

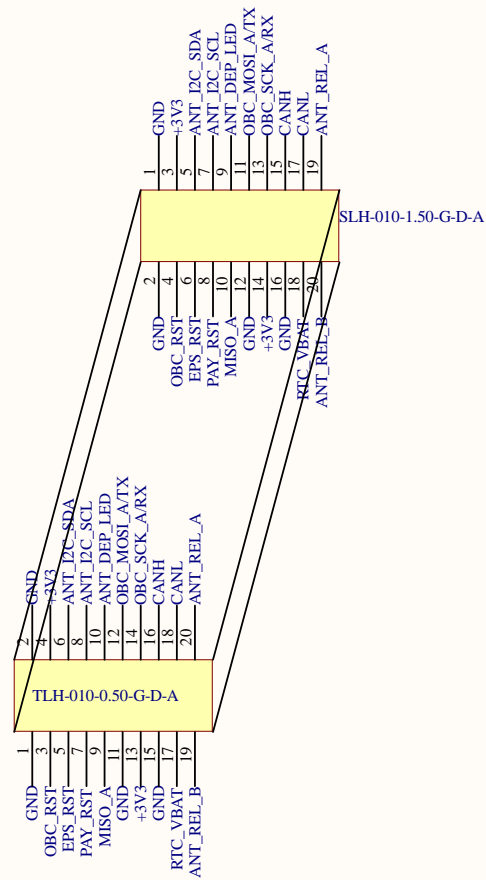
OBC PCB

View looking down through the TOP of
OBC

EPS PCB

View looking from the TOP of the
satellite DOWN

Satellite +Y Face

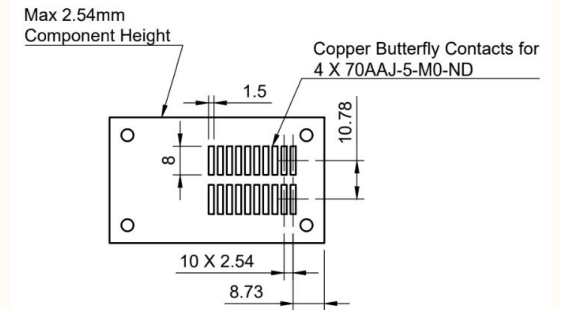


SLH-010-1.50-G-D-A

TLH-010-0.50-G-D-A

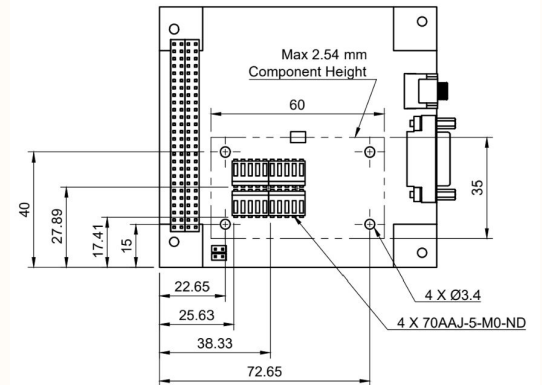
Satellite +X Face

[OLD] V2 Interface Drawings



OBC
(BOTTOM VIEW)

Butterfly Connector (70AAJ-5-M0-ND)
5x1 pins per connector, 2x2 connectors, 10x2 pins total
Note use of the 5-pin variant (4-pin is shown in datasheet)

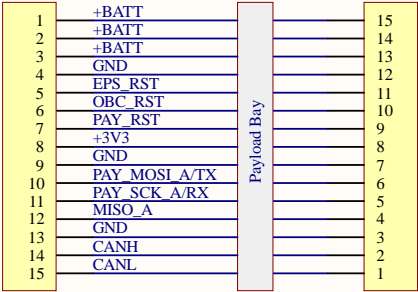


OBC Interfacing
(TOP VIEW)

Title		
EPS-OBC Interface		
Size	Number	Revision
A4	1	v1.8
Date:	2019-10-16	Sheet 1 of 8
File:	C:\Users\...\eps-obc.SchDoc	Drawn By: Jaden Reimer

EPS PCB

Hirose DF13 15-Pin Header:
<https://www.digikey.ca/product-detail/en/hirose-electric-co-ltd/DF13A-15-P-1.25H-21/H125988CT-ND/9489726>



PAY-SSM PCB

Hermetic connector (15 pins, Glenair 177-705H or 177-706H)
<https://www.datasheets360.com/pdf/2123725778547446062>

