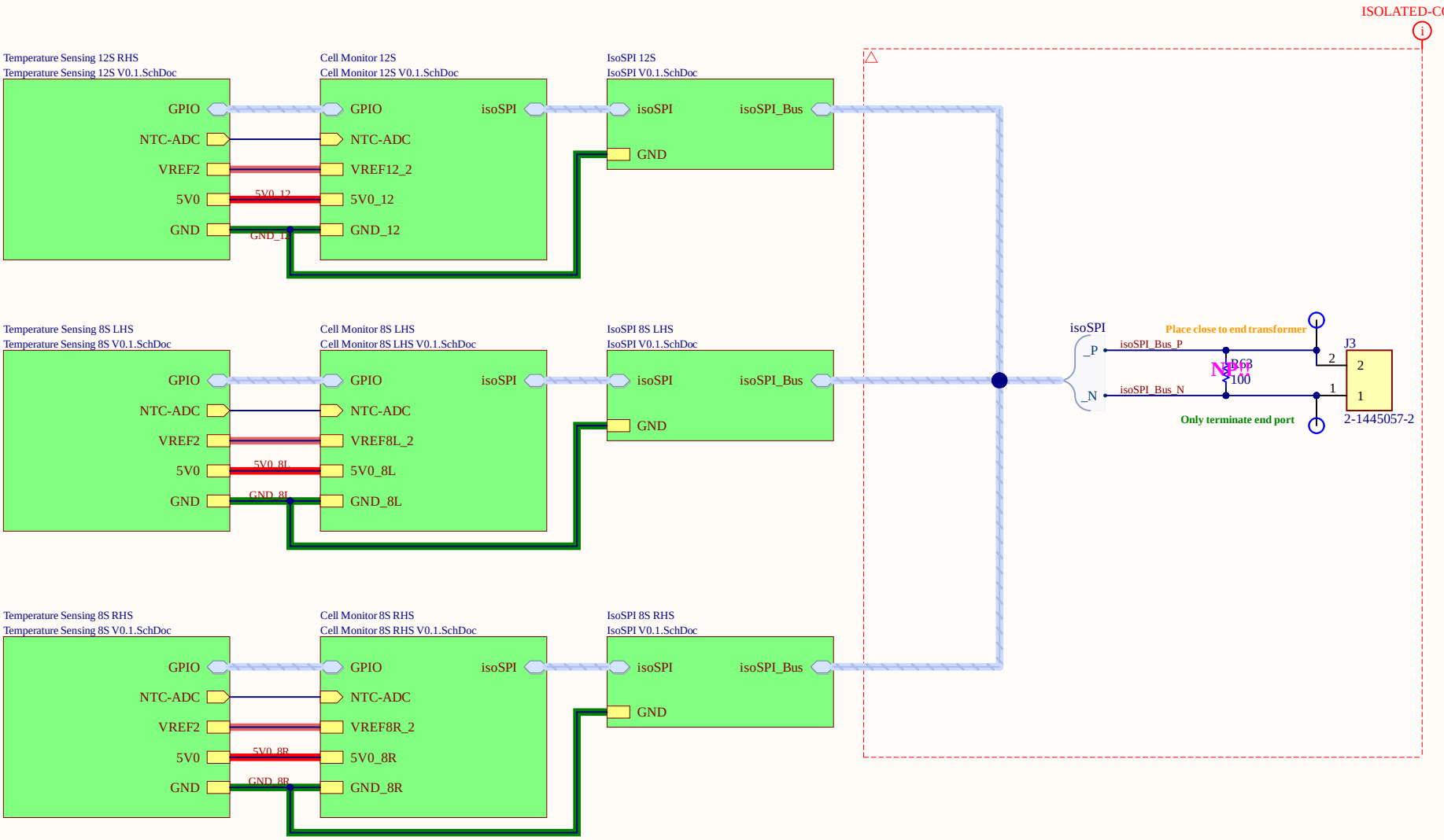

MH1 MH2 MH3 MH4 MH5 MH6

Mounting Holes

Tractive Voltage

Graphics

Title	BMS Slave V0.1.SchDoc
Author	William J
Version	V0.1
Date	3/04/2022
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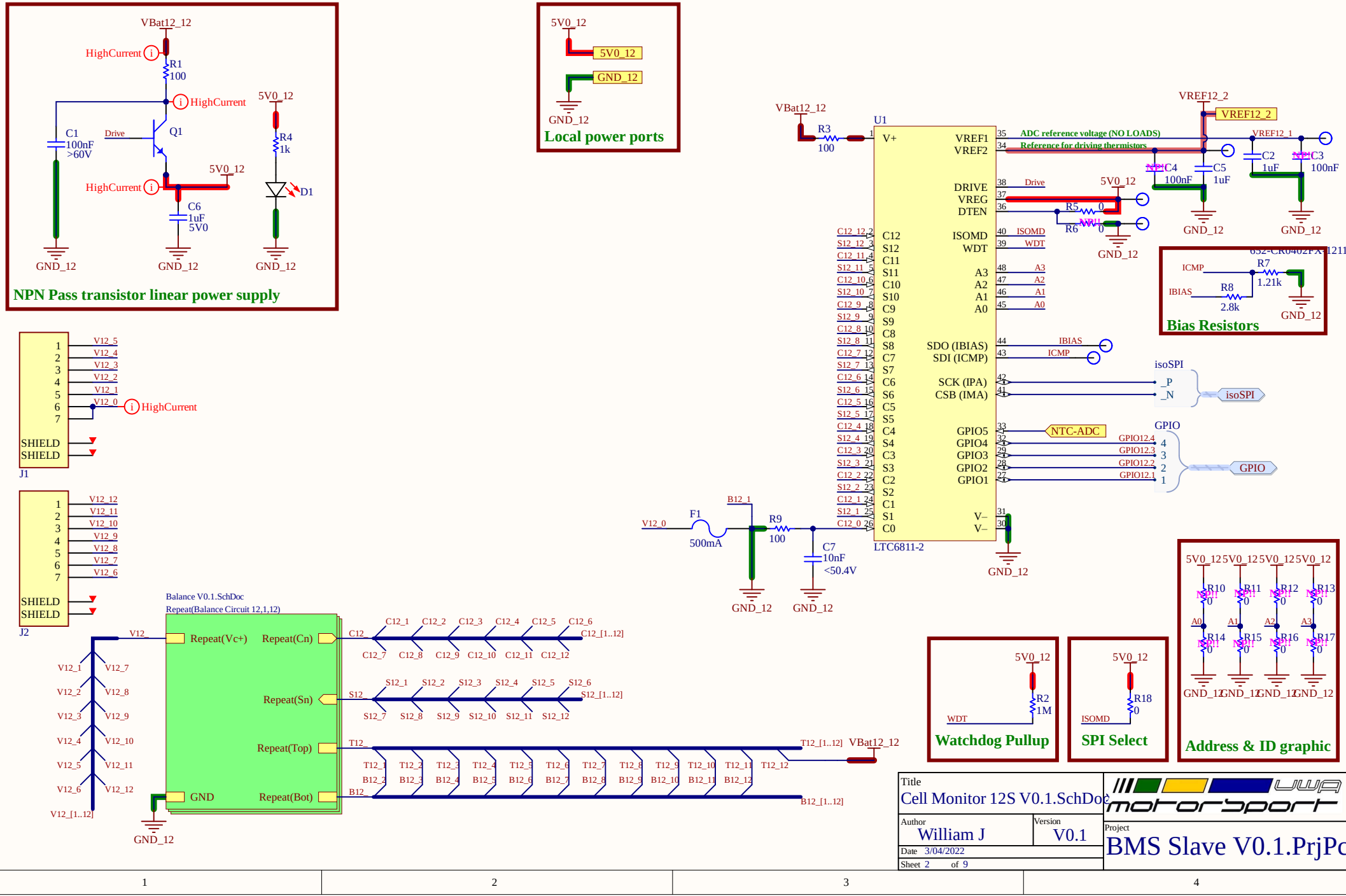
Project	BMS Slave V0.1.PrjPcb


NPN Pass transistor linear power supply
Local power ports
Bias Resistors
Watchdog Pullup
SPI Select
Address & ID graphic
LTC6811-2
Balance V0.1.SchDoc
Repeat(Balance Circuit 12,1,12)
Repeat(Vc+)
Repeat(Cn)
Repeat(Sn)
Repeat(Top)
Repeat(Bot)
GND
Title
Cell Monitor 12S V0.1.SchDoc
Author
William J
Version
V0.1
Date 3/04/2022
Sheet 2 of 9
Project
BMS Slave V0.1.PrjPcb

