

MCAT-4CU-B  
Micro-Cathode Arc Thruster Subsystem  
4-Channel Unit Controller PCB  
Rev. 2K2 | Datecode 201410140925  
Warning: Access restricted to permitted users only.  
Subject to applicable ITAR regulations, if any.

Designer: Samudra N3RDX, G19124781  
Designer Contact: (202) 812-3325  
4-layer PCB, 0.062 inches (1.5748 mm), double sided construction.  
For use in US Naval Academy spacecraft BRICSat-P

Use in conjunction with MCAT-1C-TBT-xxx and MCAT-1C-TBB-xxx by TEEL

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## Cover Sheet

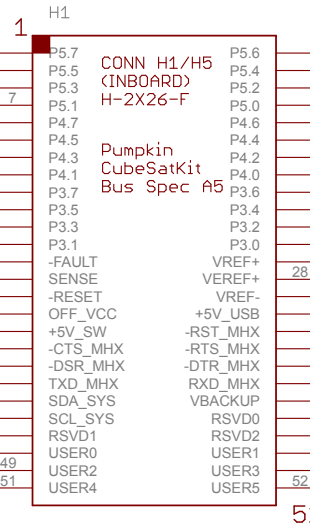
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Design: Samudra Haque, N3RDX, 2014  
Ph.D Candidate (Aerospace Engineering)  
Dept. of Mechanical and Aerospace Engineering  
The George Washington University  
(202) 812-3325



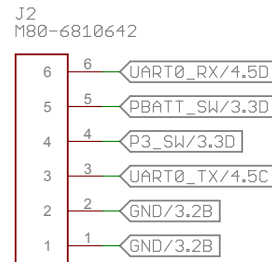
Rev 2K2 TO DO LIST

// I2C section incomplete //  
Missing +5V supply  
Missing Pullup resistors  
(2 x 10K resistors)  
[http://www.robot-electronics.co.uk/acatalog/I2C\\_Tutorial.html](http://www.robot-electronics.co.uk/acatalog/I2C_Tutorial.html)

// Incorrect pad for R31-R34 //  
ON PCB : Substitute (temp.) part CRL1206-FW-R100ELF 0.1R/0.25W 1% 1206 SMD

// FIX COMPONENT PIN #1 OUTLINES //  
Q1-Q8 lacks orientation mark.

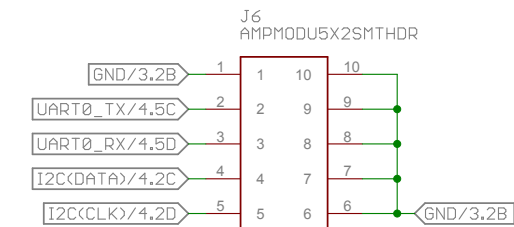
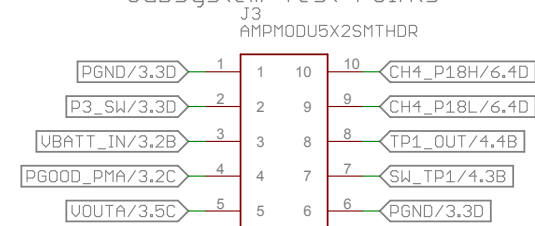
Connections  
to/from BricSat-P Bus



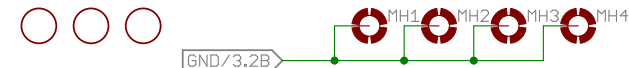
Section Names:

CU - Control Unit  
PM - Power Management  
PD - Power Distribution  
I/F - Interface  
TU - Thruster /PPU PCB Upper  
TL - Thruster/PPU PCB Lower

Subsystem Test Points



FIDUCIALS FOR PCB PICK AND PLACE Bus Frame Mounting Holes  
Do Not Delete from schematic Do Not Delete from schematic



