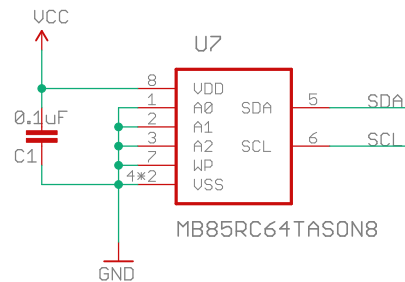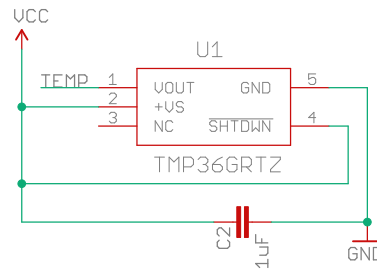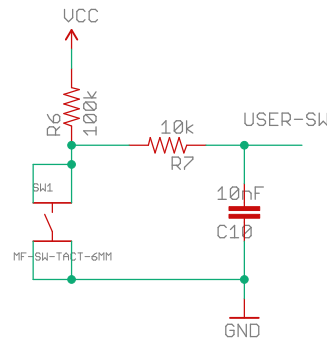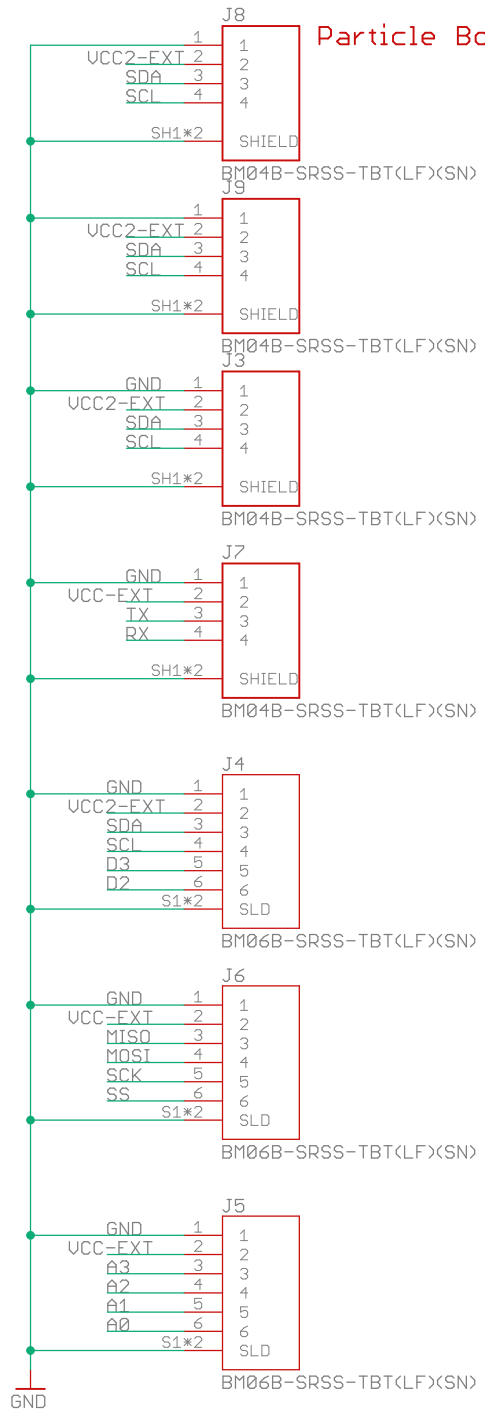# Particle Boron / Xenon / Argon Carrier Board for Unprotected Environments

J8
VCC2-EXT
SDA
SCL
SH1*2
1 2 3 4
SHIELD
BM04B-SRSS-TBT(LF)(SN)

J9
VCC2-EXT
SDA
SCL
SH1*2
1 2 3 4
SHIELD
BM04B-SRSS-TBT(LF)(SN)

J3
GND
VCC2-EXT
SDA
SCL
SH1*2
1 2 3 4
SHIELD
BM04B-SRSS-TBT(LF)(SN)

J7
GND
VCC-EXT
TX
RX
SH1*2
1 2 3 4
SHIELD
BM04B-SRSS-TBT(LF)(SN)

