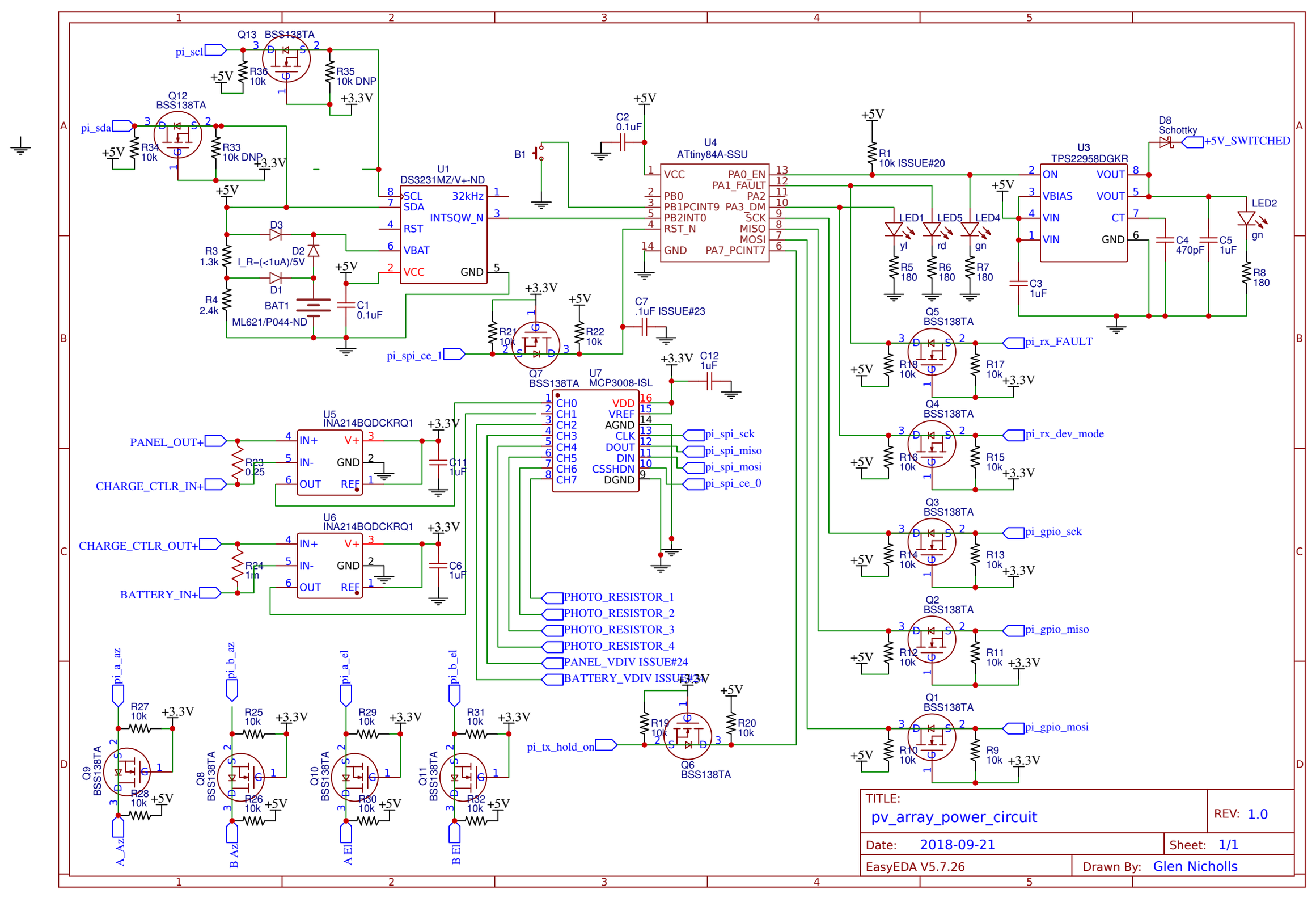
Q13 BSS138TA
pi_scl
R36 10k
R35 10k DNP
Q12 BSS138TA
pi_sda
R34 10k
R33 10k DNP
U1 DS3231MZ/V+-ND
SCL
SDA
RST
VBAT
VCC
32kHz
INTSQW_N
GND
D3
D2
D1
I_R=(<1uA)/5V
R3 1.3k
R4 2.4k
BAT1
ML621/P044-ND
C1 0.1uF
B1
C2 0.1uF
U4 ATtiny84A-SSU
VCC
PB0
PB1PCINT9
PB2INT0
RST_N
GND
PA0_EN
PA1_FAULT
PA2
PA3_DM
SCK
MISO
MOSI
PA7_PCINT7
R1 10k ISSUE#20
U3 TPS22958DGKR
ON
VBIAS
VIN
VIN
VOUT
VOUT
CT
GND
D8 Schottky
+5V_SWITCHED
LED1
LED5
LED4
LED2
yl
rd
gn
gn
R5 180
R6 180
R7 180
R8 180
C3 1uF
C4 470pF
C5 1uF
R21 10k
R22 10k
Q7 BSS138TA
pi_spi_ce_1
C7 .1uF ISSUE#23
U7 MCP3008-ISL
CH0
CH1
CH2
CH3
CH4
CH5
CH6
CH7
VDD
VREF
AGND
CLK
DOUT
DIN
CSSHDN
DGND
C12 1uF
pi_spi_sck
pi_spi_miso
pi_spi_mosi
pi_spi_ce_0
U5 INA214BQDCKRQ1
PANEL_OUT+
CHARGE_CTLR_IN+
R23 0.25
C11 1uF
U6 INA214BQDCKRQ1
CHARGE_CTLR_OUT+
BATTERY_IN+
R24 1m
C6 1uF
PHOTO_RESISTOR_1
PHOTO_RESISTOR_2
PHOTO_RESISTOR_3
PHOTO_RESISTOR_4
PANEL_VDIV ISSUE#24
BATTERY_VDIV ISSUE#24
Q5 BSS138TA
pi_rx_FAULT
R18 10k
R17 10k
Q4 BSS138TA
pi_rx_dev_mode
R16 10k
R15 10k
Q3 BSS138TA
pi_gpio_sck
R14 10k
R13 10k
Q2 BSS138TA
pi_gpio_miso
R12 10k
R11 10k
Q1 BSS138TA
pi_gpio_mosi
R10 10k
R9 10k
R19 10k
R20 10k
Q6 BSS138TA
pi_tx_hold_on
pi_a_az
pi_b_az
pi_a_el
pi_b_el
R27 10k
R25 10k
R29 10k
R31 10k
R28 10k
R26 10k
R30 10k
R32 10k
Q9 BSS138TA
Q8 BSS138TA
Q10 BSS138TA
Q11 BSS138TA
A_Az
B Az
A El
B El
+5V
+3.3V
TITLE:
pv_array_power_circuit
REV: 1.0
Date: 2018-09-21
Sheet: 1/1
EasyEDA V5.7.26
Drawn By: Glen Nicholls