Premade wires (15 pins, 28 AWG)
Similar to <https://www.digikey.ca/short/j037h5>
Connections not flipped within cable's wires
Needs to be hand-crimped on the payload bay side for the hermic connector

Title		
EPS-PAY Interface		
Size	Number	Revision
A4	2	v1.8
Date:	2019-10-16	Sheet 2 of 8
File:	C:\Users\...\eps-pay.SchDoc	Drawn By: Jaden Reimer



Buffer needed on EPS for C and D gate signals

1	GND	1
2	MISO_A	2
3	EPS_MOSI_A/TX	3
4	EPS_SCK_A/RX	4
5	EPS_RST	5
6	OBC_MOSI_A/TX	6
7	OBC_SCK_A/RX	7
8	OBC_RST	8
9	PAY_MOSI_A/TX	9
10	PAY_SCK_A/RX	10
11	PAY_RST	11
12	CANH	12
13	CANL	13
14	ANT_I2C_SDA	14
15	ANT_I2C_SCL	15
16	C_GATE	16
17	D_GATE	17
18	ANT_REL_A	18
19	ANT_REL_B	19
20	GND	20
21	+3V3	21
22	+5V	22
23	DIS_TRANS_UART	23
24	+PACK	24
25	RTC_VBAT	25

Outside of satellite
Only for testing/debugging

DSUB-25 Connector

Spliced Cable
Connections are flipped within the cable's wires,
so the pin numbers match on both ends

Title			
EPS-SYS Interface			
Size	Number		Revision
A4	3		v1.8
Date:	2019-10-16		Sheet 3 of 8
File:	C:\Users\...\eps-sys_SchDoc		Drawn By: Jaden Reimer

Bus switch: TC7WB66CFK (active high output enable, US8 package)
<https://www.digikey.com/product-detail/en/toshiba-semiconductors-and-storage/TC7WB66CFKLF-CT/TC7WB66CFKLF-CTCT-ND/9866120>

2-pin header: 61300211121
<https://www.digikey.com/product-detail/en/wurth-electronics-inc/61300211121/732-5315-ND/4846823>

EPS PCB

Transceiver stacked on top of EPS PCB using header pins

Transceiver customized to use +5V supply, not +3.3V

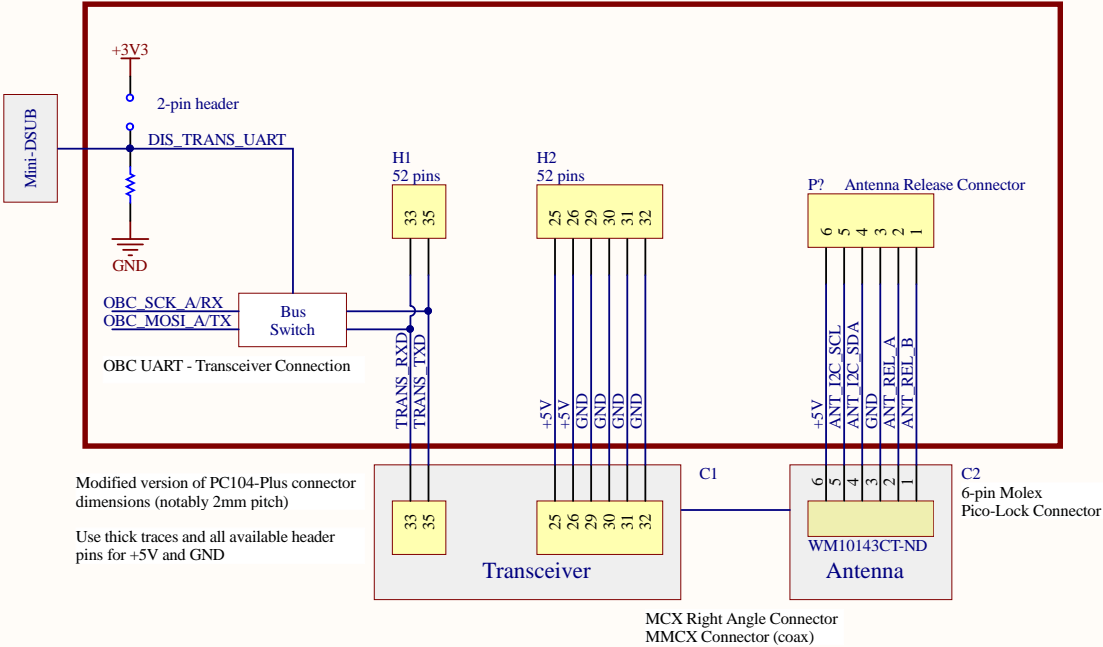
Comms signals routed from OBC through EPS board