J4
GND
VCC2-EXT
SDA
SCL
D3
D2
S1*2
1 2 3 4 5 6
SLD
BM06B-SRSS-TBT(LF)(SN)

J6
GND
VCC-EXT
MISO
MOSI
SCK
SS
S1*2
1 2 3 4 5 6
SLD
BM06B-SRSS-TBT(LF)(SN)

J5
GND
VCC-EXT
A3
A2
A1
A0
S1*2
1 2 3 4 5 6
SLD
BM06B-SRSS-TBT(LF)(SN)

GND

VCC
R6 100k
SW1
MF-SW-TACT-6MM
10k R7
USER-SW
10nF C10
GND

U1
TEMP
VCC
VOUT
+VS
NC
GND
SHTDWN
1 2 3
5 4
TMP36GRTZ
C2 1uF
GND

U7
VCC
0.1uF C1
VDD
A0
A1
A2
WP
VSS
8 1 2 3 7 4*2
SDA
SCL
5 6
SDA
SCL
MB85RC64TASON8
GND

BORON
RST — RST
VCC — 3V3
MD — MD
GND — GND
A0 — A0
A1 — A1
A2 — A2
A3 — A3
TEMP — A4
SS — A5
SCK — SCK
MOSI — MO
MISO — MI
RX — RX
TX — TX
NC — NC
LI+ — LI+ LI+
EN — EN EN
VUSB — VUSB VUSB
D8 — D8 WAKE
D7 — D7
D6 — D6
D5 — D5
D4 — D4 USER-SW
D3 — D3 D3
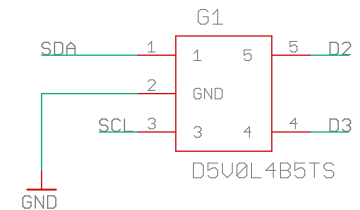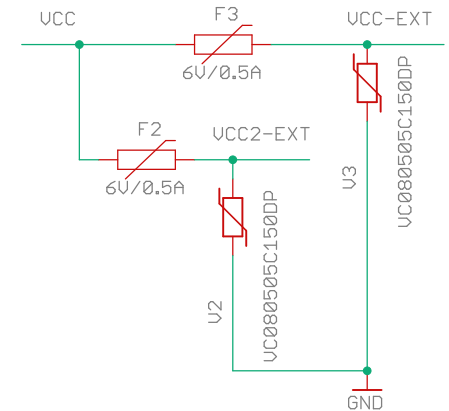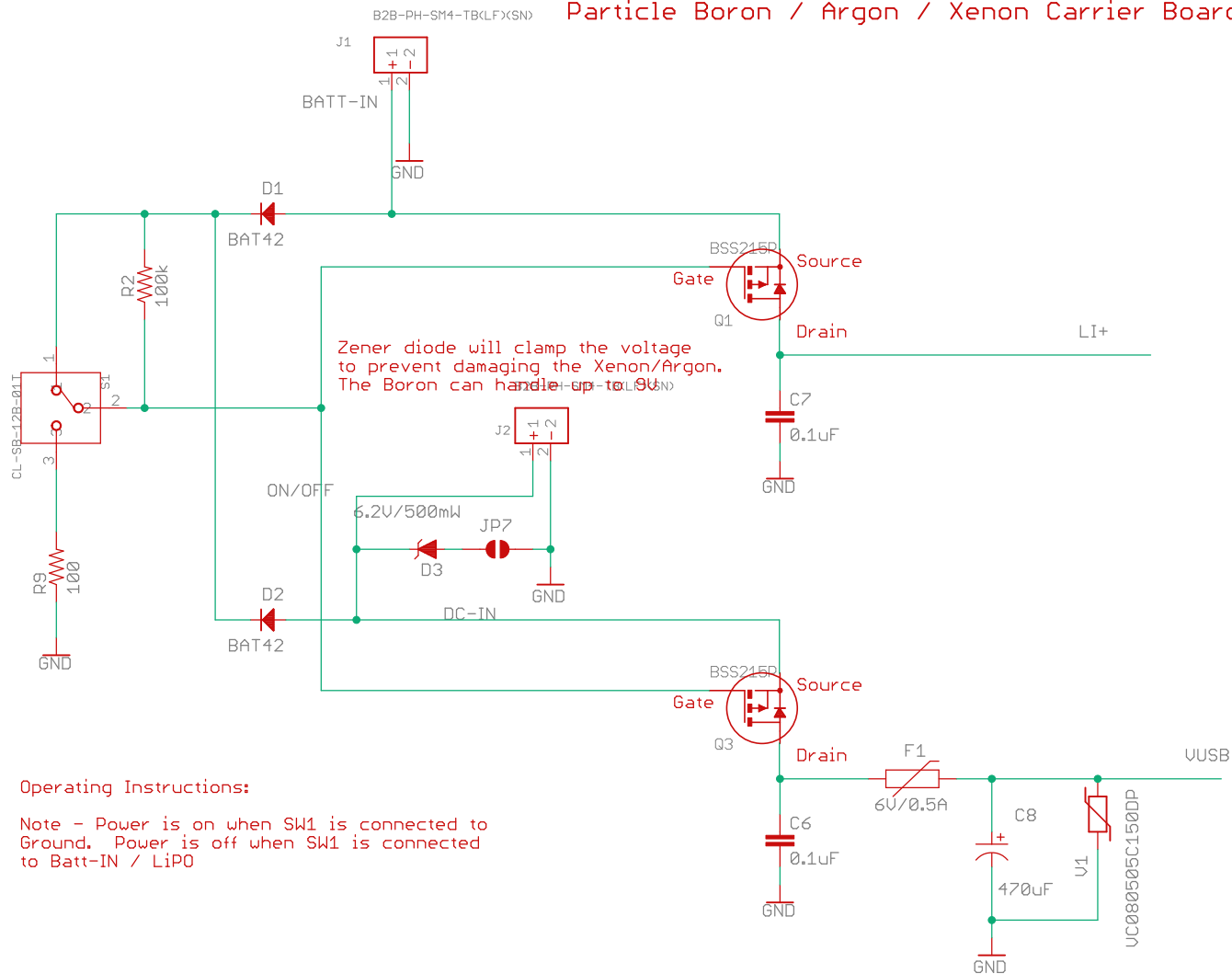D2 — D2 D2
SCL — SCL
SDA — SDA
VCC
R5 4.7k
R4 4.7k