GND

GND

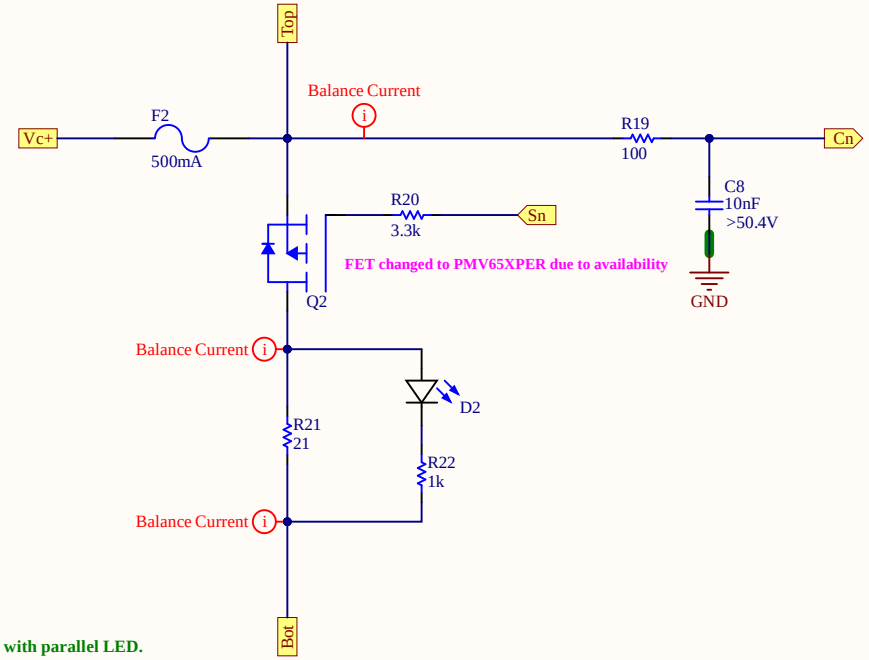
Local power ports

Vc+ is connected to FPC connector (direct to cell)

Cn is connected to BMS IC for cell measurement

Sn is connected to BMS IC for FET switching

Bot is connected to cell belows Top



Balance current, V/R = 4.2/21 = 200mA

Realistically a little less due to FET R_DS but a small increase with parallel LED.

