# OpenROV Controller 2.6

## Digital I/O Channels

| | | | |
|---|---|---|---|
| 0 | BB UART | 28 | User J3-4 |
| 1 | BB UART | 29 | User J3-2 |
| 2 | User J3-11 | 30 | User J2-16 |
| 3 | User J3-9 | 31 | User J2-14 |
| 4 | User J3-7 | 32 | User J2-12 |
| 5 | User J3-5 | 33 | User J2-10 |
| 6 | Servo1 J8-1 | 34 | User J2-8 |
| 7 | Servo2 J8-4 | 35 | User J2-6 |
| 8 | Servo3 J8-7 | 36 | User J2-4 |
| 9 | Servo4 J8-10 | 37 | User J2-2 |
| 10 | Servo5 J8-13 | 38 | N/C |
| 11 | Servo6 J8-16 | 39 | N/C |
| 12 | PWM4 J1-7/8 | 40 | N/C |
| 13 | LED | 41 | N/C |
| 14 | User J2-11 | 42 | N/C |
| 15 | User J2-9 | 43 | N/C |
| 16 | ESC Power Switch | 44 | PWM1 J1-1/2 |
| 17 | N/C | 45 | PWM2 J1-3/4 |
| 18 | User J2-7 | 46 | PWM3 J1-5/6 |
| 19 | User J2-5 | 47 | N/C |
| 20 | I2C SDA J1-14 | 48 | N/C |
| 21 | I2C SCL J1-12 | 49 | LED |
| 22 | User J3-16 | 50 | SPI MISO to BB and ICSP Header |
| 23 | User J3-14 | 51 | SPI MOSI to BB and ICSP Header |
| 24 | User J3-12 | 52 | SPI SCK to BB and ICSP Header |
| 25 | User J3-10 | 53 | SPI SS to BB |
| 26 | User J3-8 | | |
| 27 | User J3-6 | | |

## Analog I/O Channels

| | | |
|---|---|---|
| 0 | Controller and BB Battery Current | |
| 1 | ESC 3 Current | |
| 2 | ESC 2 Current | |
| 3 | ESC 1 Current | |
| 4 | Battery Voltage (after protection diodes) | |
| 5 | Battery 2 Current | |
| 6 | Battery 1 Current | |
| 7 | Humidity (optionally populated) | |
| 8 | Board Temperature | |
| 9 | User | J4-14 |
| 10 | User | J4-12 |
| 11 | User | J4-10 |
| 12 | User | J4-8 |
| 13 | User | J4-6 |
| 14 | User | J4-4 |
| 15 | User | J4-2 |

## Revision History

| Rev | Date | Engr | Changes |
|---|---|---|---|
| 2.5 | 13 Aug 2013 | RWH | Initial Prototype |
| 2.5 Rev A | 20 Aug 2013 | RWH | Prototype Batch. Revised J6 connector orientation. Changed BB node names. Revised C11, C15, and U5 and added C34 to avoid +5V and +3.3V brownout when switching ESCs on. Revised ESC mounting holes. Revised LED colors. Revised silkscreen. Added weak Arduino reset pullup for standalone operation. Added cap slot C35 to hold vehicle on if noisy tether connection. Added bypass points J17 for ESC power switch. Arduino reset function moved from BB pin 13 to BB pin 11. |
| 2.5 Rev B | 2 Sep 2013 | RWH | First production batch. J6 changed from socket to male board stacker. 4th mounting hole added to board. Revised fiducial locations. Inverted logical case of UART LEDs. BB TX LED moved from Arduino space to BB space. Board ID EEPROM circuitry DNP. |
| 2.6 | 12 Nov 2013 | RWH | Layout changes to accept V2.0 Tenda/MediaLink Homeplug adapter. Additonal sockets added to accept V2.0 pin configuration. LEDs added to display Homeplug adapter status. Board ID circuitry modified. Servo output connector split into two. Filters added to ESC current monitors. Test points updated. Silkscreen updated. |
| | | | |