Power either with DC source or Solar Panel — JST connector
1) External Power: 5V DC @ 2A
2) Solar Power: Recommend 3-5W @ 6V

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v1.7

Particle Boron / Argon / Xenon Carrier Board – Power Control

B2B-PH-SM4-TB(LF)(SN)

J1

BATT-IN

GND

D1
BAT42

R2
100k

VCC

F3
6V/0.5A

VCC-EXT

VC080505C150DP

BSS215P
Source
Gate
Q1
Drain

F2
6V/0.5A

VCC2-EXT

V3

LI+

Zener diode will clamp the voltage
to prevent damaging the Xenon/Argon.
The Boron can handle up to 9V.

VC080505C150DP
V2

CL-SB-12B-01T

ON/OFF

C7
0.1uF

GND

J2

GND

6.2V/500mW

JP7

D3

GND

R9
100

D2
BAT42

DC-IN

G1

SDA   1   1   5   5   D2

2   GND

SCL   3   3   4   4   D3

D5V0L4B5TS

GND

GND

BSS215P
Source
Gate
Q3
Drain

F1
6V/0.5A

VUSB

C6
0.1uF

C8
+
470uF

V1
VC080505C150DP

GND

GND

Operating Instructions:

Note – Power is on when SW1 is connected to
Ground. Power is off when SW1 is connected
to Batt-IN / LiPO

Operating Instructions:

