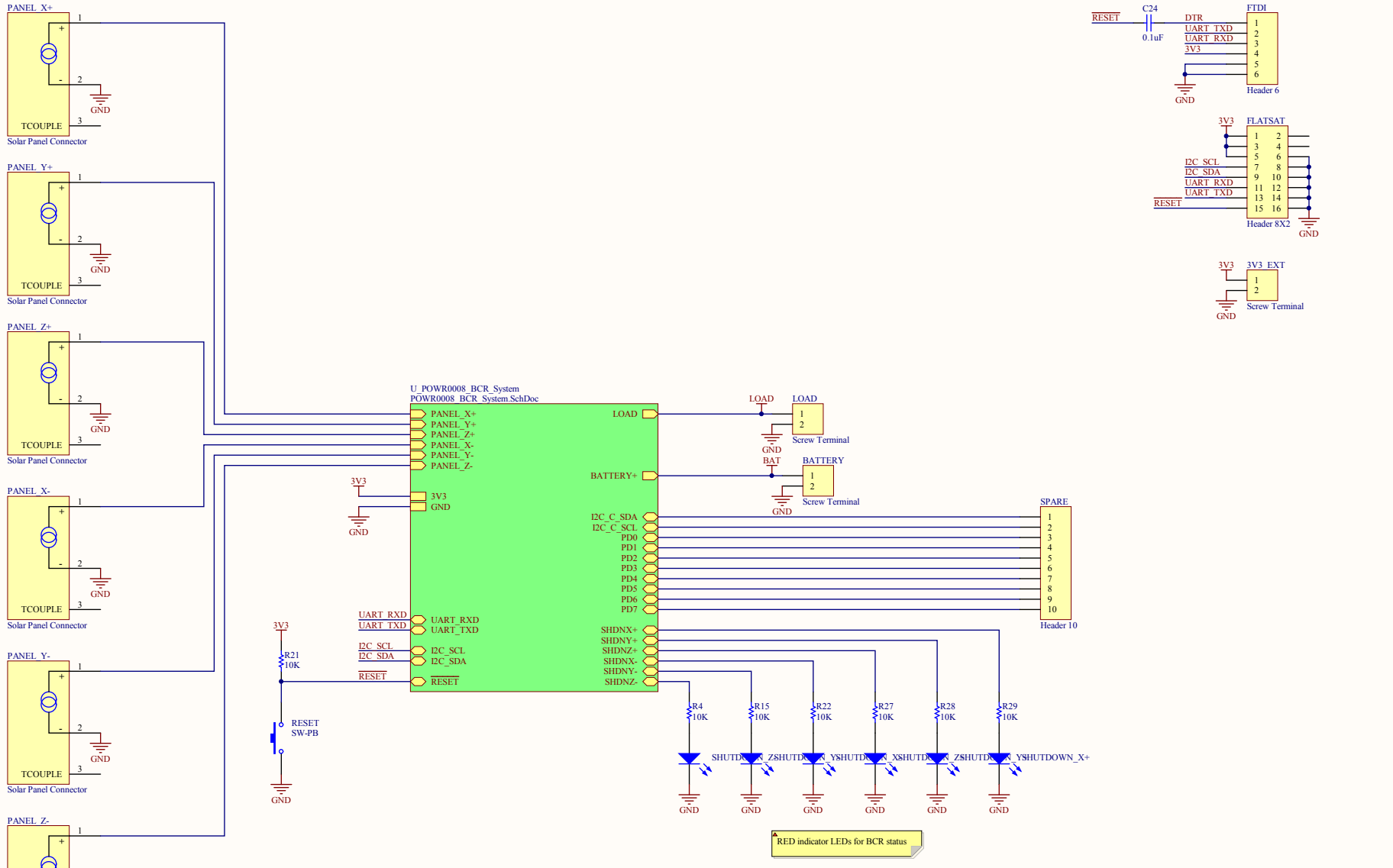


| | | |
|---|---|---|
| Title | ***Battery charge regulator prototype board*** | |
| Description: | FLATSAT prototype PCB of BCR subsystem | |
| Author: Thomas Fisk | Drawing No.: POWR0010 | |
| Size: A3 | Version 1.0 | |
| Date: 10/07/2012 Time: 11:36:38 AM | Sheet: 1 of 1 | |
| File: C:\Users\Thomas\Desktop\BCR Fork\July 2012 Revision\POWR0010_BCR_TESTBOARD.SchDoc | | |