I/F - CubeSatKit Bus Interface Section

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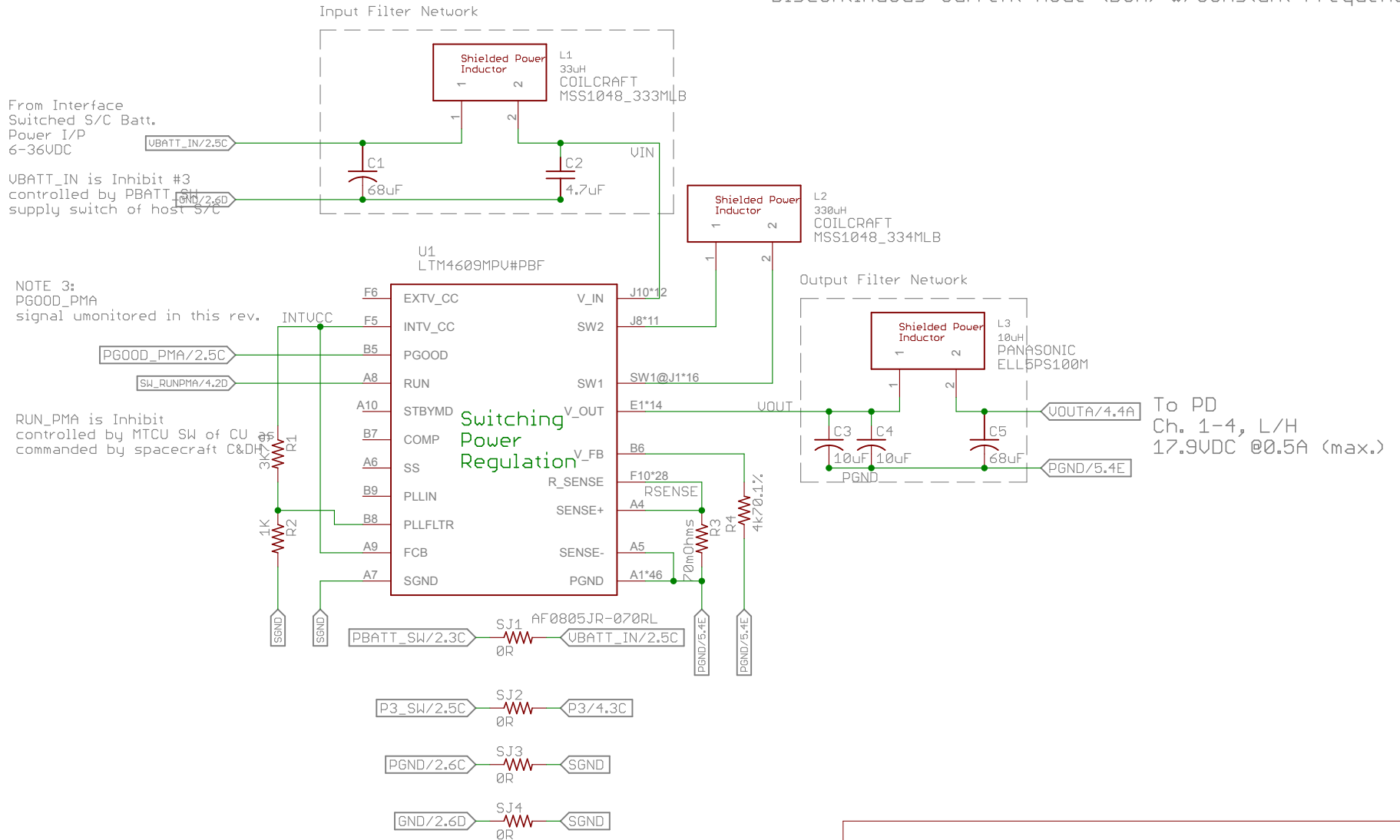
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Switching Regulator  
 $f = 300 \text{ kHz}$   
 Input = 6-36VDC (nom @7.2V, 1.56A)  
 Output = 17.82VDC (@17.82VDC, 0.5A, max.)  
 Ripple = 0.05 mVpp  
 Discontinuous Current Mode (DCM) w/Constant Frequency



