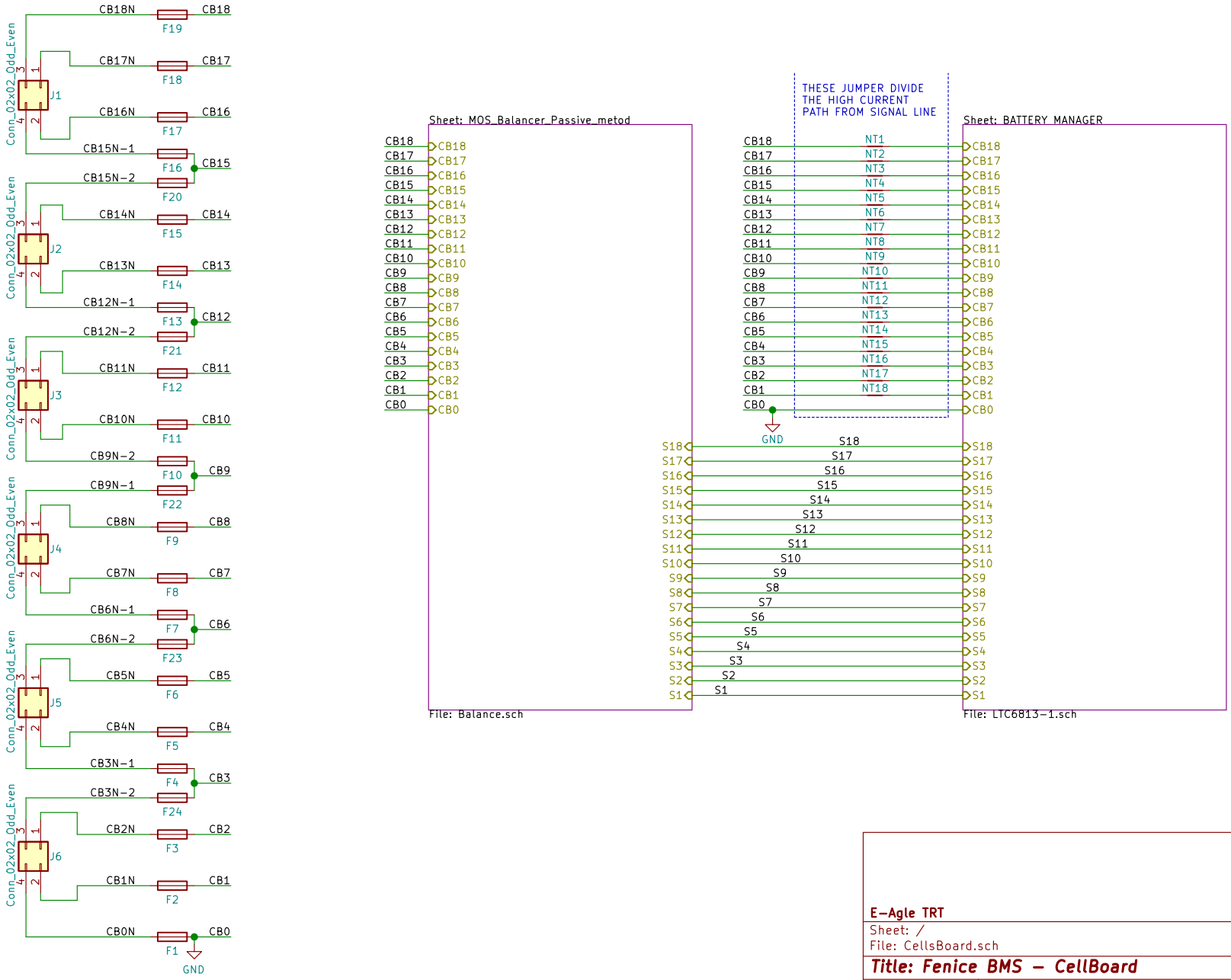


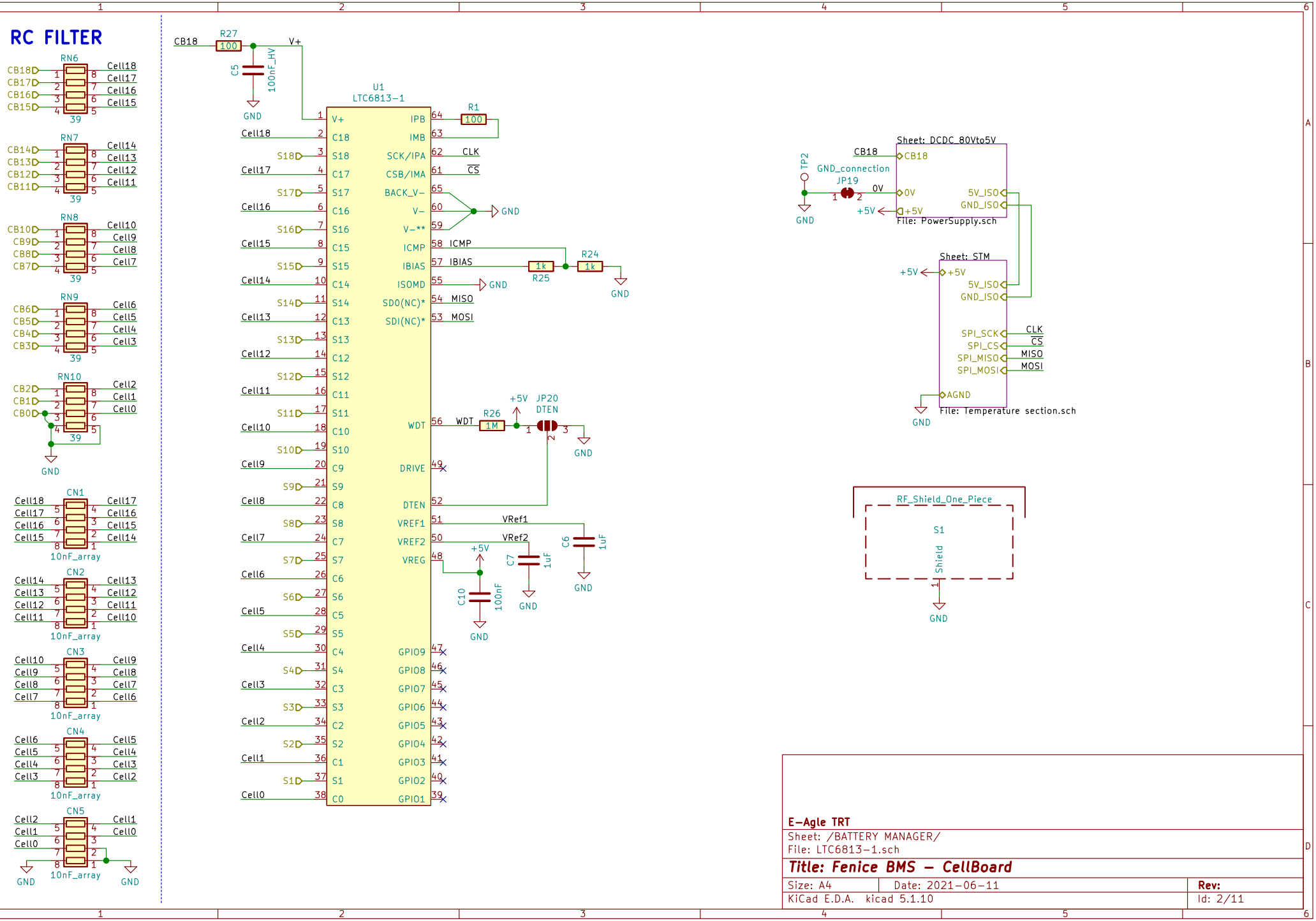
E-Agle TRT

Sheet: /

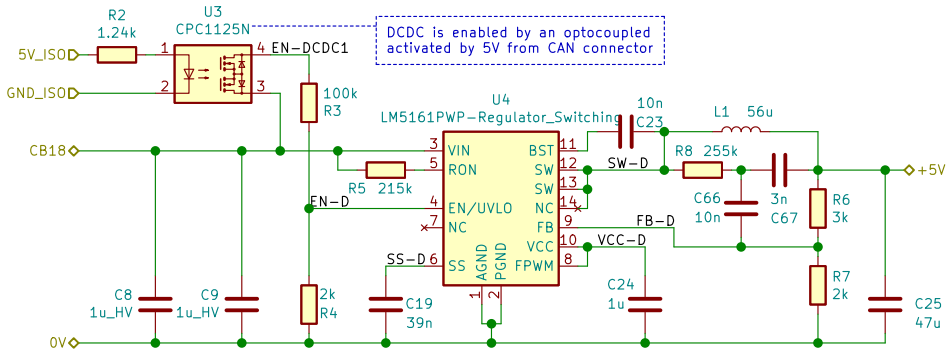
File: CellsBoard.sch

Title: Fenice BMS – CellBoard

Size: A4	Date: 2021-06-11	**Rev:**
KiCad E.D.A. kicad 5.1.10		Id: 1/11

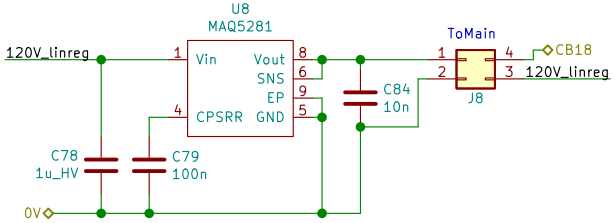

RC FILTER
RN6
CB18
CB17
CB16
CB15
Cell18
Cell17
Cell16
Cell15
39
RN7
CB14
CB13
CB12
CB11
Cell14
Cell13
Cell12
Cell11
39
RN8
CB10
CB9
CB8
CB7
Cell10
Cell9
Cell8
Cell7
39
RN9
CB6
CB5
CB4
CB3
Cell6
Cell5
Cell4
Cell3
39
RN10
CB2
CB1
CB0
Cell2
Cell1
Cell0
39
GND
CN1
Cell18
Cell17
Cell16
Cell15
Cell14
10nF_array