*BLUEsat Project*
*Room 419*
*School of EE&T*
*UNSW, NSW 2052*
*Australia*

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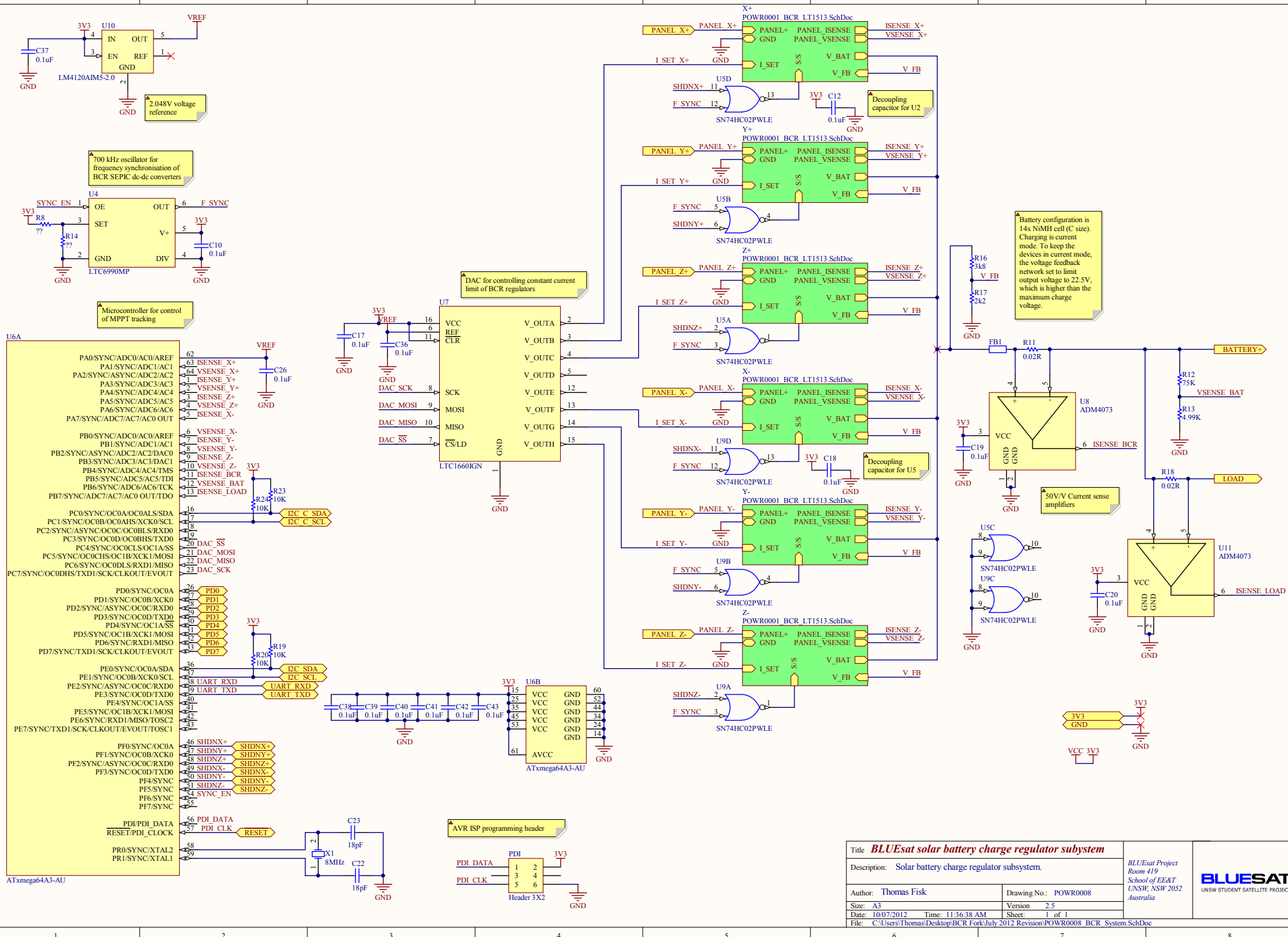
LM4120AIM5-2.0
2.048V voltage reference
700 kHz oscillator for frequency synchronisation of BCR SEPIC dc-dc converters
LTC6990MP
Microcontroller for control of MPPT tracking
ATxmega64A3-AU
DAC for controlling constant current limit of BCR regulators
LTC1660IGN
POWR0001_BCR_LT1513.SchDoc
SN74HC02PWLE
Decoupling capacitor for U2
Decoupling capacitor for U5
Battery configuration is 14x NiMH cell (C size). Charging is current mode. To keep the devices in current mode, the voltage feedback network set to limit output voltage to 22.5V, which is higher than the maximum charge voltage.
ADM4073
50V/V Current sense amplifiers
ATxmega64A3-AU
AVR ISP programming header
Header 3X2
Title BLUEsat solar battery charge regulator subystem
Description: Solar battery charge regulator subsystem.
Author: Thomas Fisk
Drawing No.: POWR0008
Size: A3
Version 2.5
Date: 10/07/2012 Time: 11:36:38 AM
Sheet: 1 of 1
File: C:\Users\Thomas\Desktop\BCR Fork\July 2012 Revision\POWR0008_BCR_System.SchDoc
BLUEsat Project Room 419 School of EE&T UNSW, NSW 2052 Australia
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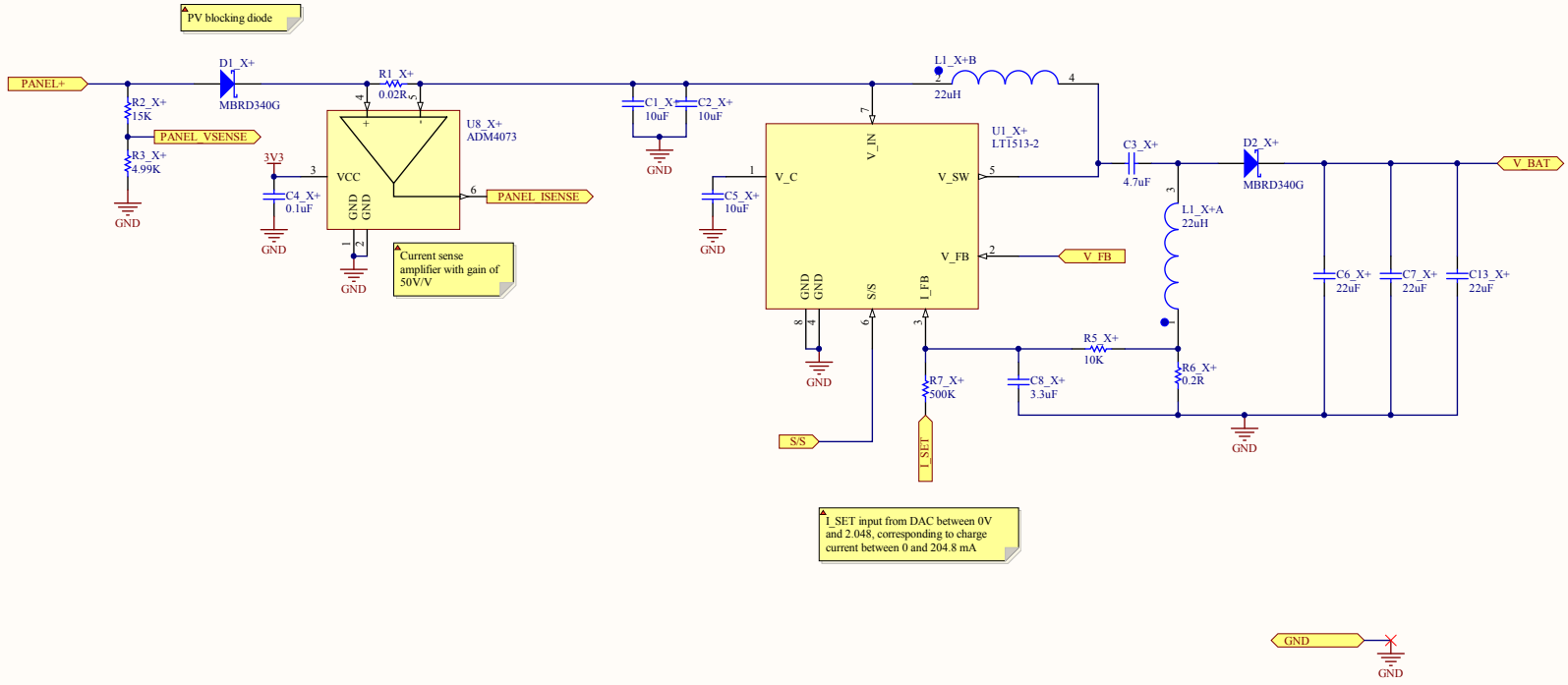