SW1 – Connects / disconnects power for long term storage and transport.
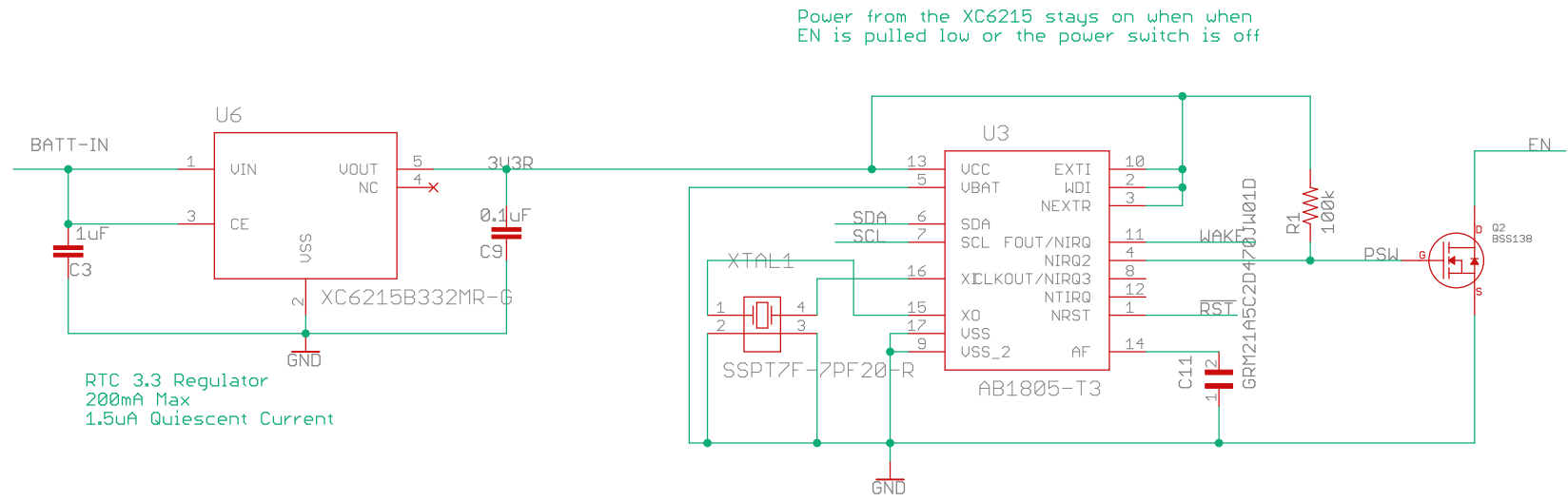Only RTC VBatt runs when the switch is off.

SW1 – Enables the two power switches and is powered by either Battery or DC-In

RTC Power will be the higher or Li+ or DC-In

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v1.7

Particle Boron / Argon / Xenon Carrier Board - Real Time Clock

Power from the XC6215 stays on when when
EN is pulled low or the power switch is off

U6

BATT-IN

Pin	Label		Label	Pin
1	VIN		VOUT	5
			NC	4
3	CE			

VSS — 2

1uF
C3

0.1uF
C9

3V3R

XC6215B332MR-G

GND

RTC 3.3 Regulator
200mA Max
1.5uA Quiescent Current

U3

EN

Pin	Label	Label	Pin
13	VCC	EXTI	10
5	VBAT	WDI	2
		NEXTR	3
6	SDA		
7	SCL	FOUT/NIRQ	11
		NIRQ2	4
16	XI CLKOUT/NIRQ3		8
		NTIRQ	12
15	XO	NRST	1
17	VSS		
9	VSS_2	AF	14

SDA
SCL

WAKE

RST

AB1805-T3

XTAL1

1		4
2		3

SSPT7F-7PF20-R

C11

GRM21A5C2D470JW01D

R1
100k

Q2
BSS138

PSW

GND

Based on this Application Note
https://github.com/particle-iot/app-notes/tree/master/AN023-Watchdog-Timers

Operating Instructions:

BATT-IN is on whenever a battery is connected

Li+ is on when there is a battery and when the switch SW1 is on.

This circuit combines both RTC and watchdog functionality

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v1.7

CHANGE LOG

1.5 - Changed to AB1805 for RTC and Watchdog - Major Change
1.6 - Reduced the number of Qwiic connectors - Minor Change
1.6a - Changed to vertical input for JST connectors - Minor Change
1.7 - Changed high-side switching from TI TPS22810 to P-MOSFET BSS215P and the Crystal- Minor Change