CN2
Cell14
Cell13
Cell12
Cell11
Cell10
10nF_array
CN3
Cell10
Cell9
Cell8
Cell7
Cell6
10nF_array
CN4
Cell6
Cell5
Cell4
Cell3
Cell2
10nF_array
CN5
Cell2
Cell1
Cell0
10nF_array
GND
GND
CB18
R27
100
V+
C5
100nF_HV
GND
U1
LTC6813-1
V+
C18
S18
C17
S17
C16
S16
C15
S15
C14
S14
C13
S13
C12
S12
C11
S11
C10
S10
C9
S9
C8
S8
C7
S7
C6
S6
C5
S5
C4
S4
C3
S3
C2
S2
C1
S1
C0
IPB
IMB
SCK/IPA
CSB/IMA
BACK_V-
V-
V-**
ICMP
IBIAS
ISOMD
SDO(NC)*
SDI(NC)*
WDT
DRIVE
DTEN
VREF1
VREF2
VREG
GPIO9
GPIO8
GPIO7
GPIO6
GPIO5
GPIO4
GPIO3
GPIO2
GPIO1
R1
100
CLK
CS
GND
ICMP
IBIAS
R24
1k
R25
1k
GND
MISO
MOSI
WDT
R26
1M
+5V
JP20
DTEN
GND
VRef1
VRef2