PCB NOTES:

* D for charge circuit are DB2J314 or similar SMD diode
* +5V comes from USB micro type B
* +5V_switch_voltage is the regulated 5V power for pi/peripherals
* D2 - select diode of small inverse current (I_R=1uA below/5V)
* DNP should be in schematic and PCB, but not placed
* 5mAh battery is ML621 or P044-ND from digikey
* Reference AAA4000COL19.pdf for R3/R4 changes for different battery
* To ensure <330mA of inrush current, 470pF Chosen based on SR=0.146*C_t+14.78 for CT
* SR requires >220us for to achieve <330mA inrush current
* CT capacitor should be X5R/X7R dialectric rating with >25V rating
* dV = I_load*R_on to give the voltage drop fron in/out
* Reference TPS22958DGKR datasheet for layout example
* NOTE: All the 5V traces from USB and to PI power need to support 3A at 5V

OPERATION:
DS3231 ALARM to turn on power:
* When an ALARM(active low) is triggered, it forces interrupt on ATTiny
ATTiny84
* Active low INT from DS3231 will assert EN/ON pin on load switch high
* Active low INT from push button asserts EN/ON pin on load switch. will
  also assert pi_rx_dev_mode so pi knows it should halt running tracking
  so it can be operated on by user
* Active high INT from pi: when pi wakes up, it needs to assert pi_tx_hold_on
  while it is on.
* If pi_tx_hold_on goes low, uC holds power on for programmable time to allow
  safe shutdown of pi. Then EN is tied to GND to turn load switch off
* SPI inputs used for programming a .hex via ICSP
Shutting down pi:
* Set ALARM time for next wake up.
* Deassert pi_tx_hold_on to signal power-down is commencing
Limitations:
* NO support yet for shutdown button. Might add this with SW for ATTiny84

TITLE: New Schematic	REV: 1.0
Date: 2018-10-29	Sheet: 1/1
EasyEDA V5.8.20	Drawn By: glennicholls0