## Sheet Finder



OpenROV



Cover Page

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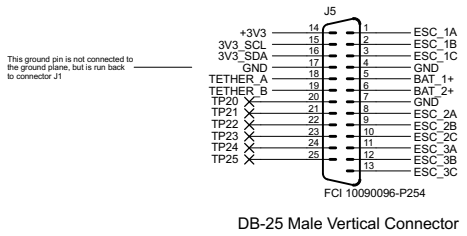
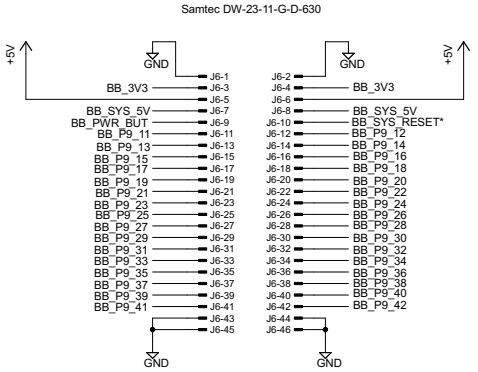
## Wire Harness Connector

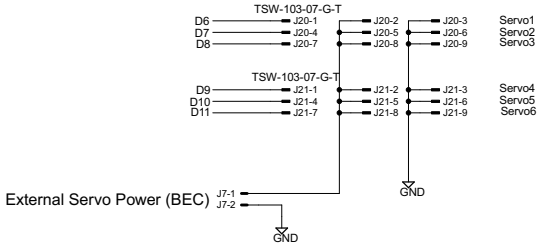



DB-25 Male Vertical Connector

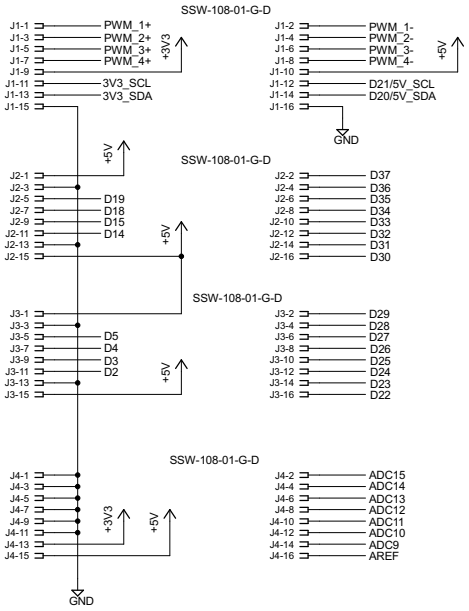
## BeagleBone P9 Connector




## Servo Outputs

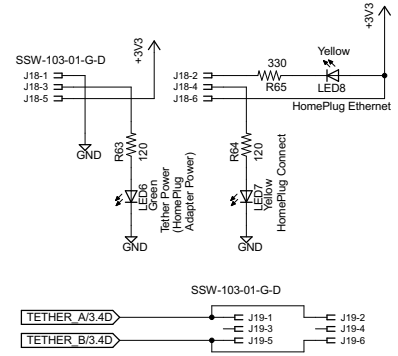



## Header Sockets

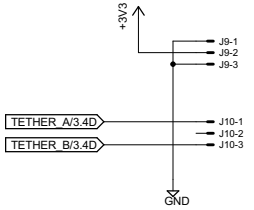