| | | |
|---|---|---|
| Title | ***BLUEsat Battery Charge Regulator*** | *BLUEsat Project Room 419 School of EE&T UNSW, NSW 2052 Australia* |
| Description: | SEPIC battery charge regulator with variable current control | |
| Author: Thomas Fisk | Drawing No.: POWR0001 | |
| Size: A3 | Version 4 | |
| Date: 10/07/2012 Time: 11:36:38 AM | Sheet: 1 of 1 | |
| File: C:\Users\Thomas\Desktop\BCR Fork\July 2012 Revision\POWR0001_BCR_LT1513.SchDoc | | |

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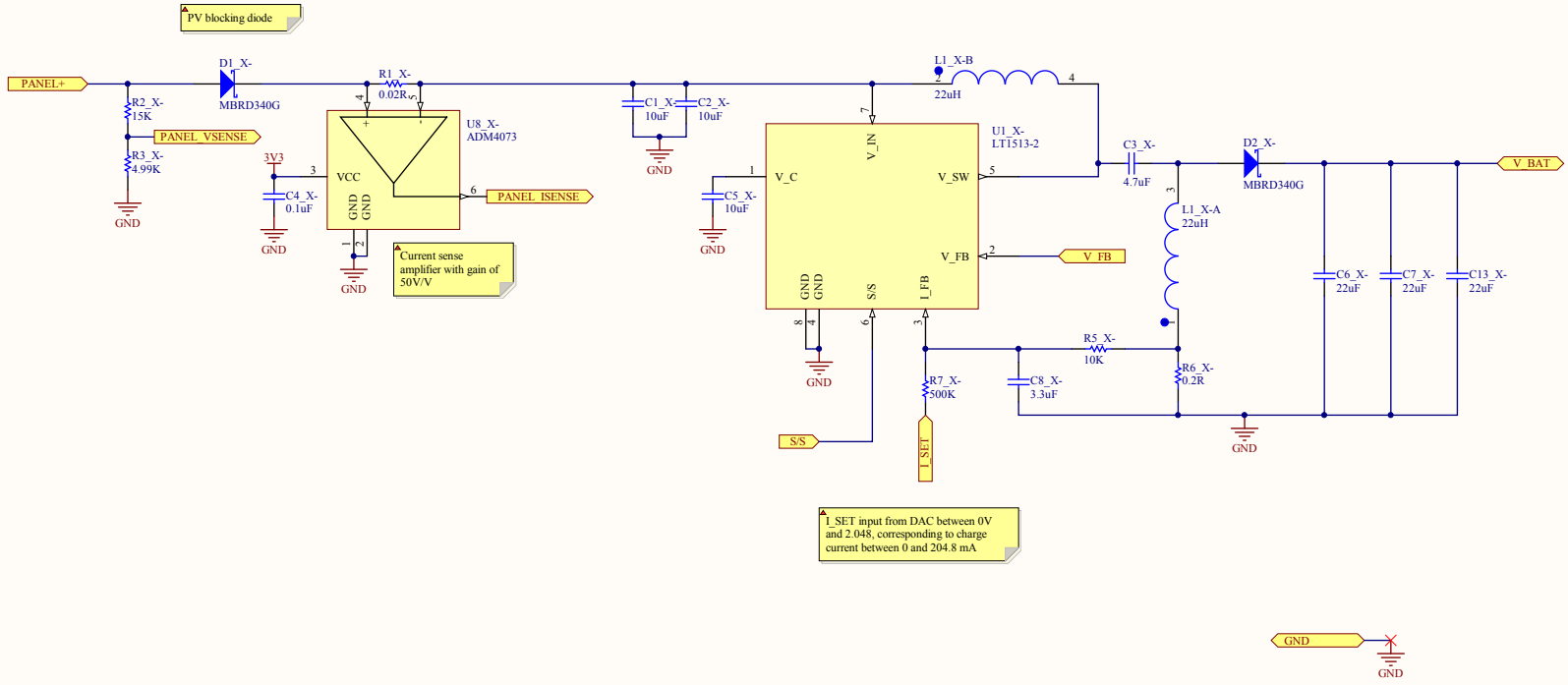


