Notes

1. Resistor divider determines shut-off voltage for LT3652 (low-light conditions). VIN_reg should be higher than 2.7 V under normal operating conditions. VIN(min) in this 12 V system equals 8.64 V.

Eq 1. RIN1/RIN2 = (VIN(min) / 2.7) − 1

2. Output float voltage for battery charging. Resistor divider is used to set the required float voltage.

Eq 2. RFB2/RFB1 = 3.3 / (VBAT(flt) − 3.3)
E.g:
RFB2/RFB1 = 3.3 / (4.0 − 3.3) = 4.7
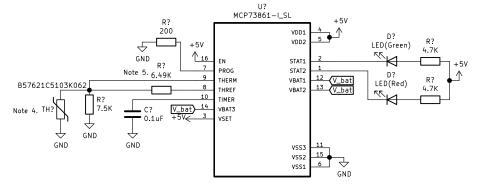———
RFB2 = 3.3 / 10 uA = 330K
———
RFB1 = 330K / 4.7 = 70K
———
Divider Equivalent Resistance = (330 x 70) / (330+70) = 57.75K
RFB3 = 250K − 57.75K = 192.25K (191K)

3. Max charge current can be set. This version uses 1000 mA.
Eq 3. RSense = 0.1 / ICHG(max)

4. Thermistor characteristics equals 10K at 25 degrees Celsius.

5. Thermistor shut-off charge conditions equal −10 and +60 degrees Celsius.
Eq 3. RT1 = (2 x Rcold x Rhot) / (Rcold − Rhot)
Eq 4. RT2 = (2 x Rcold x Rhot) / (Rcold − 3 x Rhot)

Datasheets

1. LT3652 − https://www.analog.com/media/en/technical-documentation/data-sheets/3652fe.pdf
2. MCP73861 − https://ww1.microchip.com/downloads/en/DeviceDoc/21893F.pdf
3. B57621C5 − https://www.tdk-electronics.tdk.com/inf/50/db/ntc/NTC_SMD_Standard_series_1206.pdf