Title	Balance V0.1.SchDoc
Author	William J
Version	V0.1
Date	3/04/2022
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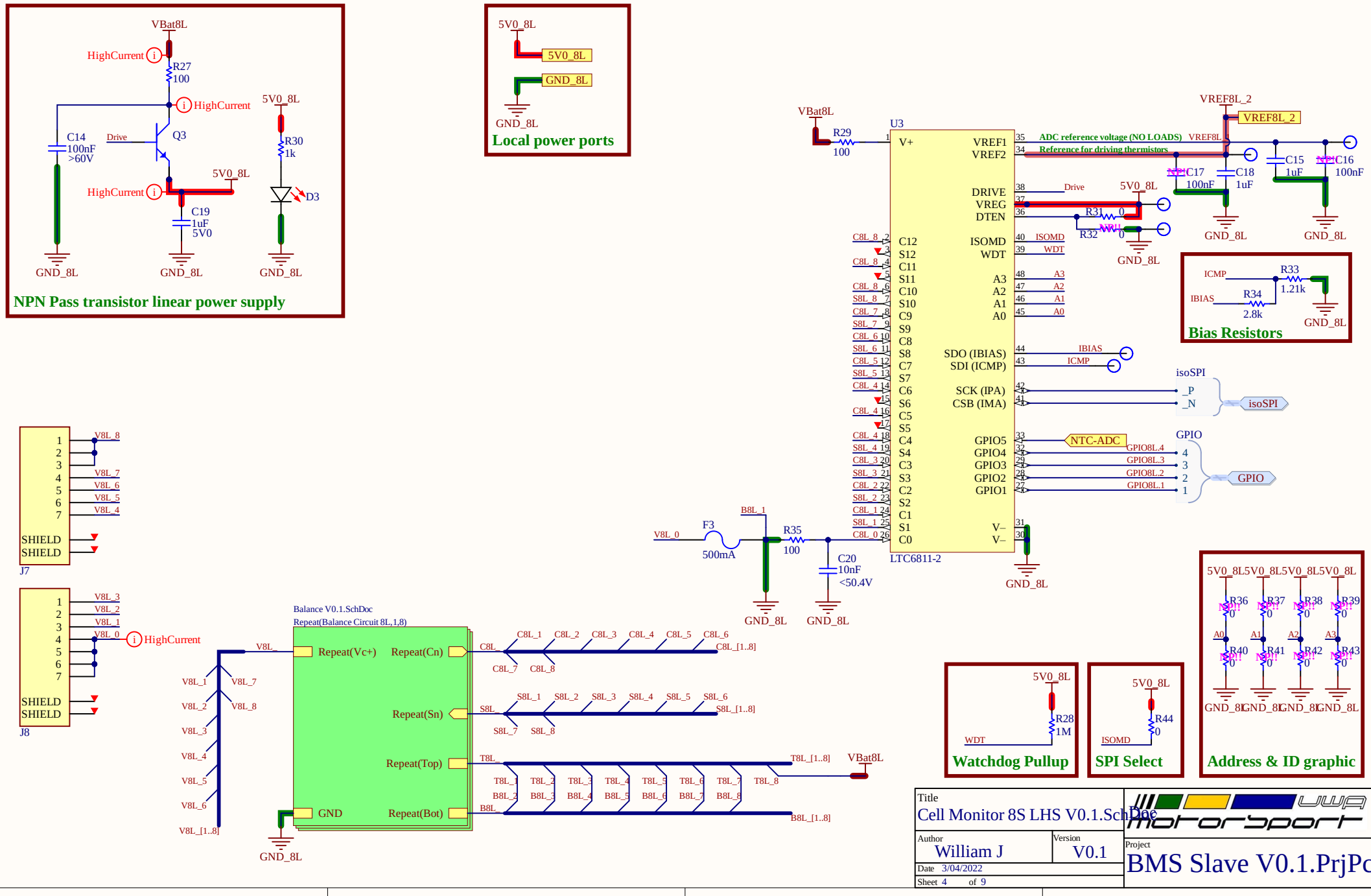
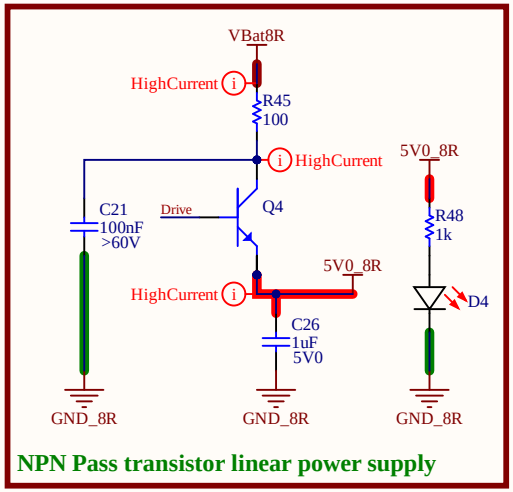
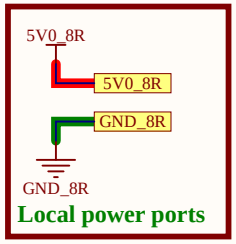
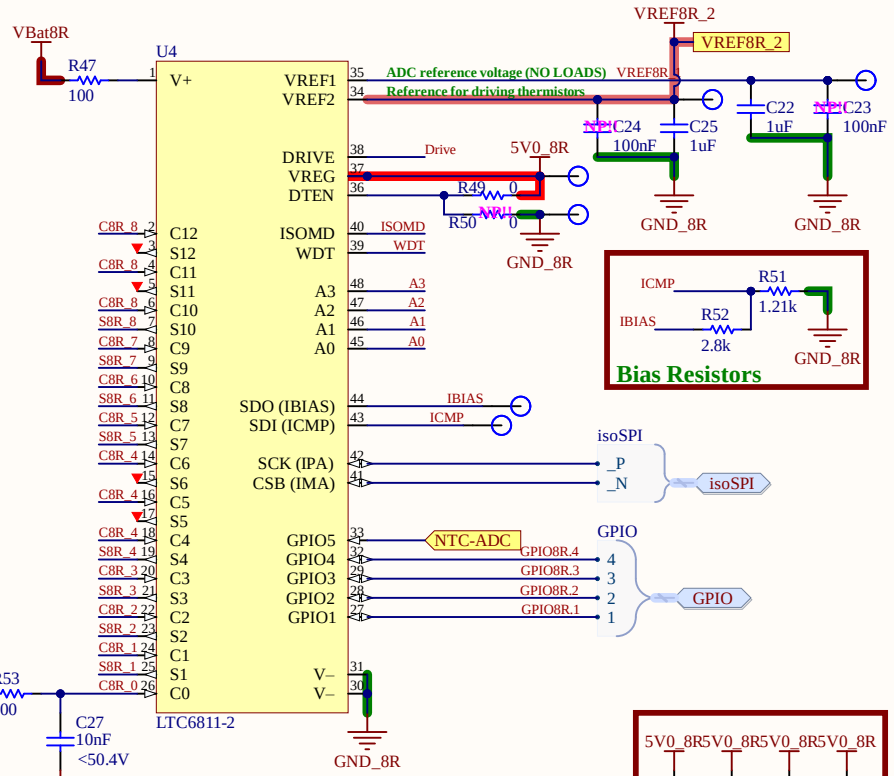
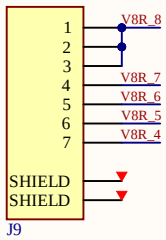
Project	BMS Slave V0.1.PrjPcb