## Homeplug Adapter Connectors

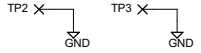
### Sockets for Tenda V2.0 Adapters




### Solder Pads for Tenda V1.0 Adapters




## Ground Points




## Alignment Fiducials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## Input / Output

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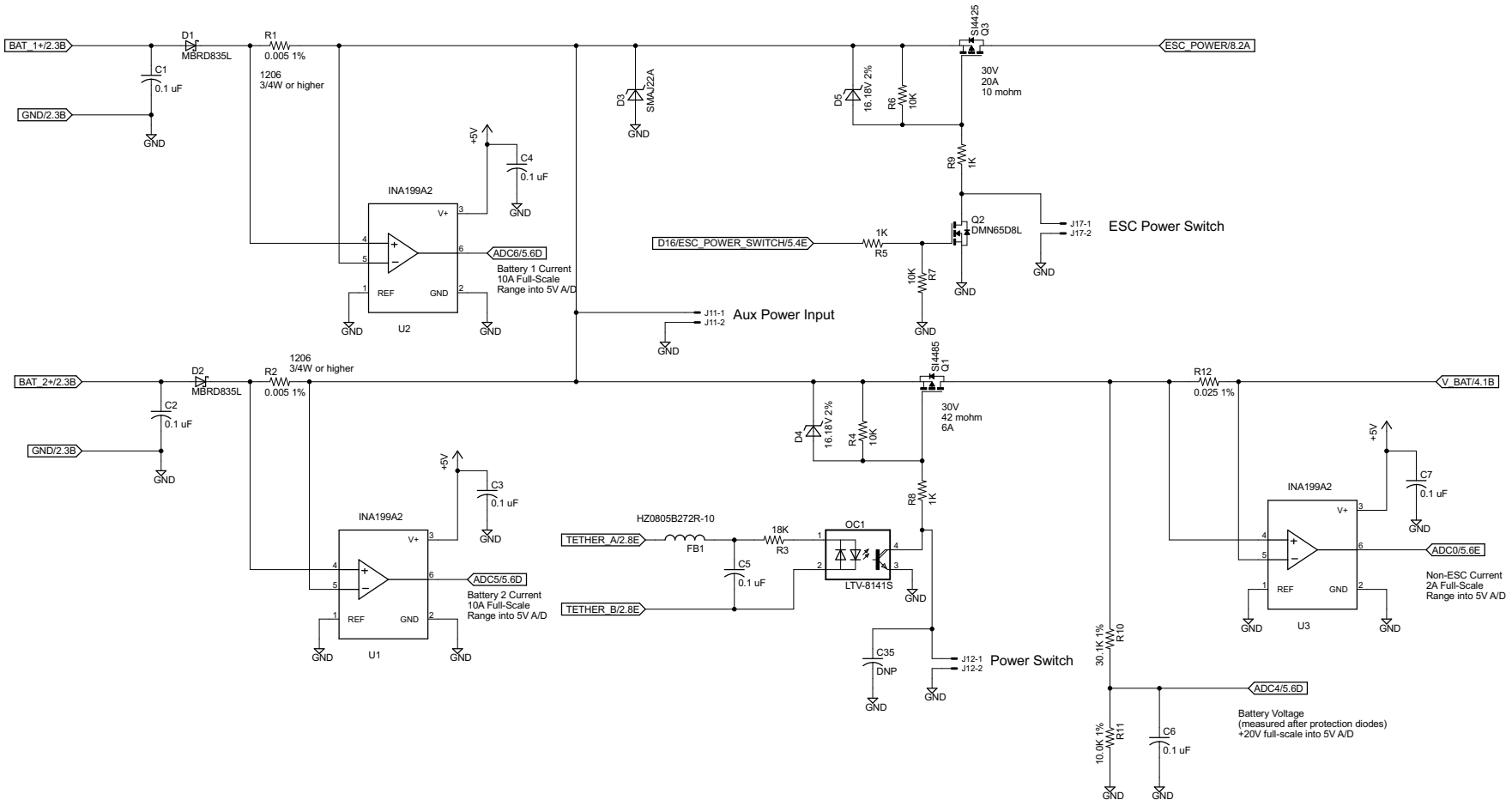


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## Power Switching

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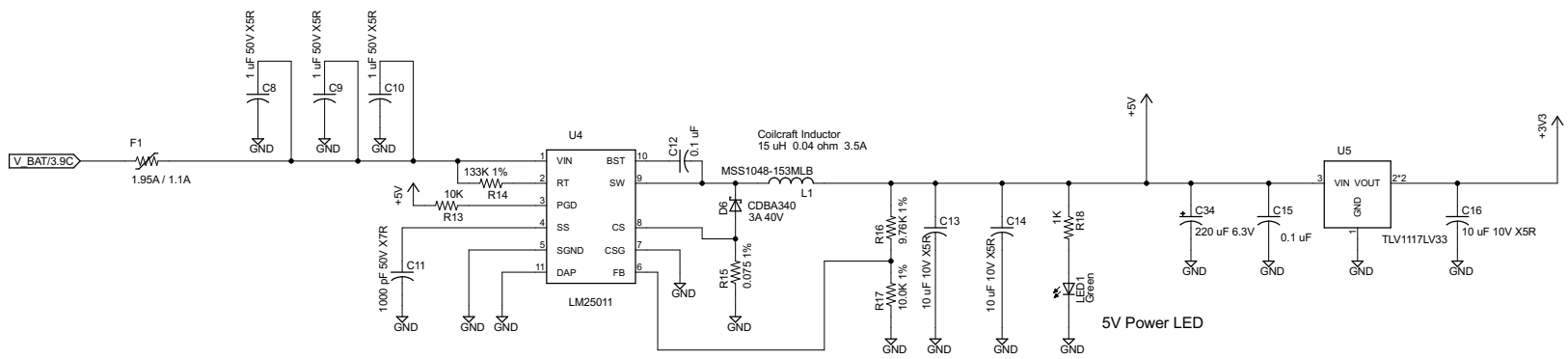