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| Size: A3 | Version 4 | |
| Date: 10/07/2012 Time: 11:36:38 AM | Sheet: 1 of 1 | |
| File: C:\Users\Thomas\Desktop\BCR Fork\July 2012 Revision\POWR0001_BCR_LT1513.SchDoc | | |

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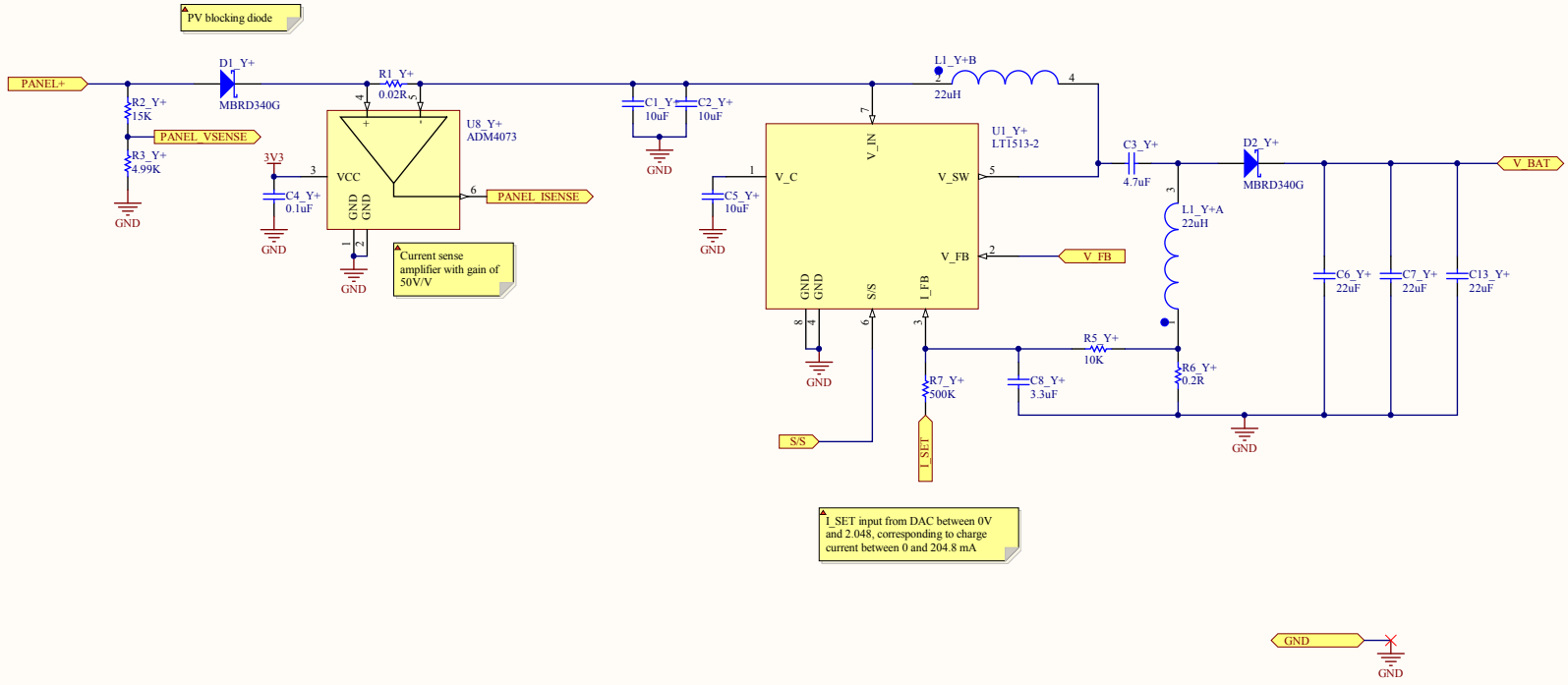