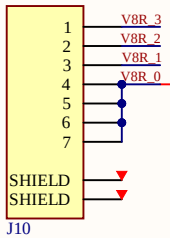

NPN Pass transistor linear power supply
VBat8L
HighCurrent
R27
100
C14
100nF
>60V
Drive
Q3
C19
1uF
5V0
R30
1k
D3
5V0_8L
GND_8L
Local power ports
GND_8L
U3
LTC6811-2
V+
VREF1
VREF2
DRIVE
VREG
DTEN
ISOMD
WDT
SDO (IBIAS)
SDI (ICMP)
SCK (IPA)
CSB (IMA)
GPIO5
GPIO4
GPIO3
GPIO2
GPIO1
V–
R29
100
VREF8L_2
ADC reference voltage (NO LOADS)
Reference for driving thermistors
C15
1uF
C16
100nF
C17
100nF
C18
1uF
R31
0
R32
0
Bias Resistors
ICMP
IBIAS
R33
1.21k
R34
2.8k
isoSPI
_P
_N
GPIO
NTC-ADC
GPIO8L.4
GPIO8L.3
GPIO8L.2
GPIO8L.1
F3
500mA
R35
100
C20
10nF
<50.4V
J7
J8
SHIELD
V8L_8
V8L_7
V8L_6
V8L_5
V8L_4
V8L_3
V8L_2
V8L_1
V8L_0
Balance V0.1.SchDoc
Repeat(Balance Circuit 8L,1,8)
Repeat(Vc+)
Repeat(Cn)
Repeat(Sn)
Repeat(Top)
Repeat(Bot)
GND
Watchdog Pullup
R28
1M
WDT
SPI Select
R44
0
ISOMD
Address & ID graphic
R36
R37
R38
R39
R40
R41
R42
R43
A0
A1
A2
A3
Title
Cell Monitor 8S LHS V0.1.SchDoc
Author
William J
Version
V0.1
Date
3/04/2022
Sheet 4 of 9
Project
BMS Slave V0.1.PrjPcb
UWA Motorsport

