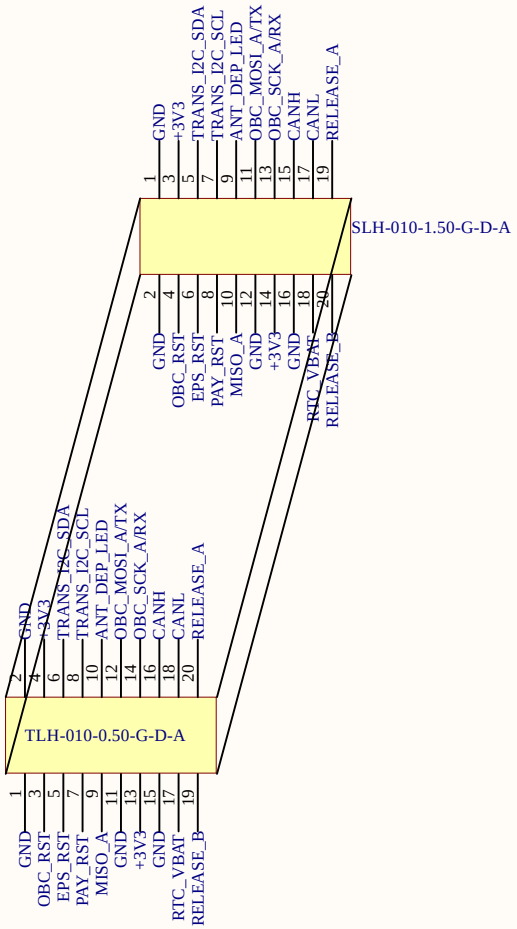
## Satellite +Y Face

### OBC PCB

View looking down through the TOP of OBC

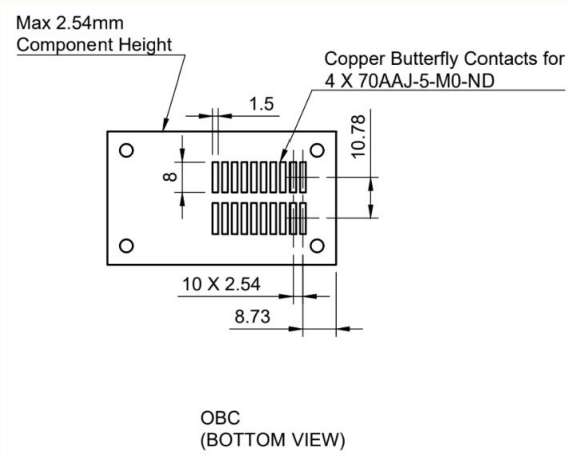
### EPS PCB

View looking from the TOP of the satellite DOWN

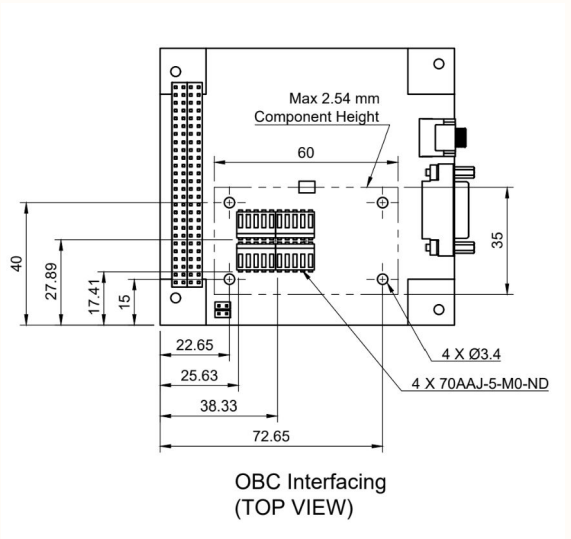



## Satellite +X Face

## [OLD] V2 Interface Drawings



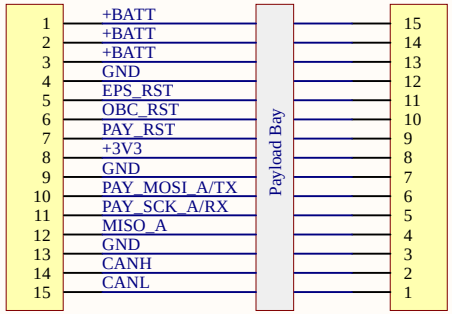

Butterfly Connector (70AAJ-5-M0-ND)
5x1 pins per connector, 2x2 connectors, 10x2 pins total
Note use of the 5-pin variant (4-pin is shown in datasheet)




| | | |
|---|---|---|
| Title: EPS-OBC Interface | | |
| Size: A4 | Number: 1 | Revision: v1.5 |
| Date: 2019-07-29 | | 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-15P-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: A4 | Number: 2 | Revision: v1.5 |