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| Title | ***BLUEsat Battery Charge Regulator*** | *BLUEsat Project Room 419 School of EE&T UNSW, NSW 2052 Australia* |
| Description: | SEPIC battery charge regulator with variable current control | |
| Author: Thomas Fisk | Drawing No.: POWR0001 | |
| Size: A3 | Version 4 | |
| Date: 10/07/2012 Time: 11:36:39 AM | Sheet: 1 of 1 | |
| File: C:\Users\Thomas\Desktop\BCR Fork\July 2012 Revision\POWR0001_BCR_LT1513.SchDoc | | |

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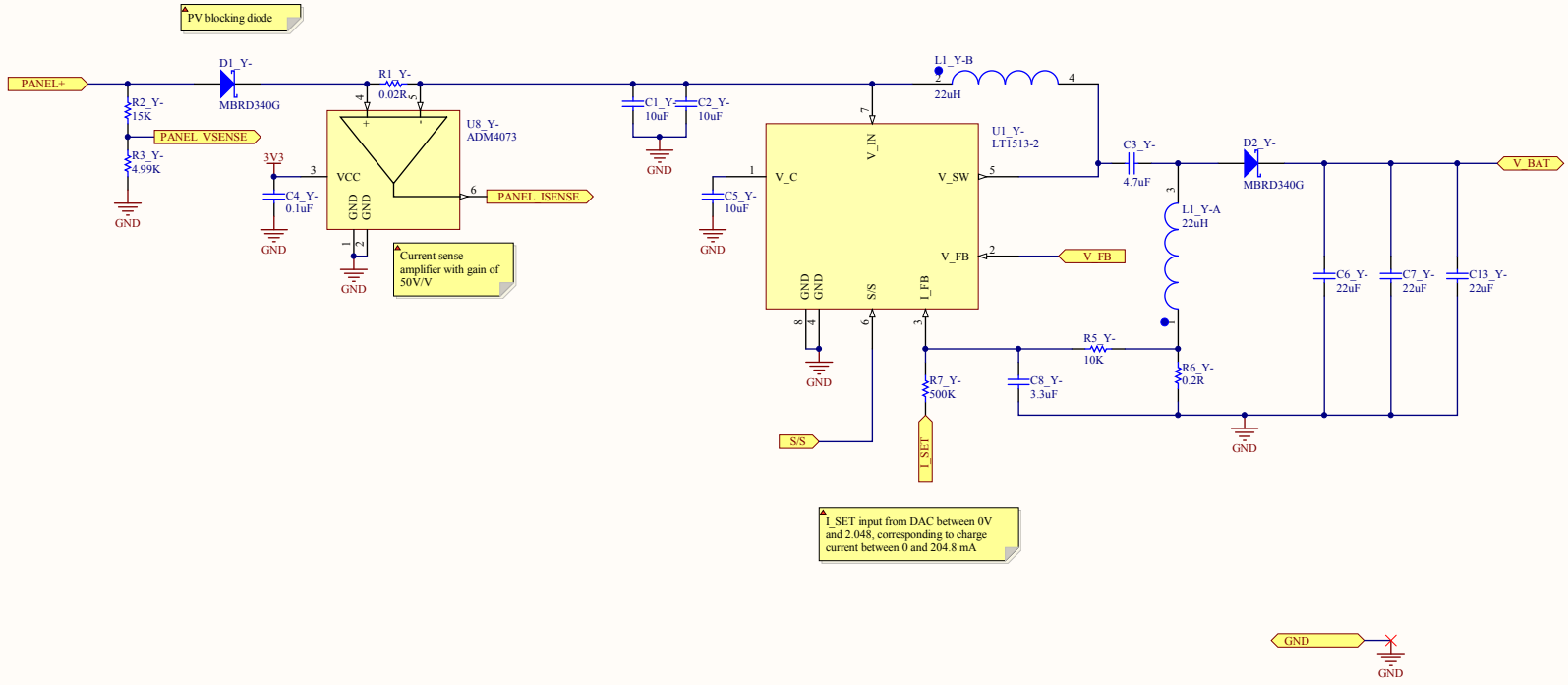


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| Title | ***BLUEsat Battery Charge Regulator*** | *BLUEsat Project Room 419 School of EE&T UNSW, NSW 2052 Australia* |
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| Size: A3 | Version 4 | |
| Date: 10/07/2012 Time: 11:36:39 AM | Sheet: 1 of 1 | |
| File: C:\Users\Thomas\Desktop\BCR Fork\July 2012 Revision\POWR0001_BCR_LT1513.SchDoc | | |