## PM - Power Management

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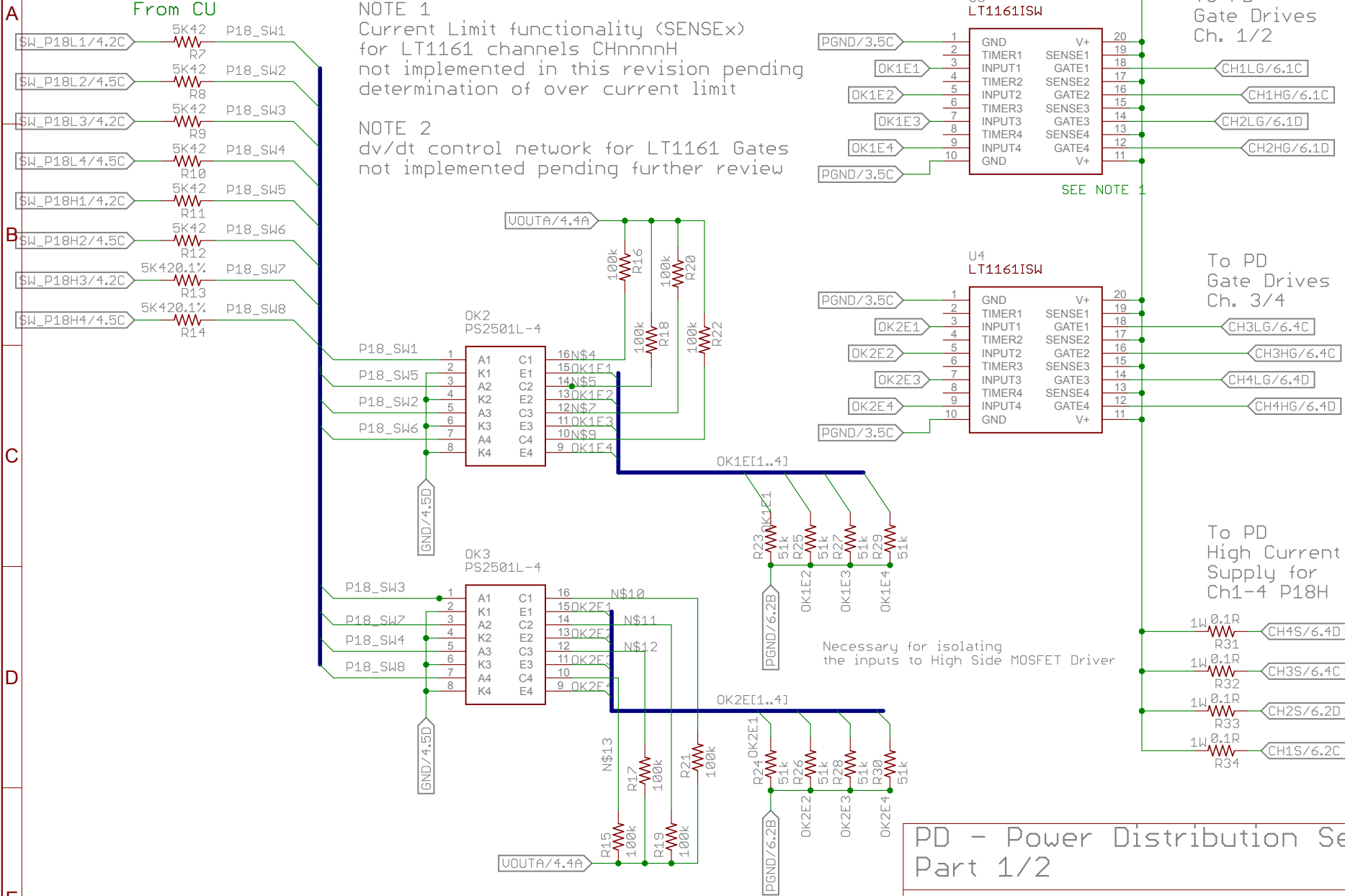


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From CU

NOTE 1  
Current Limit functionality (SENSE<sub>x</sub>)  
for LT1161 channels CH<sub>nnnn</sub>H  
not implemented in this revision pending  
determination of over current limit

NOTE 2  
dv/dt control network for LT1161 Gates  
not implemented pending further review



## PD - Power Distribution Section Part 1/2

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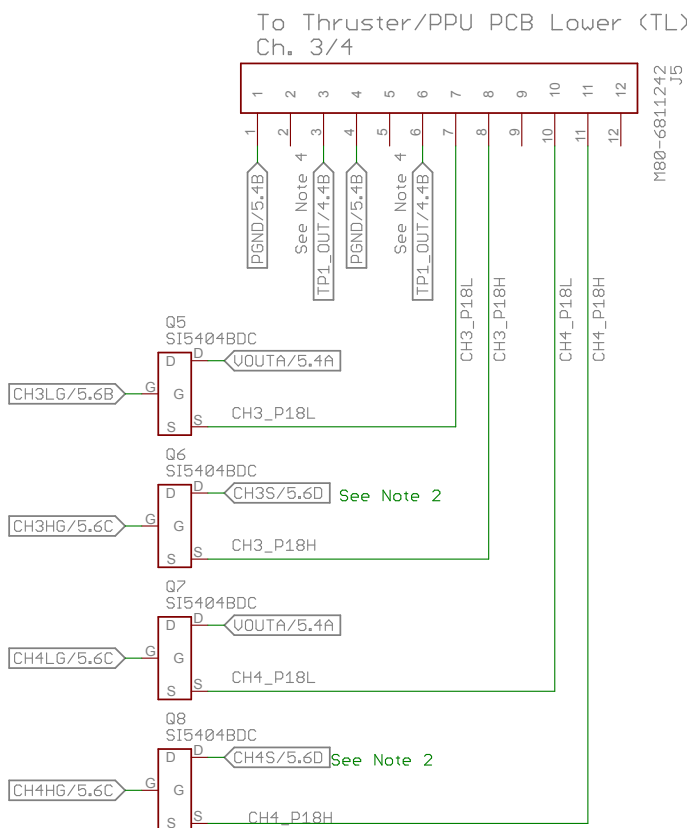
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