C6
1uF
C7
1uF
+5V
C10
100nF
GND
GND
Sheet: DCDC_80Vto5V
CB18
TP2
GND_connection
JP19
0V
+5V
0V
+5V
5V_ISO
GND_ISO
GND
File: PowerSupply.sch
Sheet: STM
+5V
+5V
5V_ISO
GND_ISO
SPI_SCK
SPI_CS
SPI_MISO
SPI_MOSI
CLK
CS
MISO
MOSI
AGND
GND
File: Temperature section.sch
RF_Shield_One_Piece
S1
Shield
GND
E-Agle TRT
Sheet: /BATTERY MANAGER/
File: LTC6813-1.sch
Title: Fenice BMS - CellBoard
Size: A4
Date: 2021-06-11
Rev:
KiCad E.D.A. kicad 5.1.10
Id: 2/11

Buck DCDC converter – 80V in – 5V 1A out



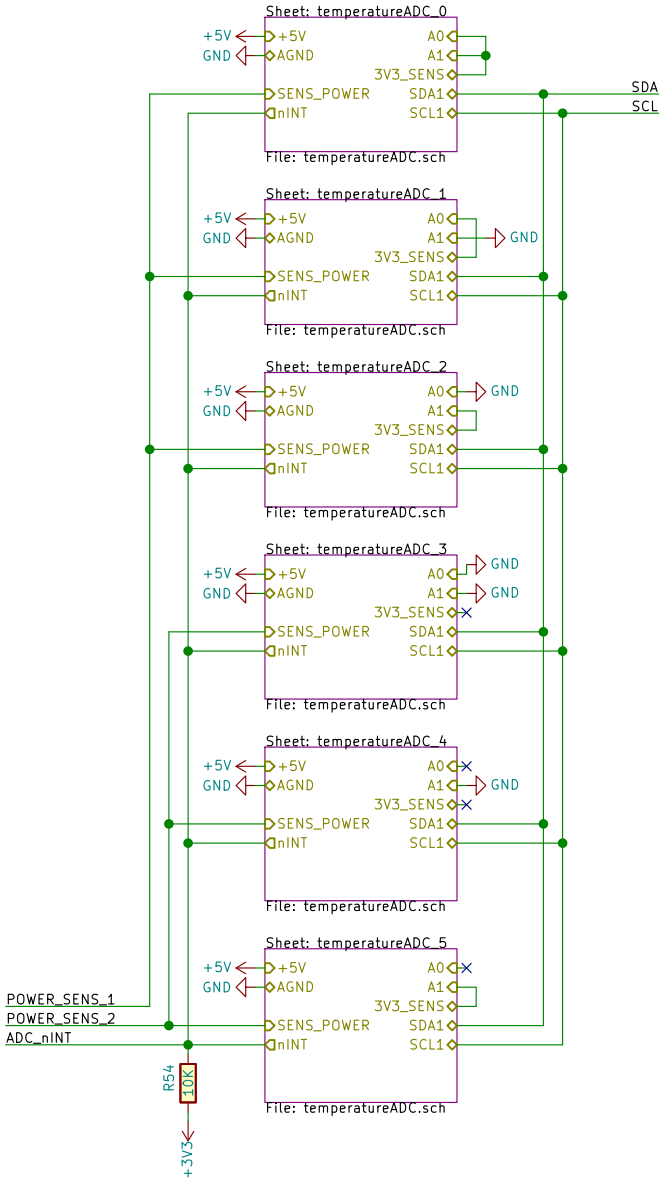
EN:
<0.35V SHUTDOWN state
<1.24V STAND-BY state
EN-D:
LOW Voltage 3.5V*18cells=63V