+5V Supply Adapted from the CircuitCo OpenROV Cape



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5V and 3.3V Power

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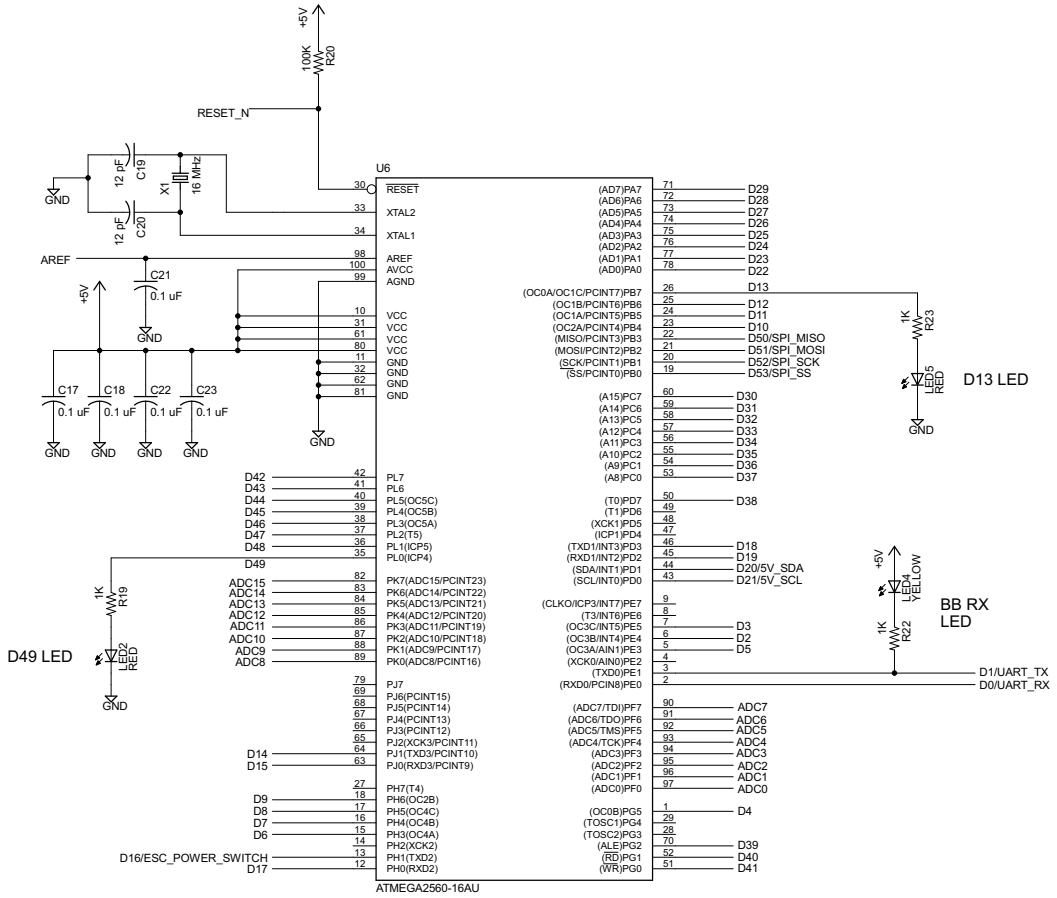


Adapted from Arduino Mega 2560 R3

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## Microcontroller

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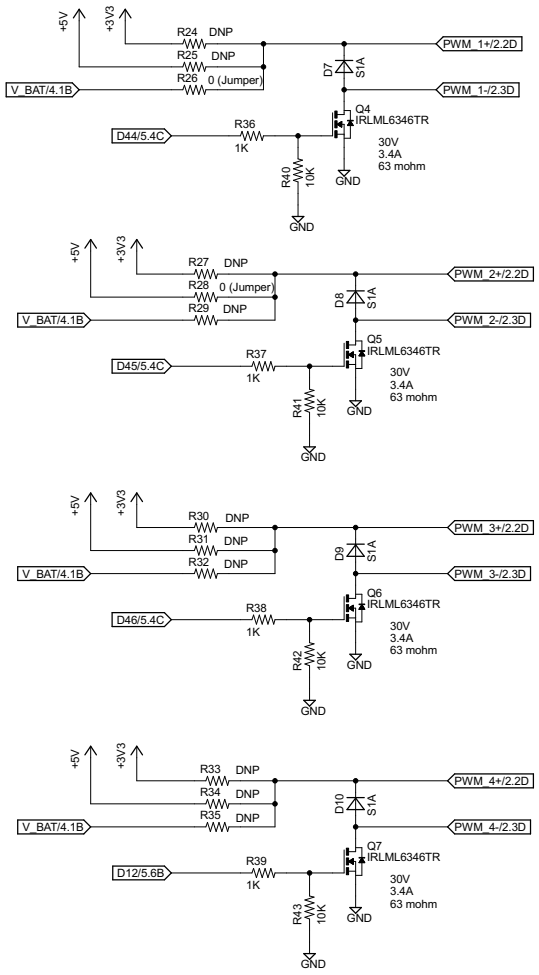
## PWM Outputs

