Phong Pham

ENGR460

Stepping Stone

Application Notes

4/13/20

2.5W 5V/500mA Solar Panel

Acquired

A cheap 2.5W solar array

1N4007-TP Diode

<https://www.digikey.com/product-detail/en/micro-commercial-co/1N4007-TP/1N4007-TPMSCT-ND/773694>

<https://www.mccsemi.com/pdf/Products/1N4001-1N4007(DO-41).pdf>

High voltage, high current rated diode. Reverse voltage protection with rating of 1000V. Will prevent large

LM3658SD/NOPB Battery Charger

<https://www.digikey.com/product-detail/en/texas-instruments/LM3658SD-NOPB/LM3658SD-NOPBCT-ND/808013>

<http://www.ti.com/lit/ds/symlink/lm3658.pdf>

Lithium battery charger with charge current of 1A and battery pack voltage of 4.2 to 6V. Can safely charge a Li battery from USB power source.

PRT-13851 3.7V Lithium Battery

<https://www.digikey.com/product-detail/en/sparkfun-electronics/PRT-13851/1568-1493-ND/6605199>

<https://cdn.sparkfun.com/datasheets/Prototyping/spe-00-502535-400mah-en-1.0ver.pdf>

Will charge this from the solar panel for the USB output.

SN74LVC1G3157DBVR SPDT Switch

<https://www.digikey.com/product-detail/en/texas-instruments/SN74LVC1G3157DBVR/296-14908-1-ND/562548>

<http://www.ti.com/general/docs/suppproductinfo.tsp?distId=10&gotoUrl=http%3A%2F%2Fwww.ti.com%2Flit%2Fgpn%2Fsn74lvc1g3157>

Will make it so the device only charges battery when the solar panel is charging.

Buck Boost Voltage Regulator: RT4812

<https://www.digikey.com/product-detail/en/richtek-usa-inc/RT4812GJ8F/1028-1512-1-ND/5640521>

<https://www.richtek.com/assets/product_file/RT4812/DS4812-07.pdf>

Will boost battery 3.7V dc to 5V dc for USB output. Features 96% efficiency, output over voltage protection, and adjustable output voltage from 1.8V to 5.5V. Seems pretty good for this project.

Wireless Charger: Samsung 5V/2A wireless charger

Acquired. Is inefficient but that’s not why I’m choosing the wireless charger anyway.