| Date: 2019-07-29 | | Sheet 2 of 8 |
| File: C:\Users\..\eps-pay.SchDoc | | Drawn By: Jaden Reimer |

## EPS PCB

Mini DSUB-25 Connector

Buffer needed on EPS for C and D gate signals


## Systems PCB

Outside of satellite
Only for testing/debugging

DSUB-25 Connector

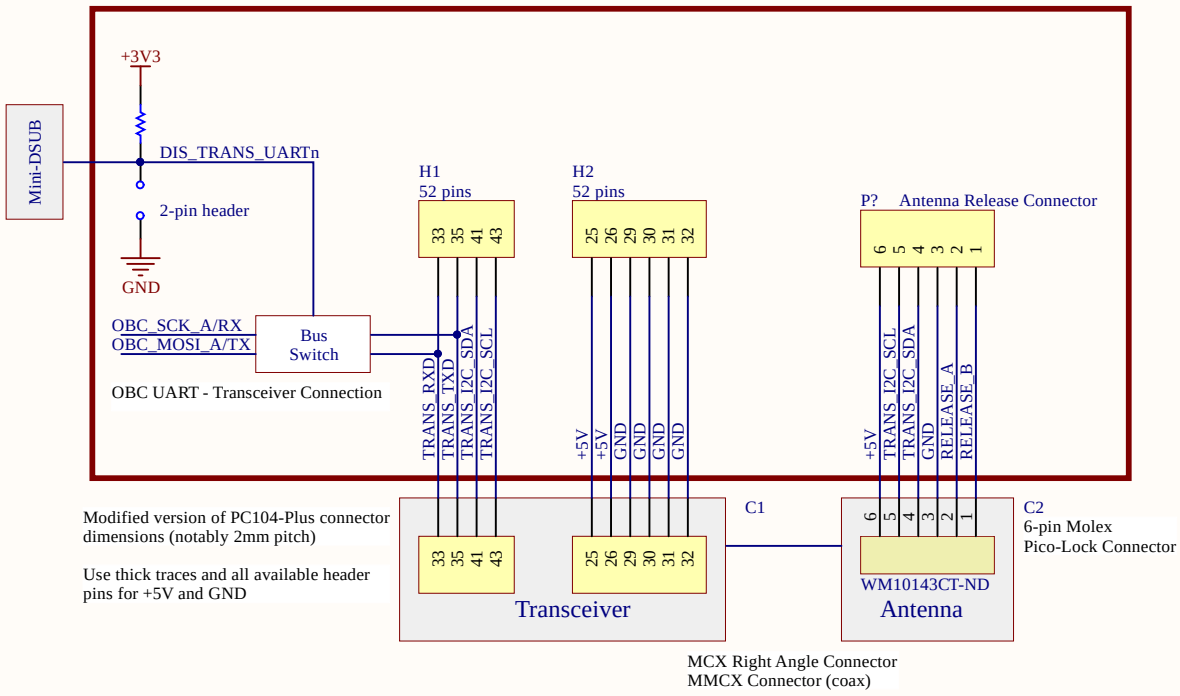
Spliced Cable
Connections are flipped within the cable's wires, so the pin numbers match on both ends

| | | |
|---|---|---|
| Title: EPS-SYS Interface | | |
| Size: A4 | Number: 3 | Revision: v1.5 |
| Date: 2019-07-29 | 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-semiconductor-and-storage/TC7WB66CFKLF-CT/TC7WB66FKLF-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