WARNING: In UHF Manual and Protocol Rev. 2, the connector pinout diagram on p. 11, for each of H1 and H2, rows 1 and 2 are flipped i.e. H1 and H2 are placed correctly, but the bottom left in the image should be H1, pin 1, and the top left should be H2, pin 2

Header layout based on UHF_UTAT_Conn_Pinout.pdf (add En UHF Opt. and En UHF just in case)

RxD and TxD are the UART lines with respect to the transceiver (i.e. transceiver receives UART on RxD and transmits UART on TxD)

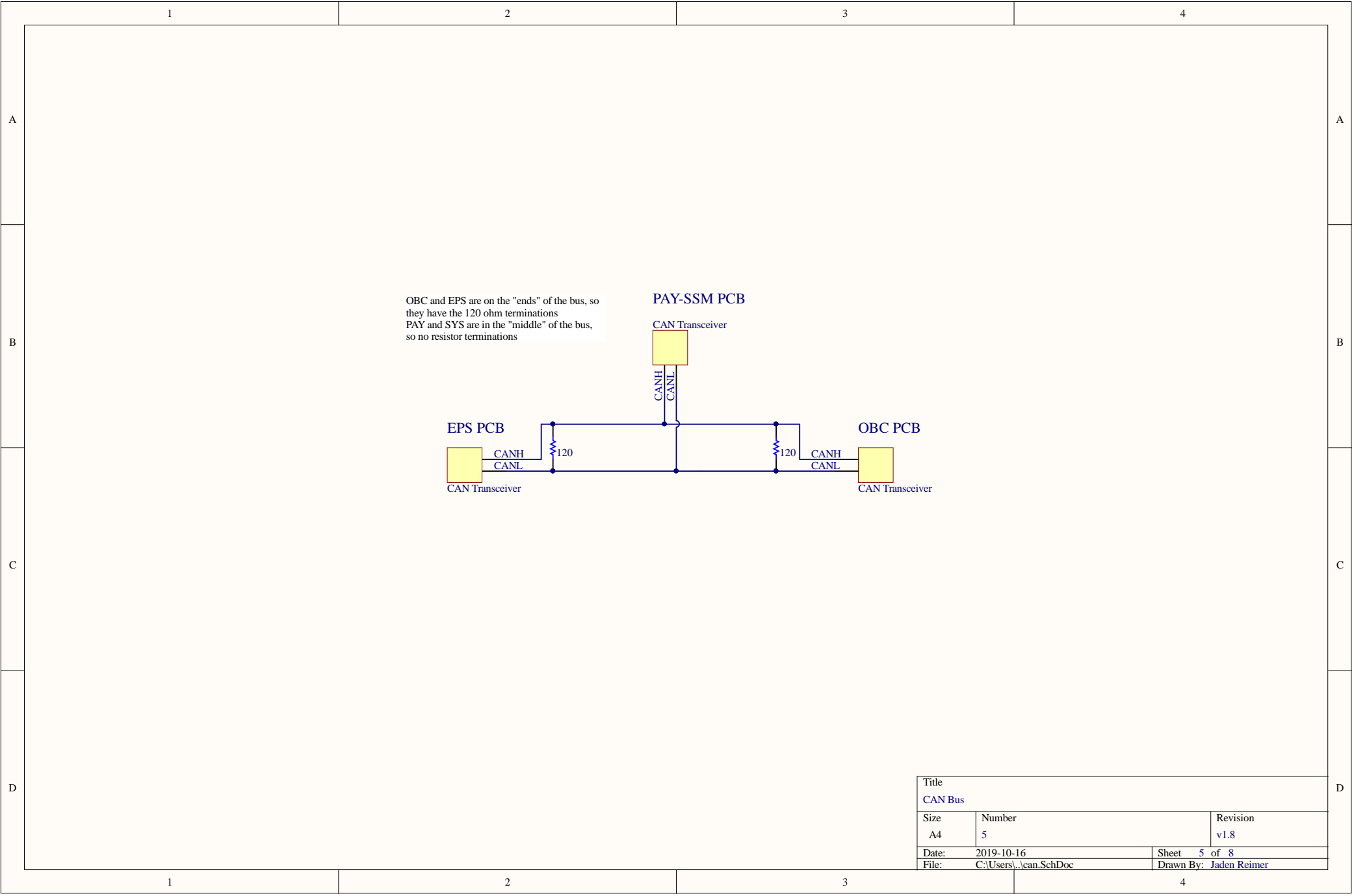
RELEASE_A and RELEASE_B can be used as Antenna Deployment GPIO from OBC