Linear regulator 5V – 25mA

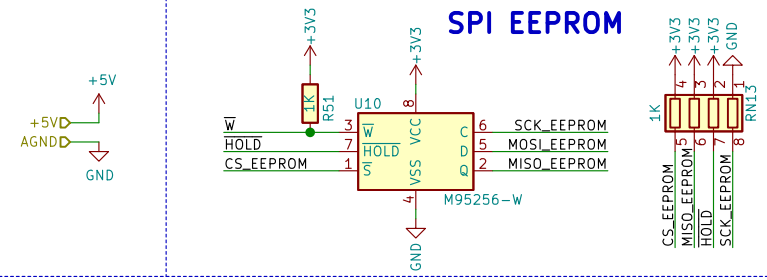


E-Agle TRT		
Sheet: /BATTERY MANAGER/DCDC_80Vto5V/		
File: PowerSupply.sch		
Title: Fenice BMS – CellBoard		
Size: A4	Date: 2021-06-11	**Rev:**
KiCad E.D.A. kicad 5.1.10		Id: 3/11

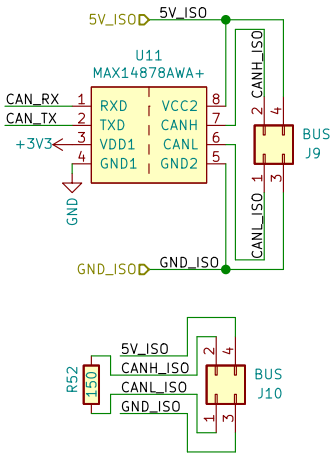
TEMPERATURE SENSORS



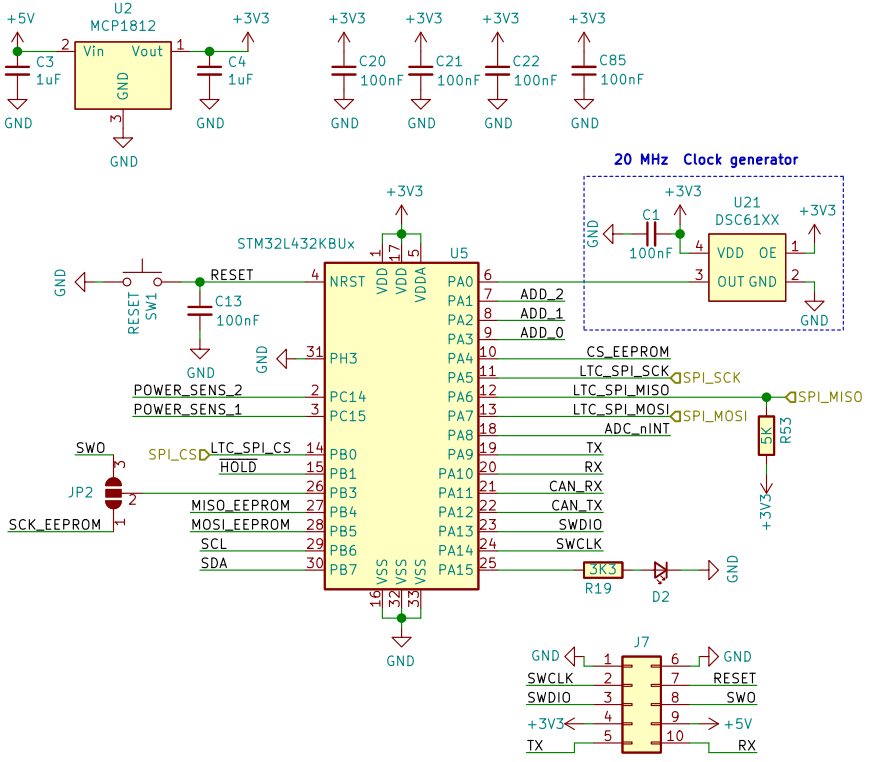
SPI EEPROM



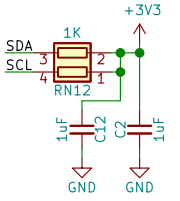
ISOLATED CANBUS



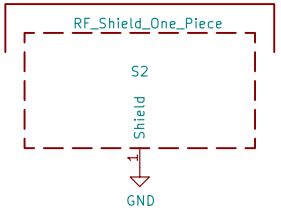
STM32G474 MCU + LINEAR REGULATOR + PROGRAMM PORT