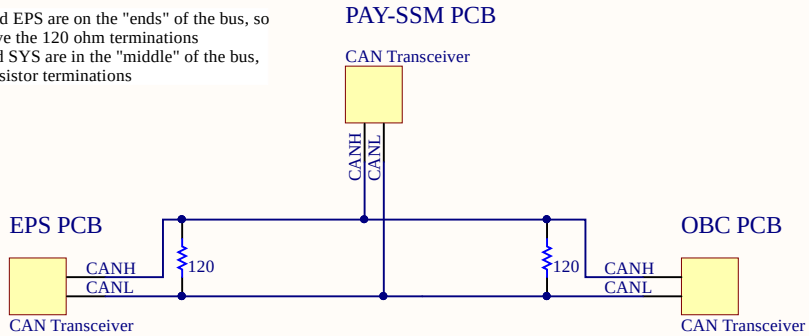
Modified version of PC104-Plus connector dimensions (notably 2mm pitch)

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

MCX Right Angle Connector
MMCX Connector (coax)

| | | |
|---|---|---|
| Title: Communications | | |
| Size: A4 | Number: 4 | Revision: v1.5 |
| Date: 2019-07-29 | | Sheet 4 of 8 |
| File: C:\Users\..\com.SchDoc | | Drawn By: Jaden Reimer |

OBC and EPS are on the "ends" of the bus, so they have the 120 ohm terminations
PAY and SYS are in the "middle" of the bus, so no resistor terminations




| | | |
|---|---|---|
| Title: CAN Bus | | |
| Size: A4 | Number: 5 | Revision: v1.5 |
| Date: 2019-07-29 | | 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)