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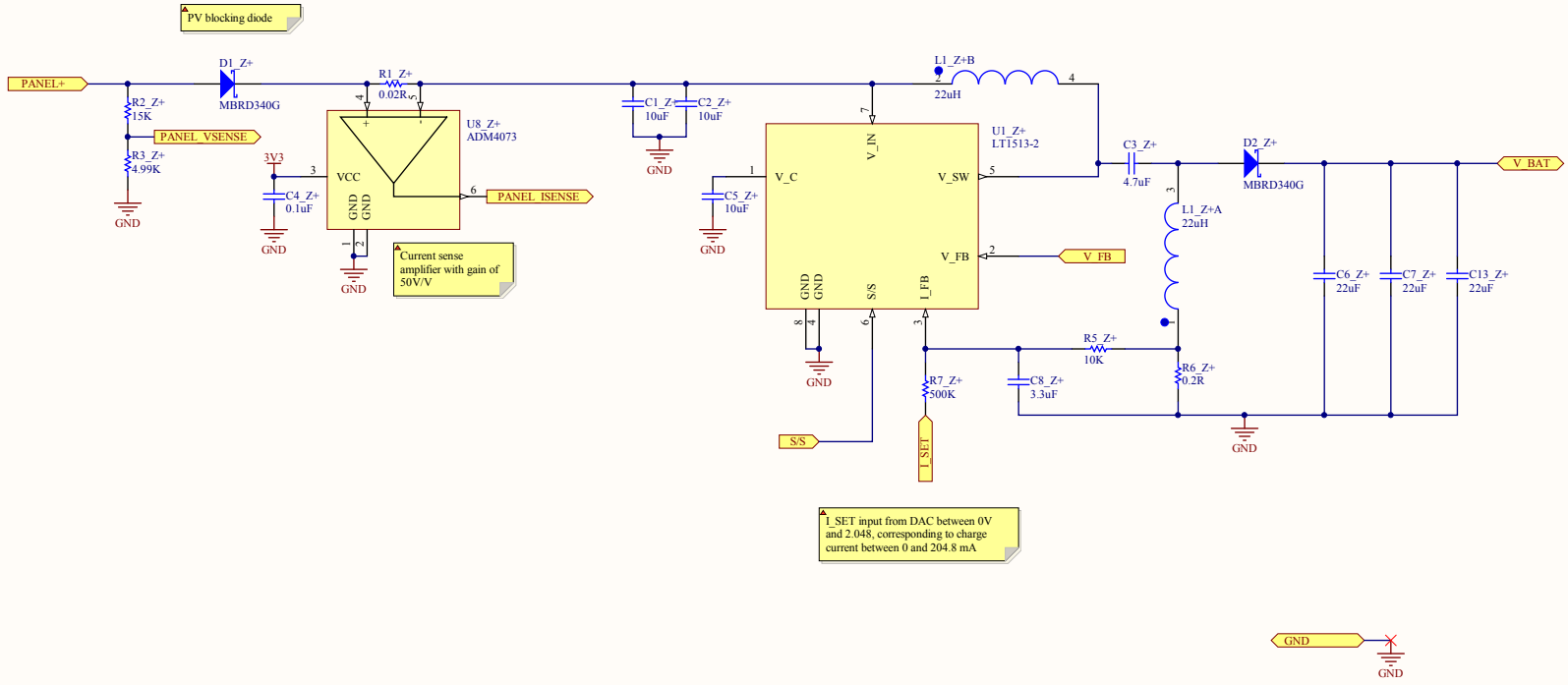


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| Title | ***BLUEsat Battery Charge Regulator*** | *BLUEsat Project Room 419 School of EE&T UNSW, NSW 2052 Australia* |
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| File: C:\Users\Thomas\Desktop\BCR Fork\July 2012 Revision\POWR0001_BCR_LT1513.SchDoc | | |

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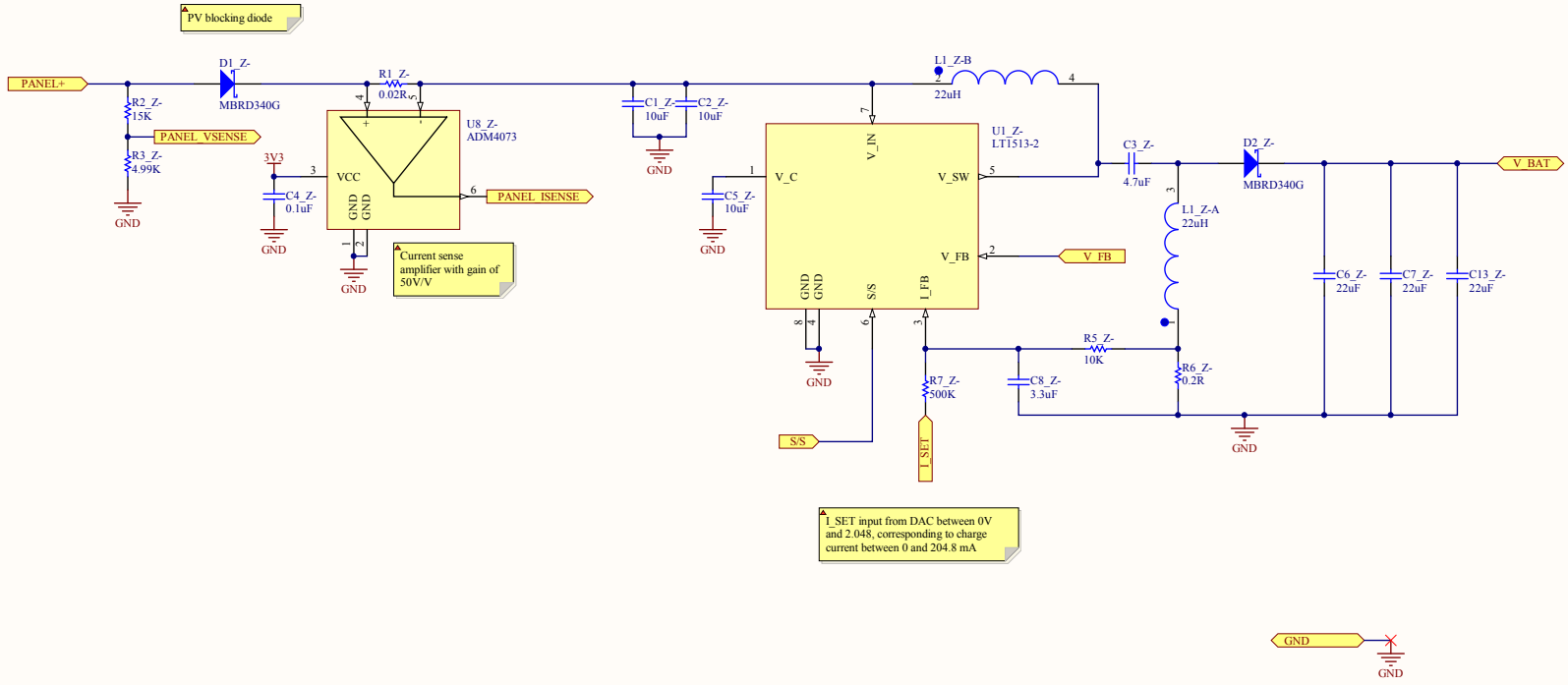
UNSW STUDENT SATELLITE PROJECT