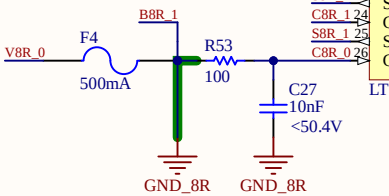


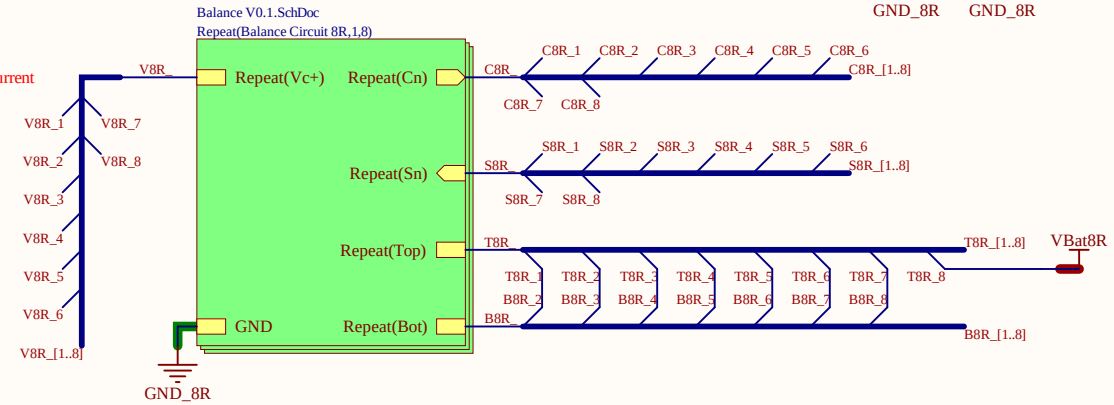


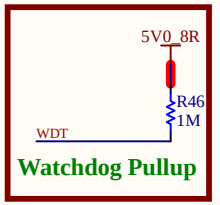


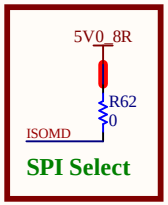


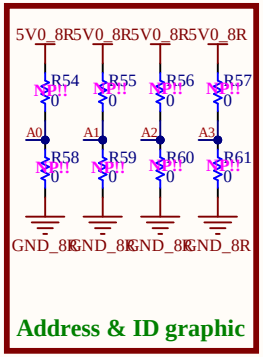




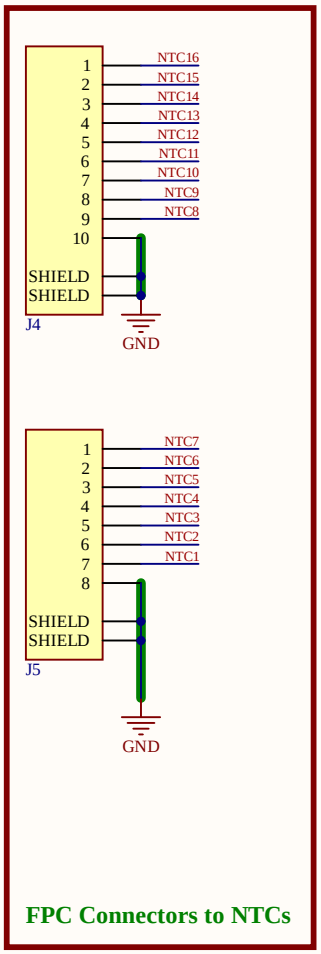


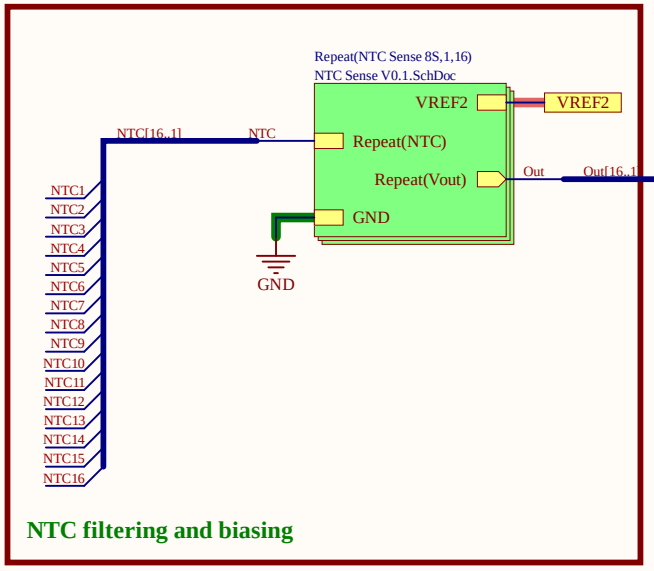


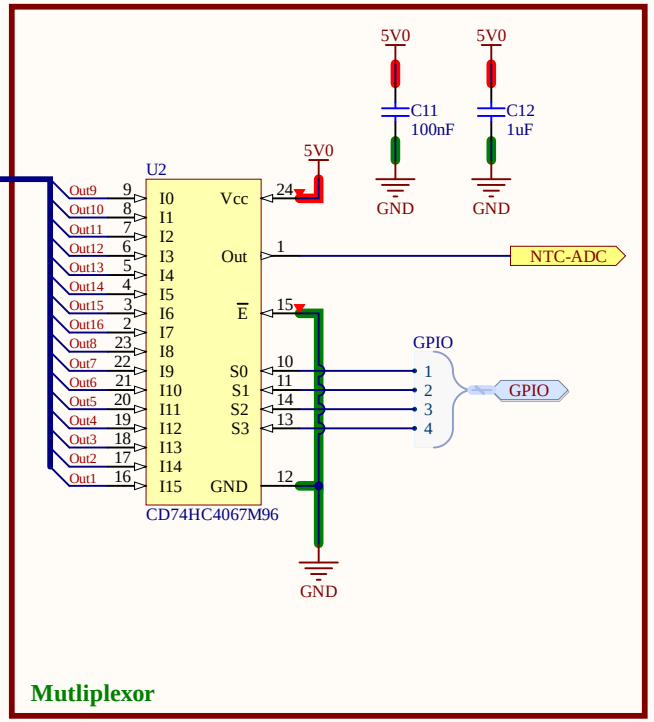


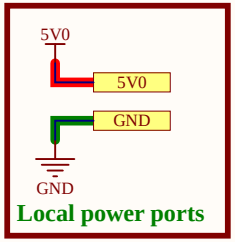


Title	Cell Monitor 8S RHS V0.1.SchDoc
Author	William J
Version	V0.1
Date	3/04/2022
Sheet	5 of 9
Project	BMS Slave V0.1.PrjPcb

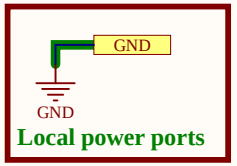








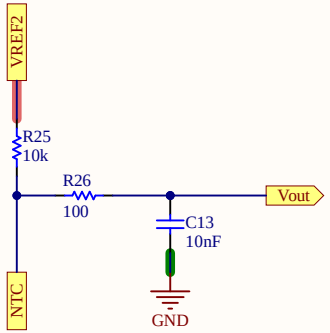
Title	Temperature Sensing 8S V0.1.SchDoc	
Author	William J	Version V0.1