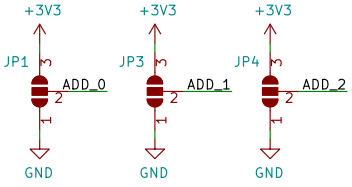
I2C PULL-UP RESISTOR



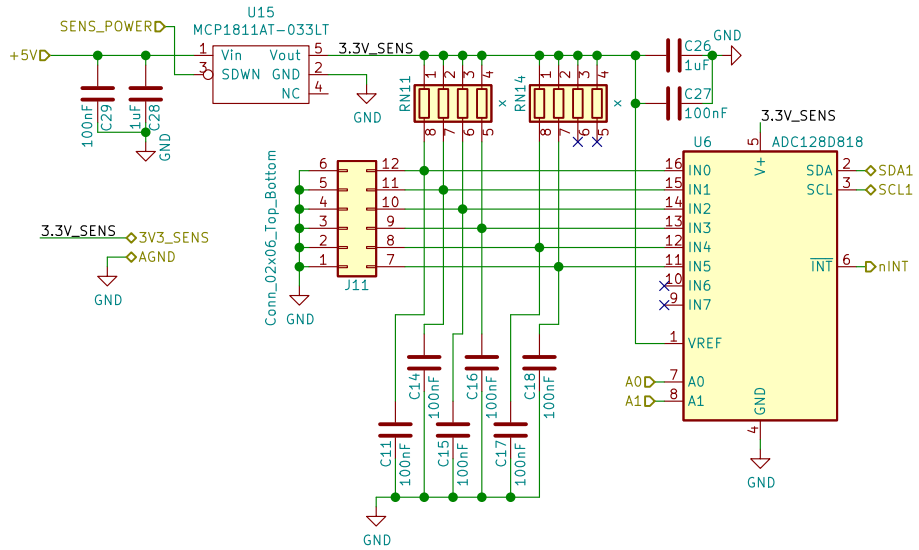
EMI SHIELD



CELLBOARD ADDRESS SELECTION



E-Agle TRT	
Sheet: /BATTERY MANAGER/STM/	
File: Temperature section.sch	
Title: Fenice BMS – CellBoard	
Size: A4	Date: 2021-06-11
KiCad E.D.A. kicad 5.1.10	Id: 4/11



E-Agle TRT		
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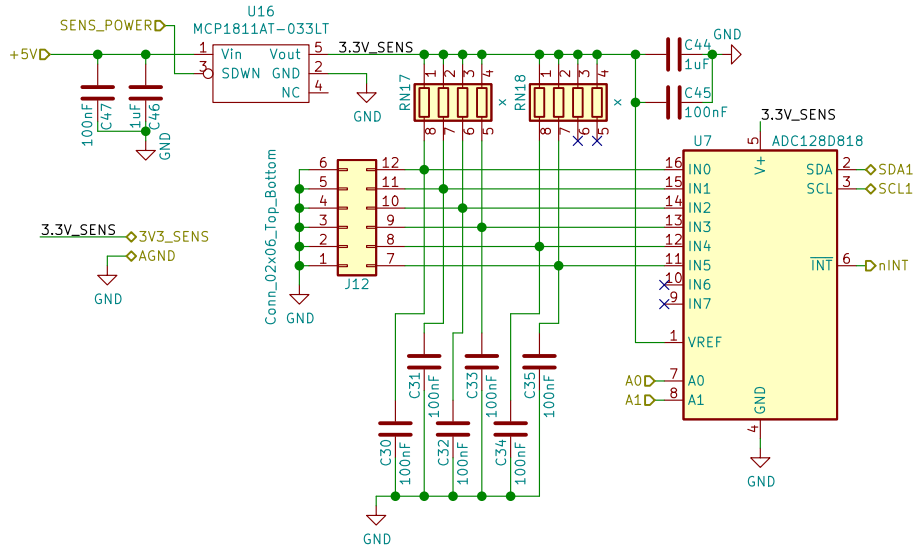
Title: Fenice BMS – CellBoard		
Size: A4	Date: 2021-06-11	**Rev:**
KiCad E.D.A. kicad 5.1.10		Id: 5/11