Modified version of PC104-Plus connector dimensions (notably 2mm pitch)

Use thick traces and all available header pins for +5V and GND

Title		
Communications		
Size	Number	Revision
A4	4	v1.8
Date:	2019-10-16	Sheet 4 of 8
File:	C:\Users\...\com.SchDoc	Drawn By: Jaden Reimer



Title		
CAN Bus		
Size	Number	Revision
A4	5	v1.8
Date:	2019-10-16	Sheet 5 of 8
File:	C:\Users\...\can.SchDoc	Drawn By: Jaden Reimer

2-Pos Right Angle Battery Connector
 Samtec SAM9552-ND:
<https://www.digikey.ca/products/en?keywords=sam9552-nd>

Flight model connectors should have gold mating finish

Load switch: TPS22959DNYT

Trace width calculator:
<https://www.4pcb.com/trace-width-calculator.html>

+BATT is the raw voltage across the battery pack
 (ignoring connection to EPS)

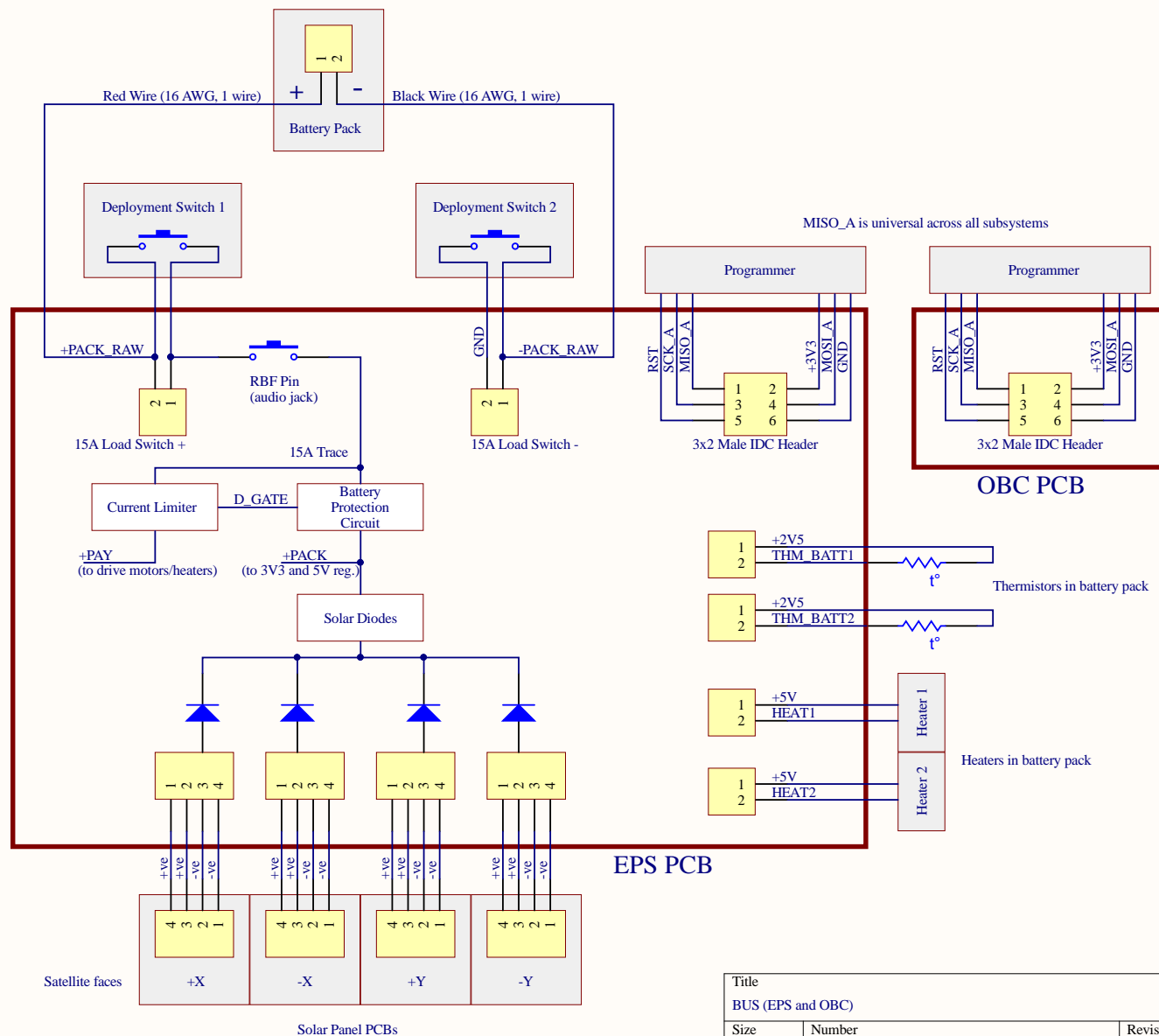
+PACK is the voltage from the battery pack to the EPS
 board (after deployment switches and RBF pin)