Date	17/03/2022	
Sheet	6 of 9	
Project	BMS Slave V0.1.PrjPcb	



Max temperature allowed is 60 degrees, after which the accumulator will shut down.
Minimum temperature is estimated to be 10 degrees.

NTC thermistor PN: NCU18XH103D60RB

Corresponds to: ...mV at Vout



NTC leads to FPC 10k NTC thermistor. Ground path is provided on FPC.

Title	NTC Sense V0.1.SchDoc
Author	William J
Version	V0.1
Date	17/03/2022
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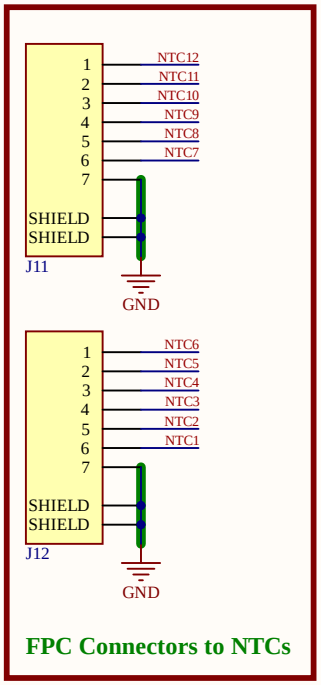
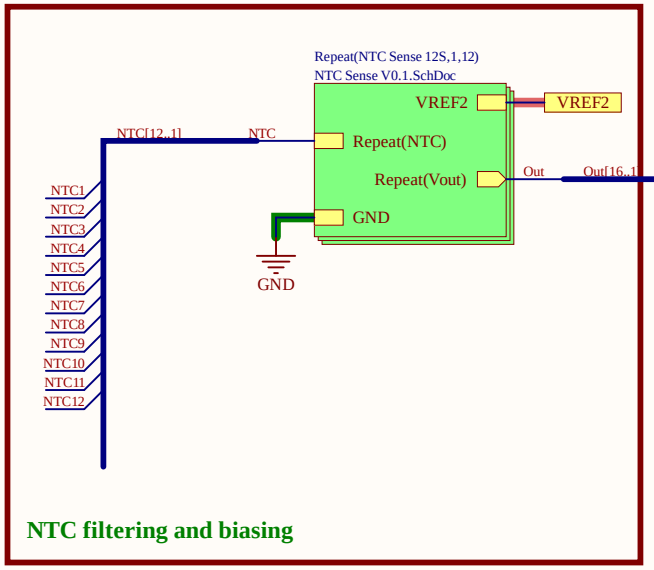
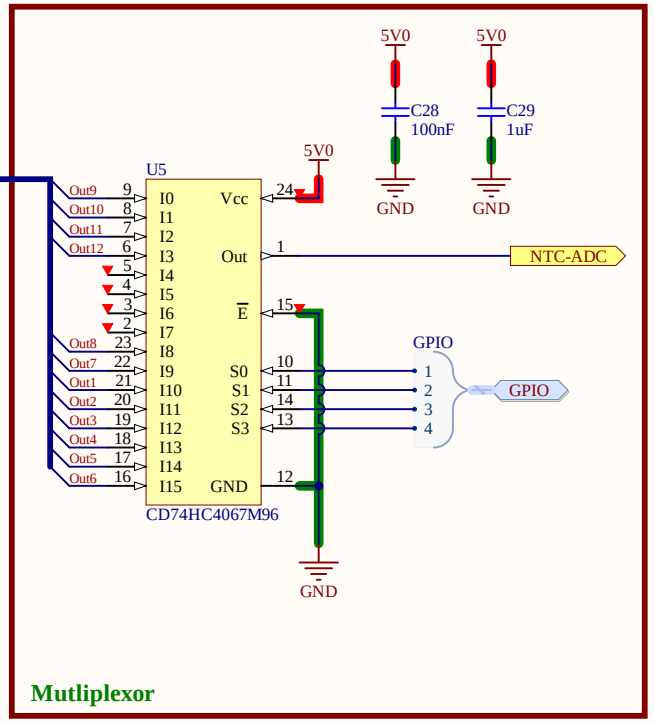
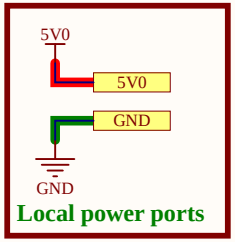
Project	BMS Slave V0.1.PrjPcb