E-Agle TRT		
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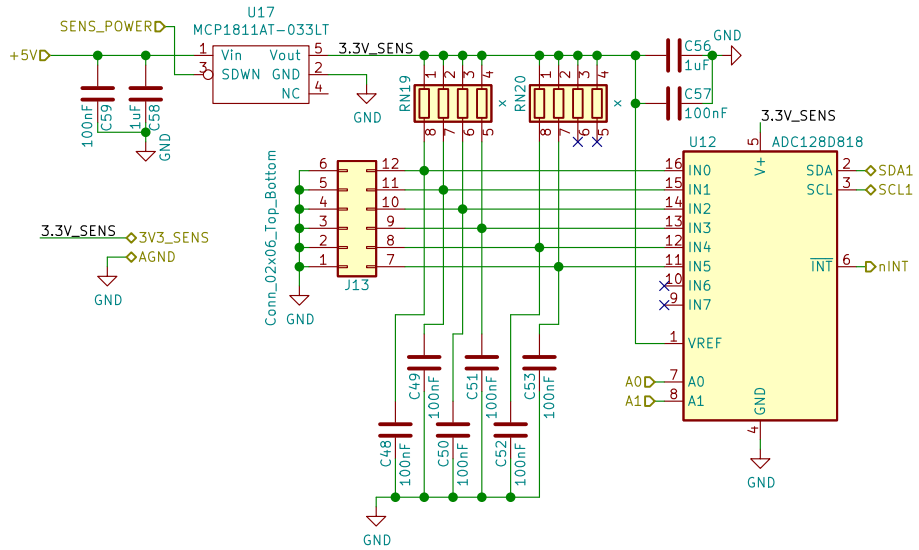
Title: Fenice BMS – CellBoard		
Size: A4	Date: 2021-06-11	**Rev:**
KiCad E.D.A. kicad 5.1.10		Id: 6/11