If the battery pack is connected to the EPS electronics
 (i.e. DS1, DS2, RBF all connected), +PACK = +BATT

If the battery pack is disconnected from the EPS
 electronics (i.e. one or more of DS1, DS2, RBF
 disconnected), +PACK = 0

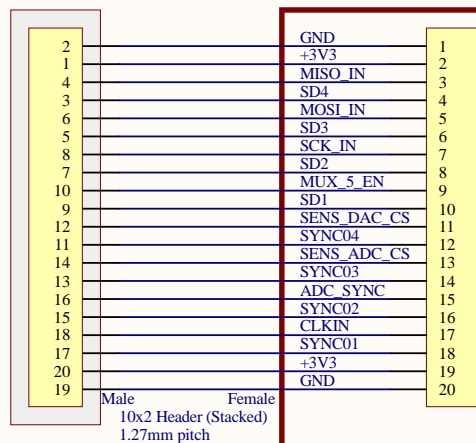
Protection Circuit Limits:
 Max charge = 4.190V, Charge release = 4.090V
 Max discharge = 2.70V, Discharge release = 3.00V

Absolute Maximum Battery Voltage Range: 2.5V-4.2V



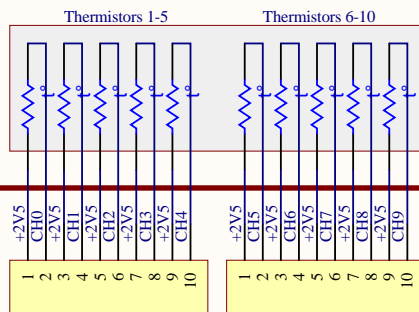
Title		
BUS (EPS and OBC)		
Size	Number	Revision
A4	6	v1.8
Date:	2019-10-16	Sheet 6 of 8
File:	C:\Users\...\bus.SchDoc	Drawn By: Jaden Reimer

PAY-Optical PCB (stacked on top of PAY-SSM)

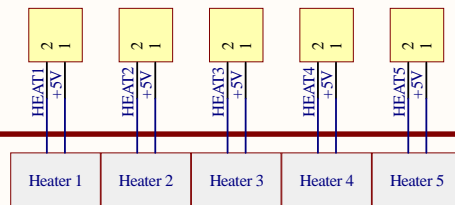


Start thermistor numbering from 0 to match ADC channel numbering

Thermistors (in microfluidics chips)

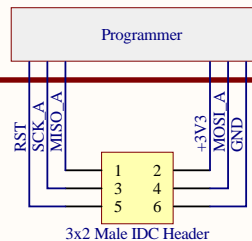


PAY-SSM PCB

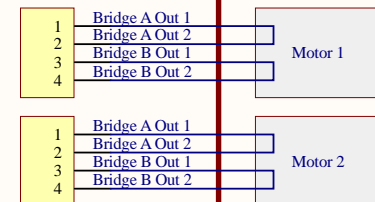
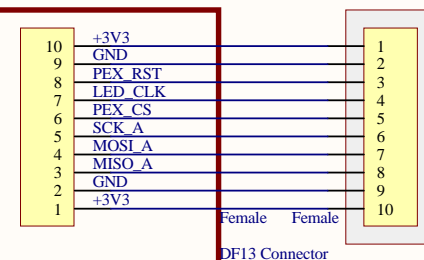