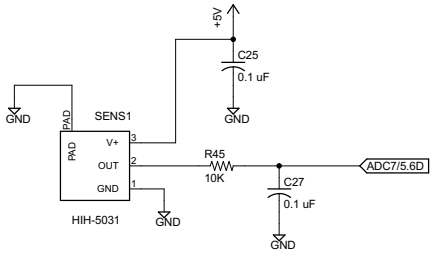
Populate one jumper only for each PWM channel.

Select from maximum output of 3.3V, 5V, or battery voltage

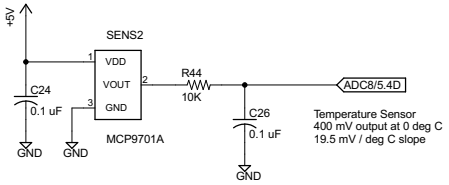
Default configuration is Battery Voltage on Channel 1 (LED Modules), and 5V on Channel 2 (Scaling Lasers)




## Humidity Sensor




## Temperature Sensor

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PWM and Environment Sensors

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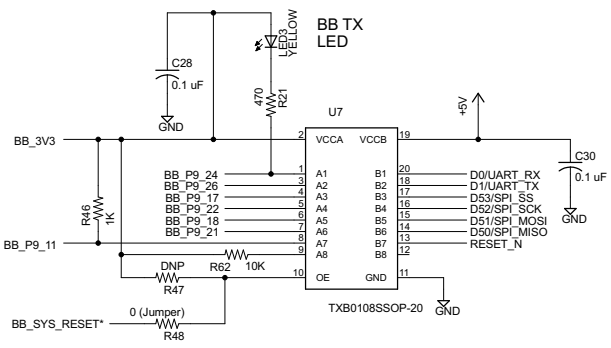
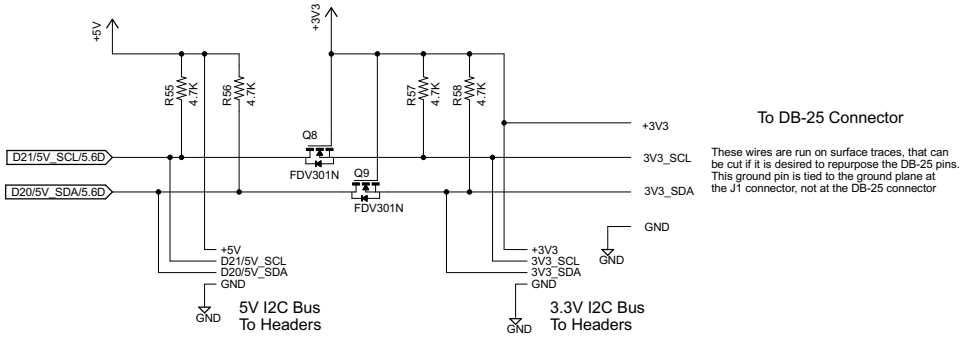
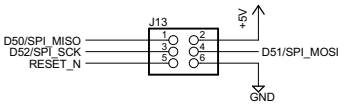
## BeagleBone Interface



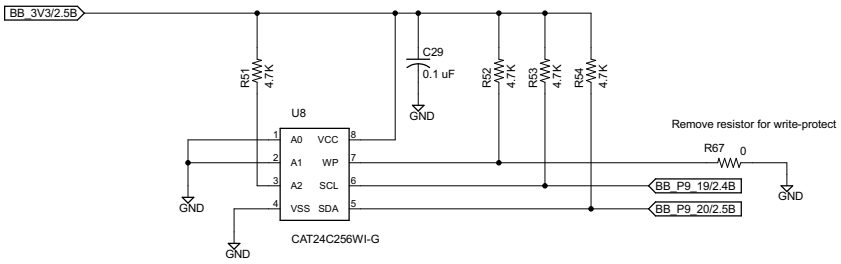

## I2C Interface




## ICSP Header




## BeagleBone Cape ID

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I2C and BeagleBone Interface

