

REVISION HISTORY					
REV	DESCRIPTION	CAT	DWN	ENGR	SEE JPL DATA MANAGEMENT SYSTEM FOR APPROVAL SIGNATURES AND DATES
A	_____ INITIAL RELEASE _____	II			
B	CORRECTED R79 & R97. PREPARED FOR UNLIMITED RELEASE.	II			
C	CHANGE FROM CONCERTO TO DELFINO SUPPORT. ADDED DIFFERENTIAL CURRENT SENSE AND ENCODER OPTIONS.	II			

Sheet Listing

- 1 Title page and contents
- 2 Processor and Memory
- 3 Encoder
- 4 VC, Offload & Snubber Hall Sensors
- 5 Comm and Power I/O
- 6 Fixed Power Supplies
- 7 Variable Power Supplies
- 8 Voice Coil Driver
- 9 Offload Motor Driver
- 10 Snubber Motor Driver

NOTES: UNLESS OTHERWISE SPECIFIED

DO NOT SCALE DRAWING
INTERPRET DEMENSIONING AND
TOLERANCING PER ASME Y14.5 2009
INTERPRET DWG PER ASME Y14.100

		CONTRACT NO _____	
		DWN	C SHELTON
		ENGR	C SHELTON
		SEE JPL DATA MANAGEMENT SYSTEM FOR APPROVAL SIGNATURES AND DATES	
10398534	TMT		
NEXT ASSEMBLY	USED ON		
APPLICATION			

JET PROPULSION LABORATORY			
CALIFORNIA INSTITUTE OF TECHNOLOGY PASADENA, CA 91109			
TITLE SCHEMATIC, M1 ACTUATOR DRIVER			
SIZE B	DAI 23835	DWG NO 10398533	REV C
SCALE: NONE	UNCLASSIFIED	SHEET 1 OF 10	