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| Size: A3 | Version 4 | |
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| File: C:\Users\Thomas\Desktop\BCR Fork\July 2012 Revision\POWR0001_BCR_LT1513.SchDoc | | |

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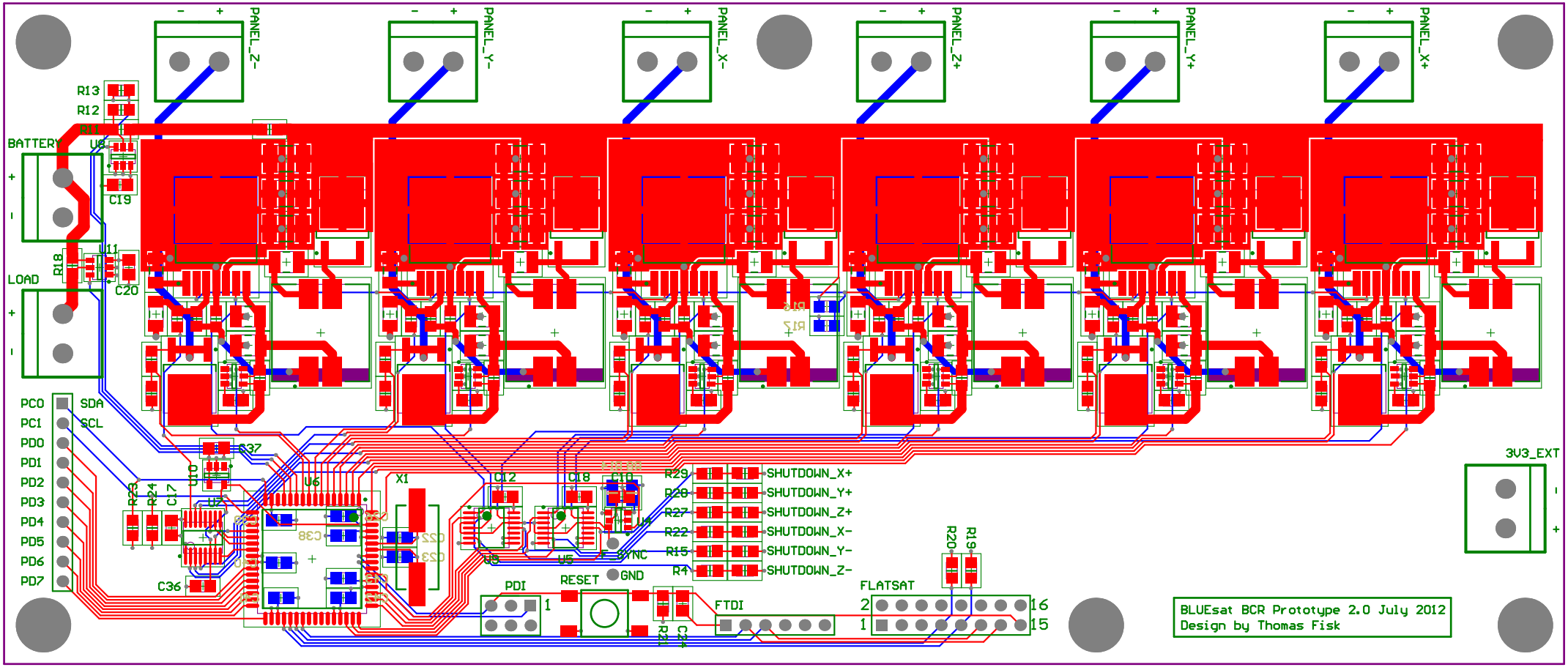
Board Outline, 200mm x 85mm