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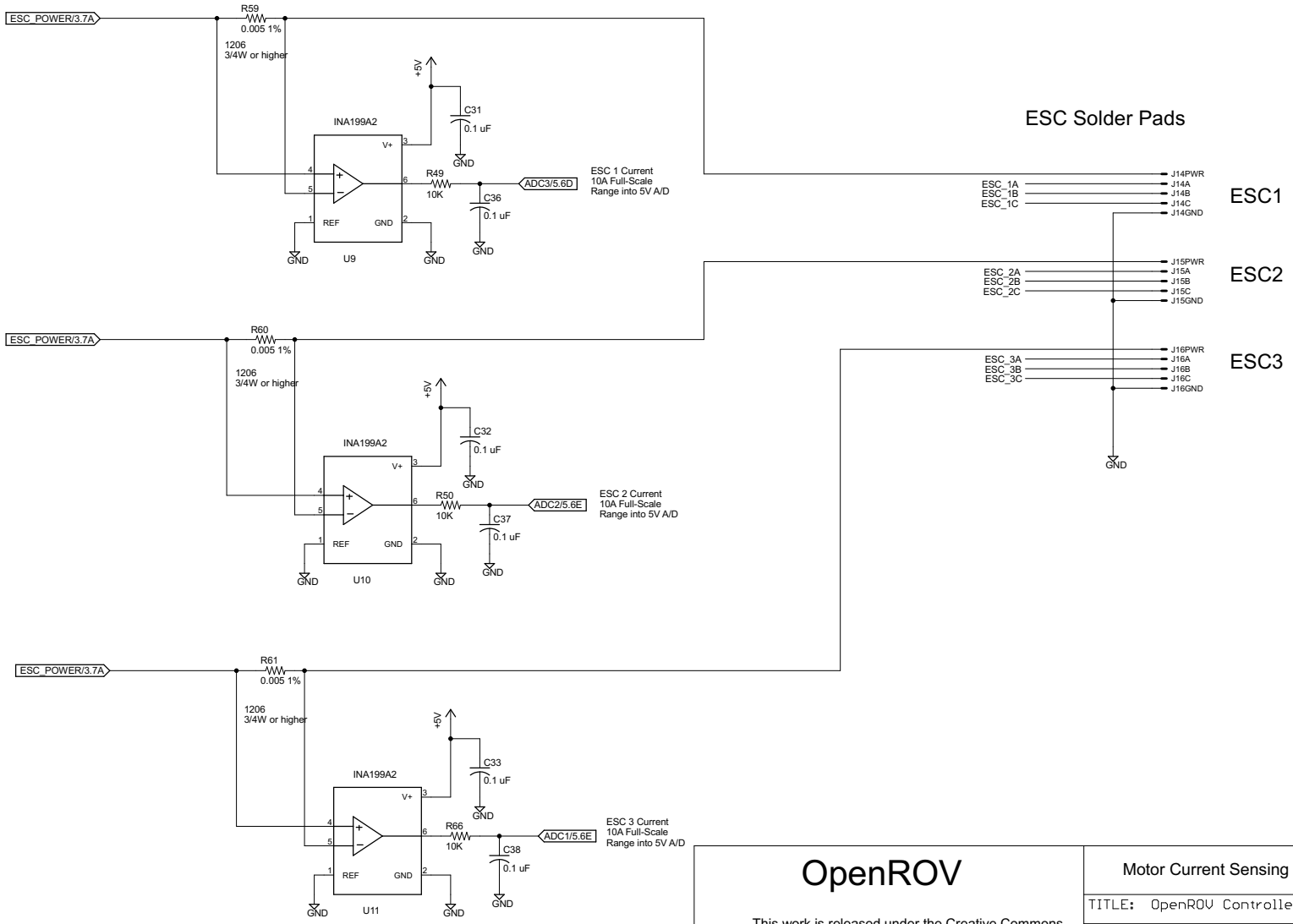


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Motor Current Sensing and ESC Connections

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