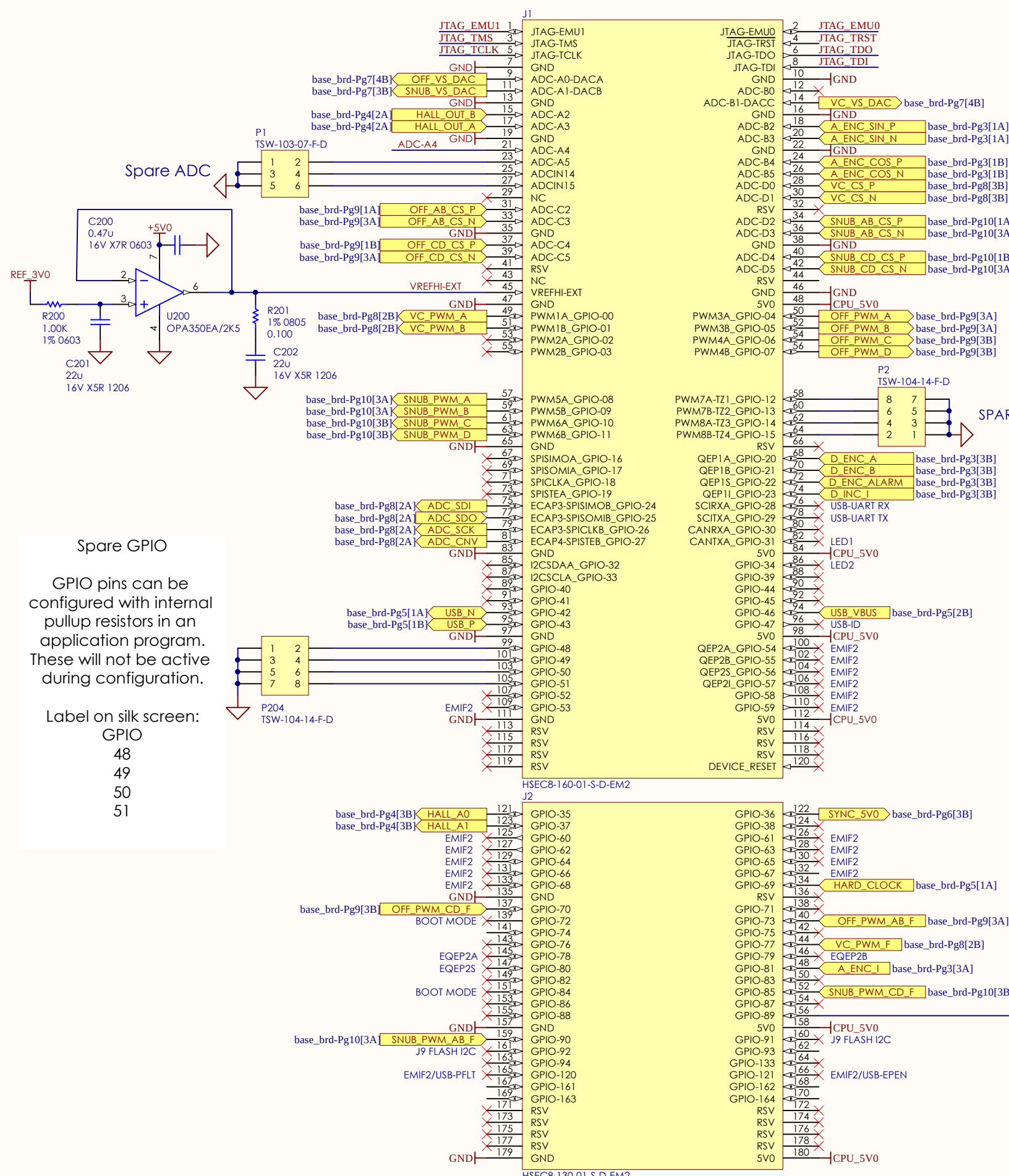
ALTUM GENERATED

B

B

A

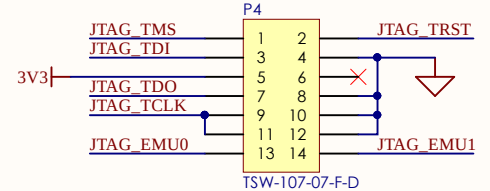
A



Emulator Connector

Place near J1, using short traces.
Remove Pin 6

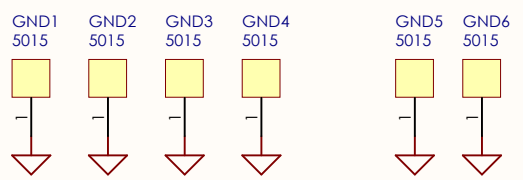
Label on silk screen:
EMULATOR



Place GND1 through GND4 on the four corners of the board, on top.

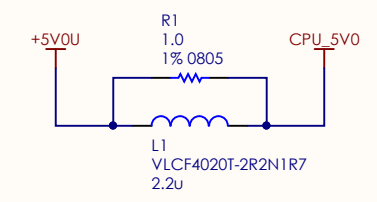
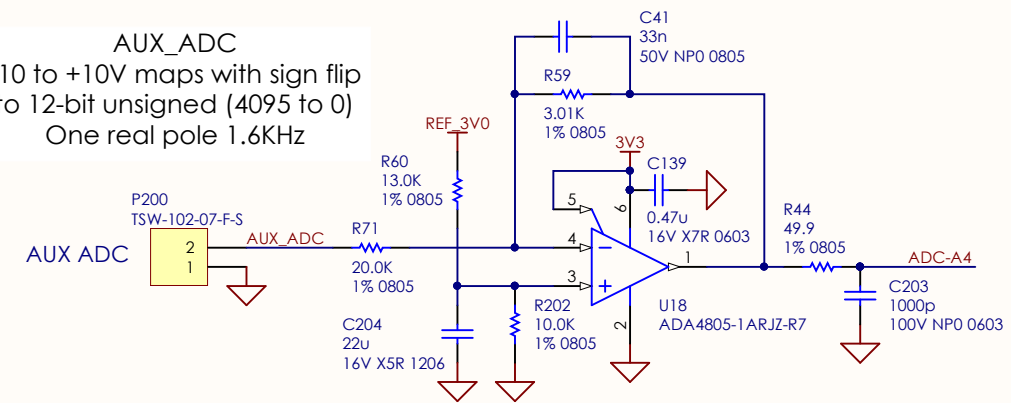
Place GND5 and GND6 on the bottom, at each end of the motor/voice coil outputs.