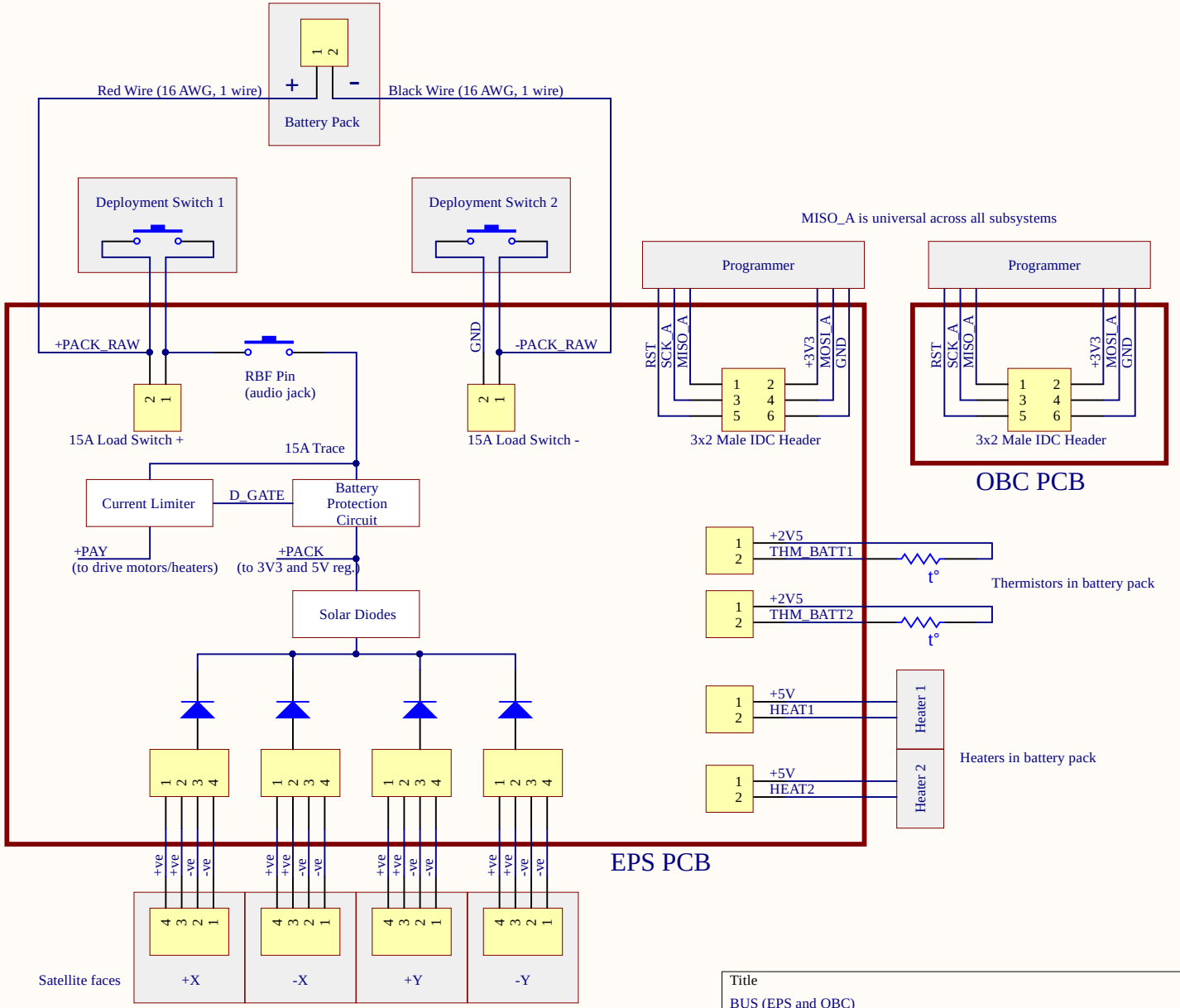
+PACK is the voltage from the battery pack to the EPS board (after deployment switches and RBF pin)

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

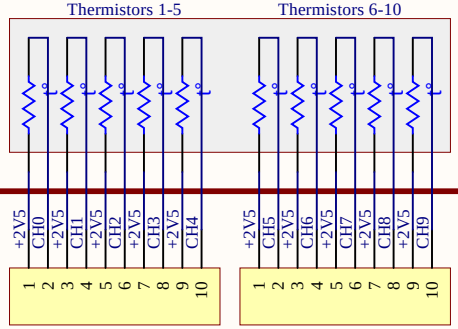



| | | |
|---|---|---|
| Title | BUS (EPS and OBC) | |
| Size: A4 | Number: 6 | Revision: v1.5 |
| Date: 2019-07-29 | | Sheet 6 of 8 |
| File: C:\Users\..\bus.SchDoc | | Drawn By: Jaden Reimer |

Start thermistor numbering from 0
to match ADC channel numbering

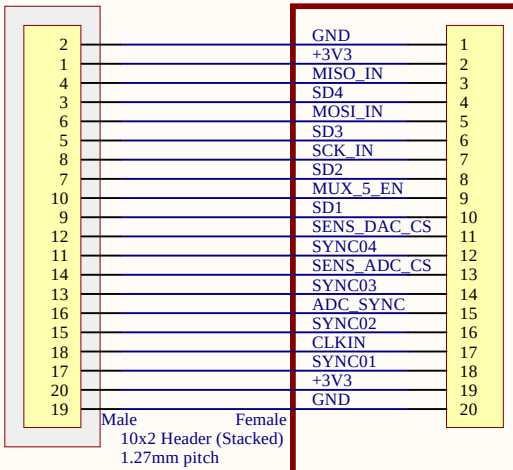
## Thermistors (in microfluidics chips)

