results in 4.62V.

In common sense, the charging battery storing electrons is performed slowly and takes time. Don't be fooled. Be patient and wait.