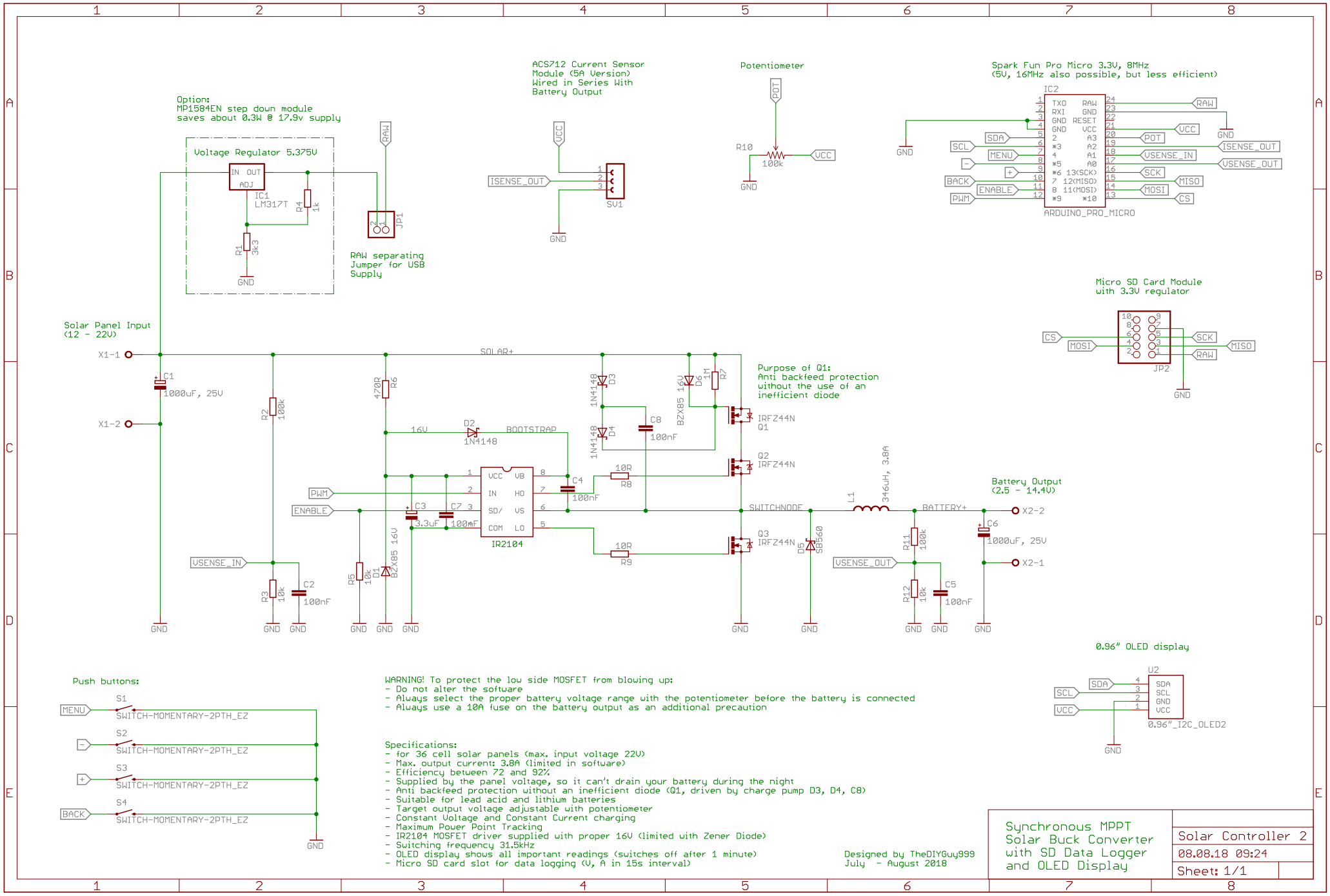
Option:
MP1584EN step down module
saves about 0.3W @ 17.9v supply
Voltage Regulator 5.375V
IN OUT
ADJ
IC1
LM317T
R4 1k
R1 3k3
GND
RAW
JP1
RAW separating
Jumper for USB
Supply
ACS712 Current Sensor
Module (5A Version)
Wired in Series With
Battery Output
VCC
ISENSE_OUT
SV1
GND
Potentiometer
POT
R10
100k
VCC
GND
Spark Fun Pro Micro 3.3V, 8MHz
(5V, 16MHz also possible, but less efficient)
IC2
TXO RAW
RXI GND
GND RESET
GND VCC
2 A3
*3 A2
4 A1
*5 A0
*6 13(SCK)
7 12(MISO)
8 11(MOSI)
*9 *10
ARDUINO_PRO_MICRO
SDA
SCL
MENU
-
+
BACK
ENABLE
PWM
RAW
POT
VCC
VSENSE_IN
SCK
MISO
MOSI
CS
ISENSE_OUT
VSENSE_OUT
Micro SD Card Module
with 3.3V regulator
JP2
CS
MOSI
SCK
MISO
RAW
Solar Panel Input
(12 - 22V)
X1-1
X1-2
C1
1000uF, 25V
SOLAR+
R2 100k
R6 470R
16V
D2
1N4148
BOOTSTRAP
D3 1N4148
D4 1N4148
C8
100nF
D6 BZX85 16V
R7 1M
Purpose of Q1:
Anti backfeed protection
without the use of an
inefficient diode
IRFZ44N
Q1
Q2
IRFZ44N
Q3
IRFZ44N
PWM
ENABLE
VCC VB
IN HO
SD/ VS
COM LO
IR2104
C4
100nF
R8 10R
R9 10R
C3
3.3uF
C7
100nF
SWITCHNODE
L1 346uH, 3.8A
BATTERY+
Battery Output
(2.5 - 14.4V)
X2-2
X2-1
C6
1000uF, 25V
D5 SB560
R11 100k
R12 10k
C5
100nF
VSENSE_OUT
VSENSE_IN
R3 10k
C2
100nF
R5 10k
D1 BZX85 16V
GND
0.96" OLED display
U2
SDA
SCL
GND
VCC
0.96"_I2C_OLED2
Push buttons:
MENU
S1
SWITCH-MOMENTARY-2PTH_EZ
-
S2
SWITCH-MOMENTARY-2PTH_EZ
+
S3
SWITCH-MOMENTARY-2PTH_EZ
BACK
S4
SWITCH-MOMENTARY-2PTH_EZ
WARNING! To protect the low side MOSFET from blowing up:
- Do not alter the software
- Always select the proper battery voltage range with the potentiometer before the battery is connected
- Always use a 10A fuse on the battery output as an additional precaution
Specifications:
- for 36 cell solar panels (max. input voltage 22V)
- Max. output current: 3.8A (limited in software)
- Efficiency between 72 and 92%
- Supplied by the panel voltage, so it can't drain your battery during the night
- Anti backfeed protection without an inefficient diode (Q1, driven by charge pump D3, D4, C8)
- Suitable for lead acid and lithium batteries
- Target output voltage adjustable with potentiometer
- Constant Voltage and Constant Current charging
- Maximum Power Point Tracking
- IR2104 MOSFET driver supplied with proper 16V (limited with Zener Diode)
- Switching frequency 31.5kHz
- OLED display shows all important readings (switches off after 1 minute)
- Micro SD card slot for data logging (V, A in 15s interval)
Designed by TheDIYGuy999
July - August 2018
Synchronous MPPT
Solar Buck Converter
with SD Data Logger
and OLED Display
Solar Controller 2
08.08.18 09:24
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