E-Agle TRT		
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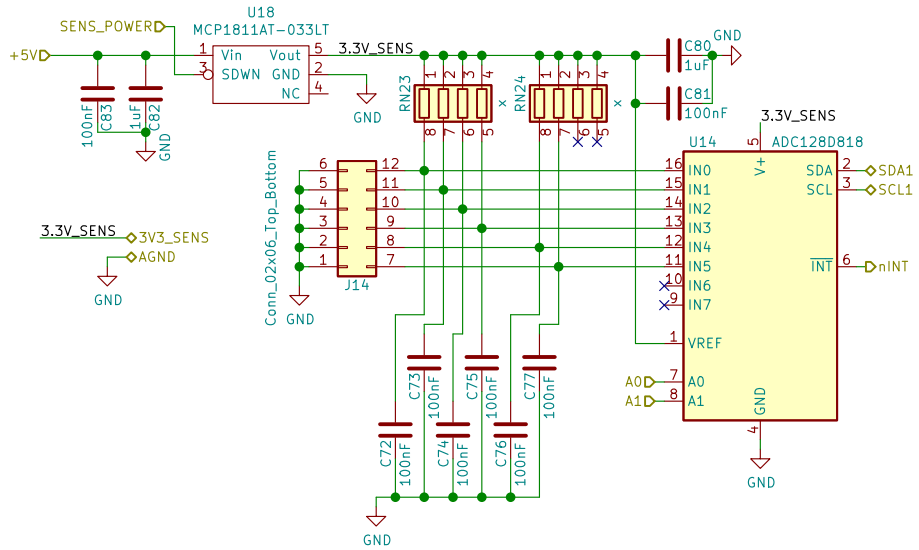
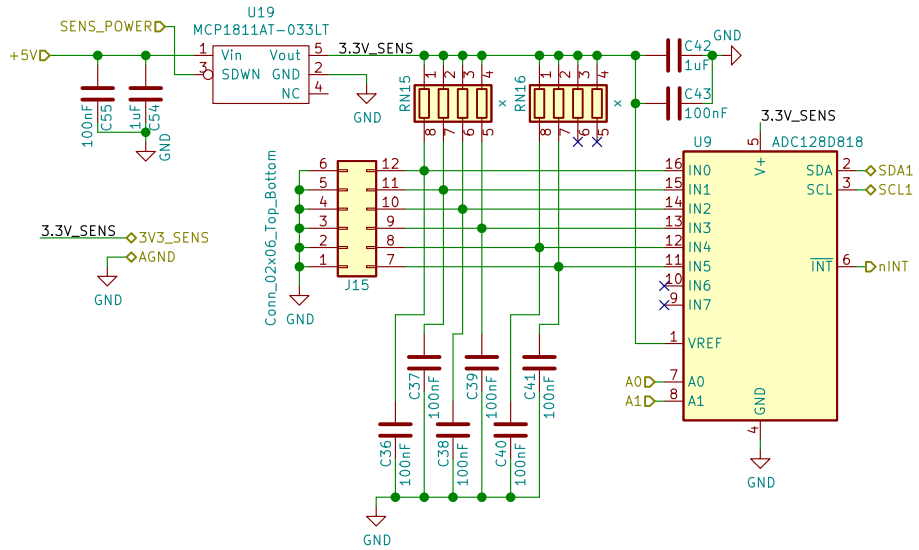
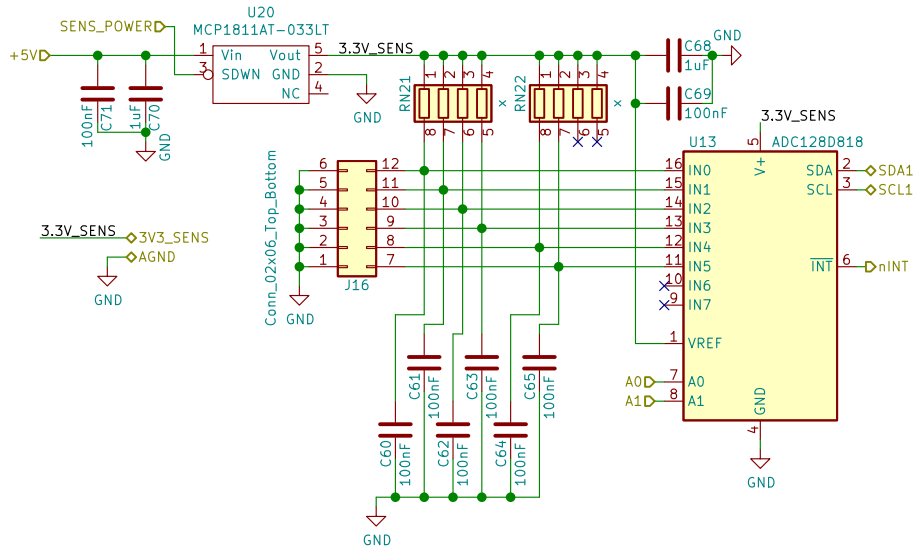
File: temperatureADC.sch		
Title: Fenice BMS – CellBoard		
Size: A4	Date: 2021-06-11	**Rev:**
KiCad E.D.A. kicad 5.1.10		Id: 7/11



E-Agle TRT		
Sheet: /BATTERY MANAGER/STM/temperatureADC_4/		
File: temperatureADC.sch		
Title: Fenice BMS – CellBoard		
Size: A4	Date: 2021-06-11	**Rev:**
KiCad E.D.A. kicad 5.1.10		Id: 8/11



E-Agle TRT		
Sheet: /BATTERY MANAGER/STM/temperatureADC_5/		
File: temperatureADC.sch		
Title: Fenice BMS – CellBoard		
Size: A4	Date: 2021-06-11	**Rev:**
KiCad E.D.A. kicad 5.1.10		Id: 9/11



E-Agle TRT		
Sheet: /BATTERY MANAGER/STM/temperatureADC_0/		
File: temperatureADC.sch		
Title: Fenice BMS – CellBoard		
Size: A4	Date: 2021-06-11	**Rev:**
KiCad E.D.A. kicad 5.1.10		Id: 10/11

PASSIVE DISCHARGE SELECTION
(power dissipation 2512=3W)

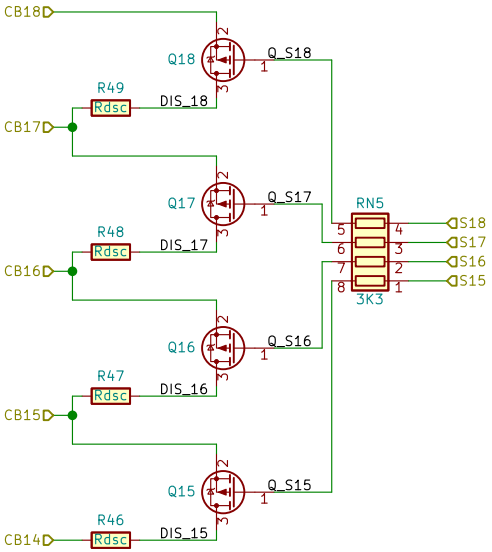
SINGLE RESISTOR			
V_{max} [V]	$I_{discharge}$ [A]	R [ohm]	P on R [W]
4,25	0,090	47	0,384308511
	0,109	39	0,463141026
	0,213	20	0,903125
	0,425	10	1,80625