| Comment | Description | Designator | Footprint | LibRef | Quantity |
|---|---|---|---|---|---|
| Screw Terminal | Header, 2-Pin | 3V3_EXT, BATTERY, LOAD | SCREW2 | Header 2 | 3 |
| Cap | Capacitor | C1_X+, C1_X-, C1_Y+, C1_Y-, C1_Z+, C1_Z-, C2_X+, C2_X-, C2_Y+, C2_Y-, C2_Z+, C2_Z-, C3_X+, C3_X-, C3_Y+, C3_Y-, C3_Z+, C3_Z- | CAPC3225M | Cap | 18 |
| Cap | Capacitor | C4_X+, C4_X-, C4_Y+, C4_Y-, C4_Z+, C4_Z-, C10, C12, C17, C18, C19, C20, C22, C23, C24, C26, C36, C37, C38, C39, C40, C41, C42, C43 | CAPC2012M | Cap | 24 |
| Cap | Capacitor | C5_X+, C5_X-, C5_Y+, C5_Y-, C5_Z+, C5_Z-, C8_X+, C8_X-, C8_Y+, C8_Y-, C8_Z+, C8_Z- | CAPC3216M | Cap | 12 |
| Cap | Capacitor | C6_X+, C6_X-, C6_Y+, C6_Y-, C6_Z+, C6_Z-, C7_X+, C7_X-, C7_Y+, C7_Y-, C7_Z+, C7_Z-, C13_X+, C13_X-, C13_Y+, C13_Y-, C13_Z+, C13_Z- | CAPC4532M | Cap | 18 |
| MBRD340G | Schottky Rectifier | D1_X+, D1_X-, D1_Y+, D1_Y-, D1_Z+, D1_Z-, D2_X+, D2_X-, D2_Y+, D2_Y-, D2_Z+, D2_Z- | TO229P990X238-3N | Diode 11DQ03 | 12 |
| Res2 | Resistor | FB1 | RESC2012M | Res2 | 1 |
| Header 8X2 | Header, 8-Pin, Dual row | FLATSAT | HDR2X8 | Header 8X2 | 1 |
| Header 6 | Header, 6-Pin | FTDI | HDR1X6 | Header 6 | 1 |
| DRQ125 Dual Inductor | | L1_X+, L1_X-, L1_Y+, L1_Y-, L1_Z+, L1_Z- | DRQ125 | DRQ125 Dual Inductor | 6 |
| Solar Panel Connector | | PANEL_X+, PANEL_X-, PANEL_Y+, PANEL_Y-, PANEL_Z+, PANEL_Z- | SCREW2 | Solar Panel Connector | 6 |
| Header 3X2 | Header, 3-Pin, Dual row | PDI | HDR2X3 | Header 3X2 | 1 |
| Res1 | Resistor | R1_X+, R1_X-, R1_Y+, R1_Y-, R1_Z+, R1_Z-, R2_X+, R2_X-, R2_Y+, R2_Y-, R2_Z+, R2_Z-, R3_X+, R3_X-, R3_Y+, R3_Y-, R3_Z+, R3_Z-, R4, R5_X+, R5_X-, R5_Y+, R5_Y-, R5_Z+, R5_Z-, R6_X+, R6_X-, R6_Y+, R6_Y-, R6_Z+, R6_Z-, R7_X+, R7_X-, R7_Y+, R7_Y-, R7_Z+, R7_Z-, R8, R12, R13, R14, R15, R16, R17, R19, R20, R21, R22, R23, R24, R27, R28, R29 | RESC2012M | Res1 | 53 |
| 0805 Resistor | Resistor | R11, R18 | RESC2012M | Res1 | 2 |
| SW-PB | Switch | RESET | RESET SWITCH | SW-PB | 1 |
| 8V0_RX2 | Typical INFRARED GaAs LED | SHUTDOWN_X+, SHUTDOWN_Y-, SHUTDOWN_Z+ | 6-0805_M | LED0 | 3 |
| VVAR_TX1 | Typical INFRARED GaAs LED | SHUTDOWN_X-, SHUTDOWN_Y+, SHUTDOWN_Z- | 6-0805_M | LED0 | 3 |
| Header 10 | Header, 10-Pin | SPARE | HDR1X10 | Header 10 | 1 |
| LT1513-2 | | U1_X+, U1_X-, U1_Y+, U1_Y-, U1_Z+, U1_Z- | LT1513-2_TO127P1420-8N | LT1513-2 | 6 |
| LTC6990MP | | U4 | SOT26A-6L | LTC6990MP | 1 |
| SN74HC02PWLE | Quadruple 2-Input Positive-NOR Gate | U5, U9 | TSOP65P640-14AN | SN74HC02PWLE | 2 |
| ATxmega64A3-AU | 8/ 16-bit AVR XMEGA A3 Microcontroller, 1.6-3.6V, 32MHz, 64KB + 4KB Flash, 2KB EEPROM, 4KB SRAM, 64-pin TQFP, Industrial Grade (-40°C to 85°C), Pb-Free | U6 | 64A_N | ATxmega64A3-AU | 1 |
| LTC1660IGN | | U7 | SOP635P600-16N | LTC1660IGN | 1 |
| ADM4073 | Current Sense Amplifer | U8, U8_X+, U8_X-, U8_Y+, U8_Y-, U8_Z+, U8_Z-, U11 | SOT26A-6N | ADM4073 | 8 |
| LM4120AIM5-2.0 | Precision Micropower Low Dropout Voltage Reference | U10 | MF05A_N | LM4120AIM5-2.0 | 1 |
| 8MHz | Crystal Oscillator | X1 | HC49 - No border | XTAL | 1 |