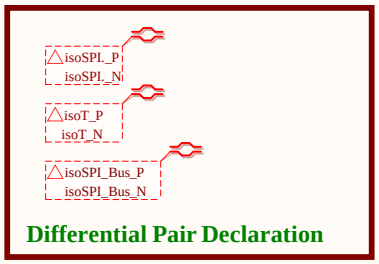


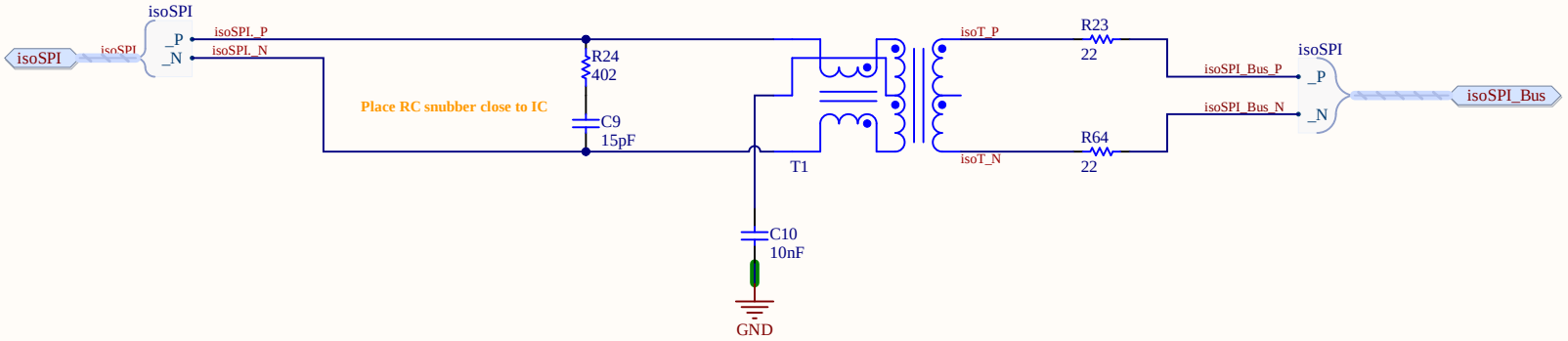






Title	Temperature Sensing 12S V0.1.SchDoc	
Author: William J	Version: V0.1	Project: BMS Slave V0.1.PrjPcb
Date: 17/03/2022		
Sheet 8 of 9		





http://www.hagtech.com/pdf/impedance.pdf

$$Z_o = \left(\frac{160}{\sqrt{\varepsilon_{eff}}}\right) \cdot \ln\left(\frac{2s}{w}\right)$$

$$\varepsilon_{eff} = 1 + \left(\frac{\varepsilon_r - 1}{\pi}\right) \cdot \arctan\left(\frac{2h}{w}\right)$$

Target Z_0:	100
Calculated Z_0:	100.795

Deviation
0.8%

ε_{eff}	2.5786
s	11
w	8
h	63
ε_r	4.29

Title	IsoSPI V0.1.SchDoc	
Author	William J	Version V0.1
Date	17/03/2022	
Sheet	9 of 9	
Project	BMS Slave V0.1.PrjPcb	