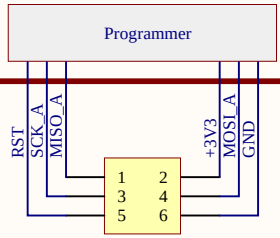
Thermistors 1-5 Thermistors 6-10



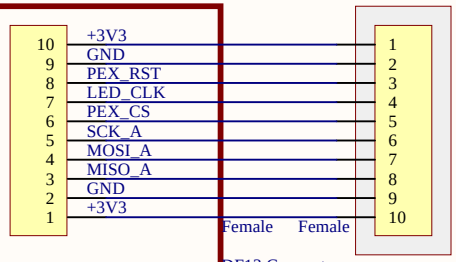

## PAY-Optical PCB

(stacked on top of PAY-SSM)




## PAY-LED PCB (x2)




## PAY-SSM PCB












Actuation Plate Setup

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

Positioning - Photodiode Setup

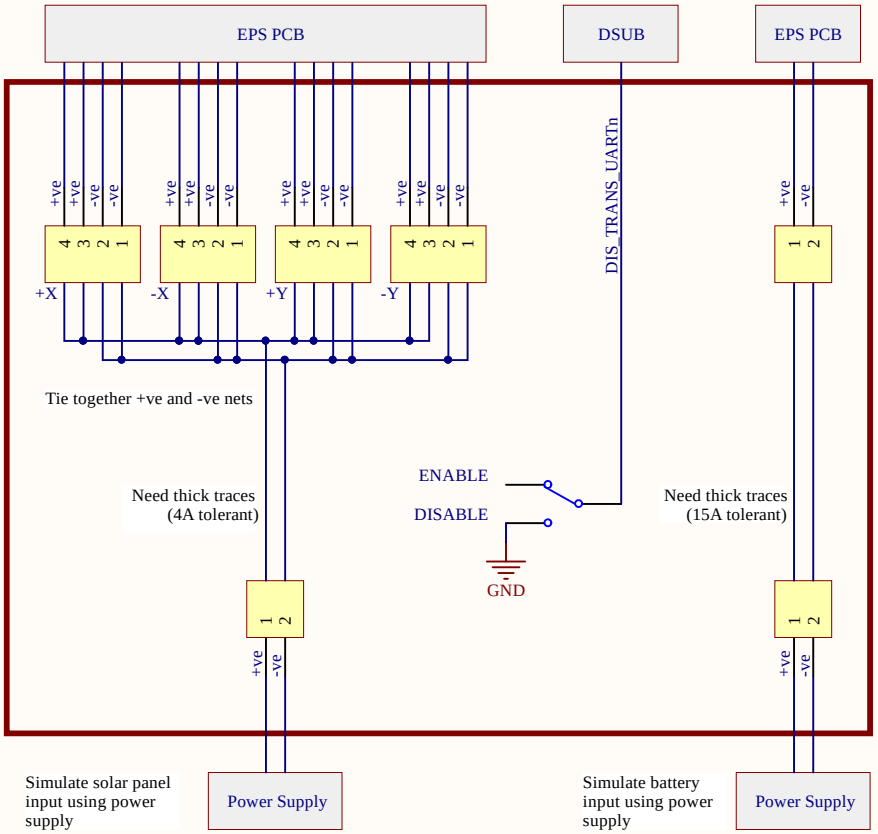
| | | |
|---|---|---|
| Title: Payload | | |
| Size: A4 | Number: 7 | Revision: v1.5 |
| Date: 2019-07-29 | | Sheet 7 of 8 |
| File: C:\Users\..\pay.SchDoc | | Drawn By: Jaden Reimer |

DF13 Connector: DF13A-4P-1.25H(21)
https://www.digikey.ca/product-detail/en/hirose-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: v1.5 |
| Date: 2019-07-29 | | Sheet 8 of 8 |
| File: C:\Users\..\sys.SchDoc | | Drawn By: Jaden Reimer |