DUAL RESISTOR			
V_{max} [V]	$I_{discharge}$ [A]	R [ohm]	P on R [W]
4,25	0,181	47	0,3843085
	0,218	39	0,463141
	0,425	20	0,903125
	0,567	15	1,2041667
	0,708	12	1,5052083
	0,850	10	1,80625
	1,037	8,2	2,2027439

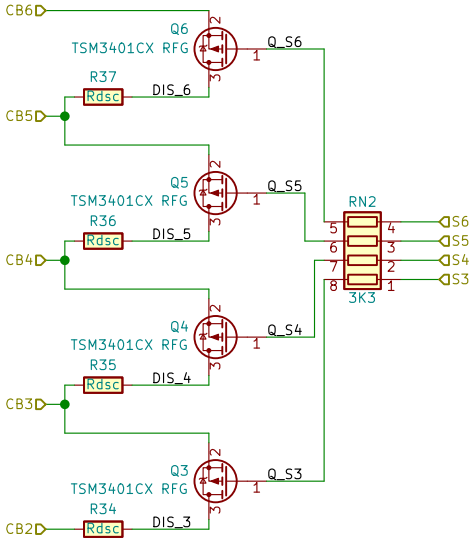
SINGLE RESISTOR = POPULATE ONLY THE RESISTOR FROM R1 TO R18

DUAL RESISTOR = POPULATE THE RESISTOR FROM R1 TO R18 + FROM R32 TO R49

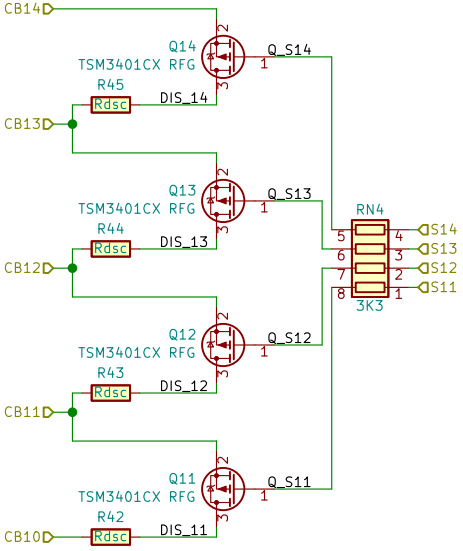
DISCHARGE OF CELL 18,17,16,15



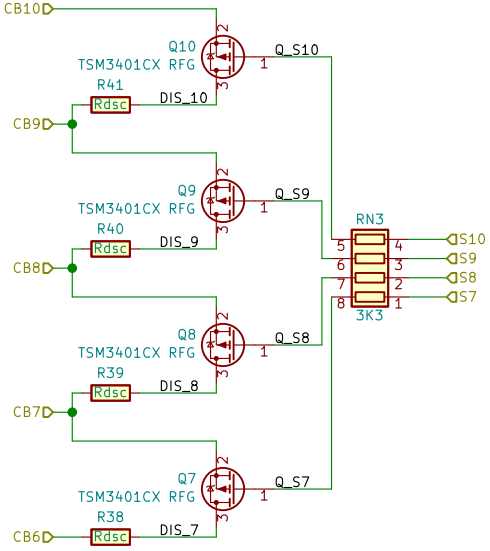
DISCHARGE OF CELL 6,5,4,3



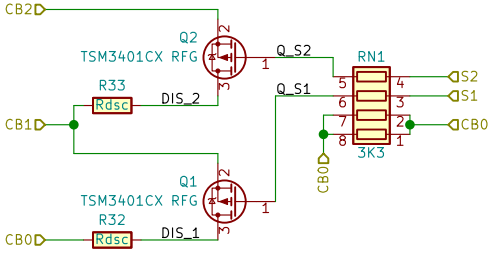
DISCHARGE OF CELL 14,13,12,11



DISCHARGE OF CELL 10,9,8,7



DISCHARGE OF CELL 2,1



E-Agle TRT

Sheet: /MOS_Balancer_Passive_metod/

File: Balance.sch

Title: Fenice BMS – CellBoard

Size: A4	Date: 2021-06-11	**Rev:**
KiCad E.D.A. kicad 5.1.10		Id: 11/11