2-pin DF13 connector:
<https://www.digikey.ca/product-detail/en/hirose-electric-co-ltd/DF13A-2P-1.25H-21/H125743CT-ND/8594822>

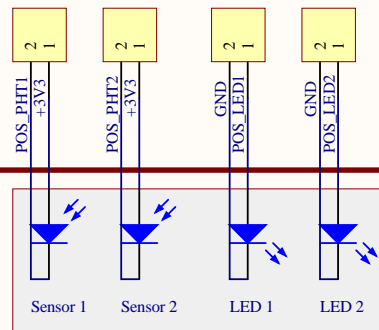
Flight model connectors should have gold mating finish



PAY-LED PCB (x2)



Actuation Plate Setup



Positioning - Photodiode Setup

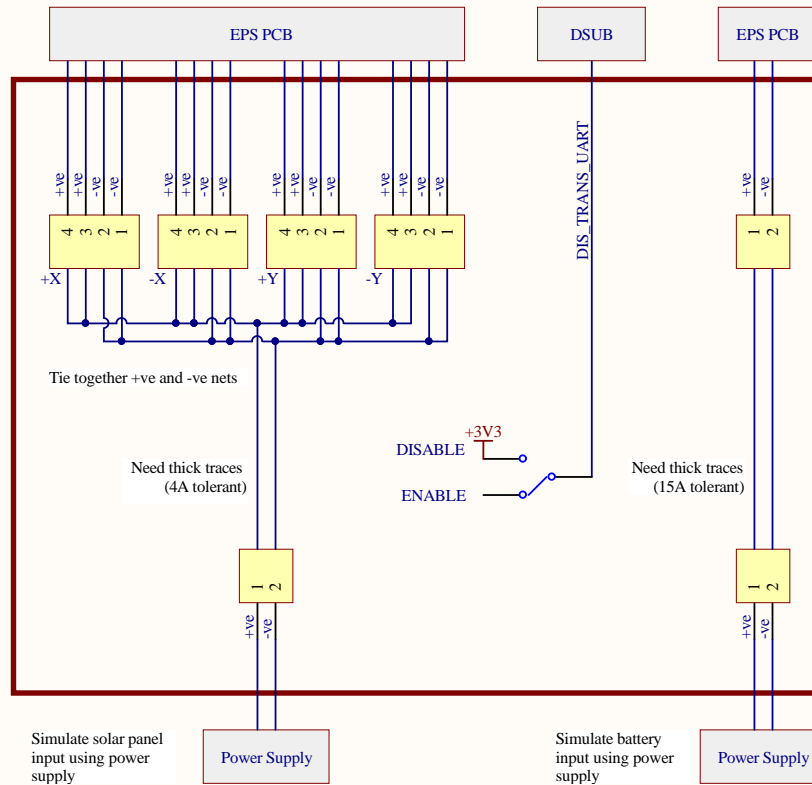
Title		
Payload		
Size	Number	Revision
A4	7	v1.8
Date:	2019-10-16	Sheet 7 of 8
File:	C:\Users\...\pay.SchDoc	Drawn By: Jaden Reimer

DF13 Connector: DF13A-4P-1.25H(21)
<https://www.digikey.ca/product-detail/en/hiro-se-electric-co-ltd/DF13A-4P-1.25H-21/H125082-CT-ND/5638961>

Flight model connectors should have gold mating finish

Screw terminal connector: 732-2028-ND
<https://www.digikey.ca/product-detail/en/wurth-electronics-inc/691102710002/732-2028-ND/2060524>

Physical UART disconnect switch: JS202011AQN (only need to connect 2 of its pins)
<https://www.digikey.ca/products/en?keywords=JS202011AQN>



Samtec IPBT Power Mate (16AWG power connector)
<https://www.digikey.ca/product-detail/en/samtec-inc/IPBT-102-H1-T-S-RA-K/SAM9552-ND/6678289>

Flight model connectors should have gold mating finish

Screw terminal connector: 732-2028-ND
<https://www.digikey.ca/product-detail/en/wurth-electronics-inc/691102710002/732-2028-ND/2060524>

Systems PCB

Title Systems (Debugging)		
Size A4	Number 8	Revision v1.8
Date:	2019-10-16	Sheet 8 of 8
File:	C:\Users\...\sys.SchDoc	Drawn By: Jaden Reimer