Label each instance on silk screen with "GND"



AUX_ADC

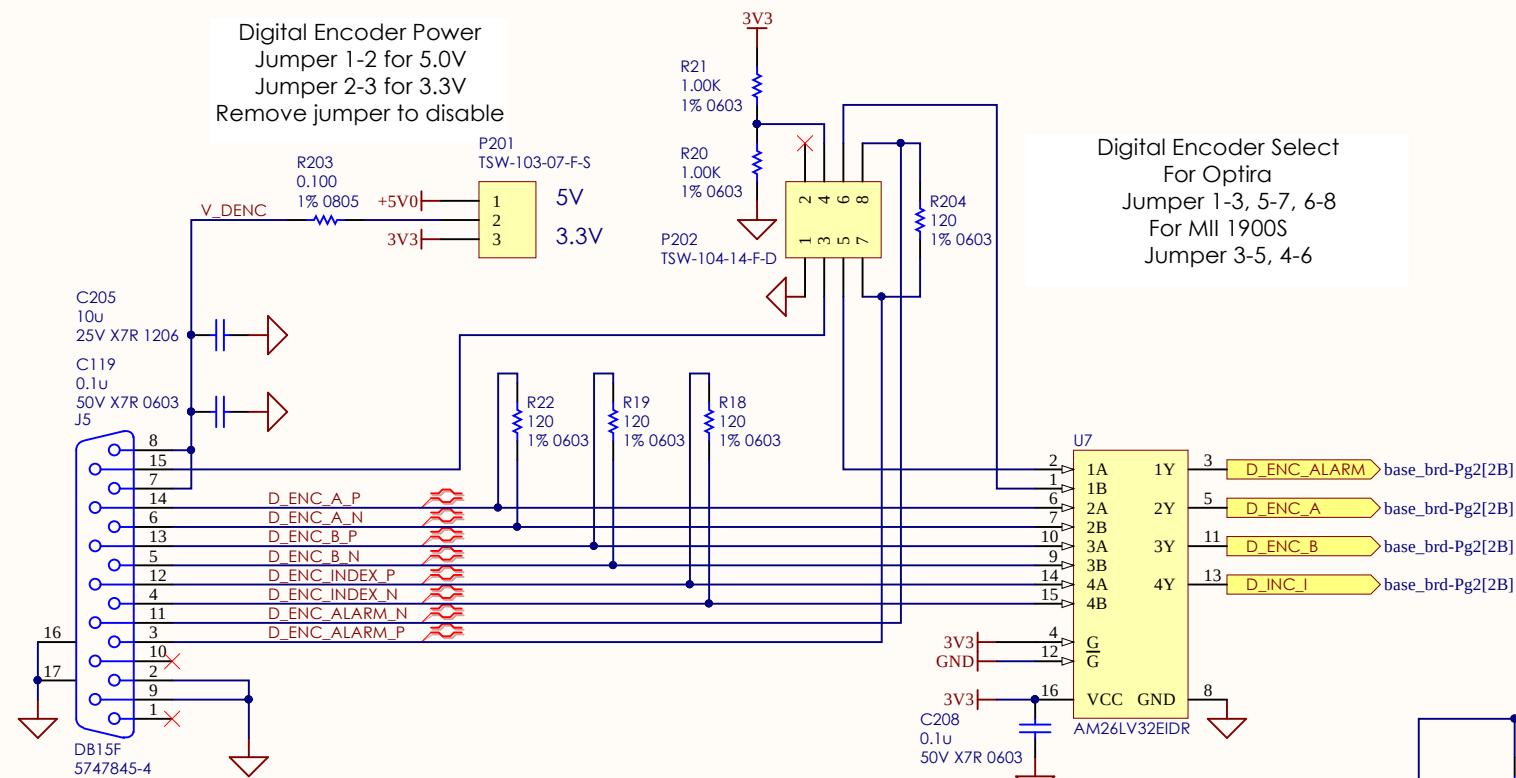
-10 to +10V maps with sign flip
to 12-bit unsigned (4095 to 0)
One real pole 1.6KHz



Processor

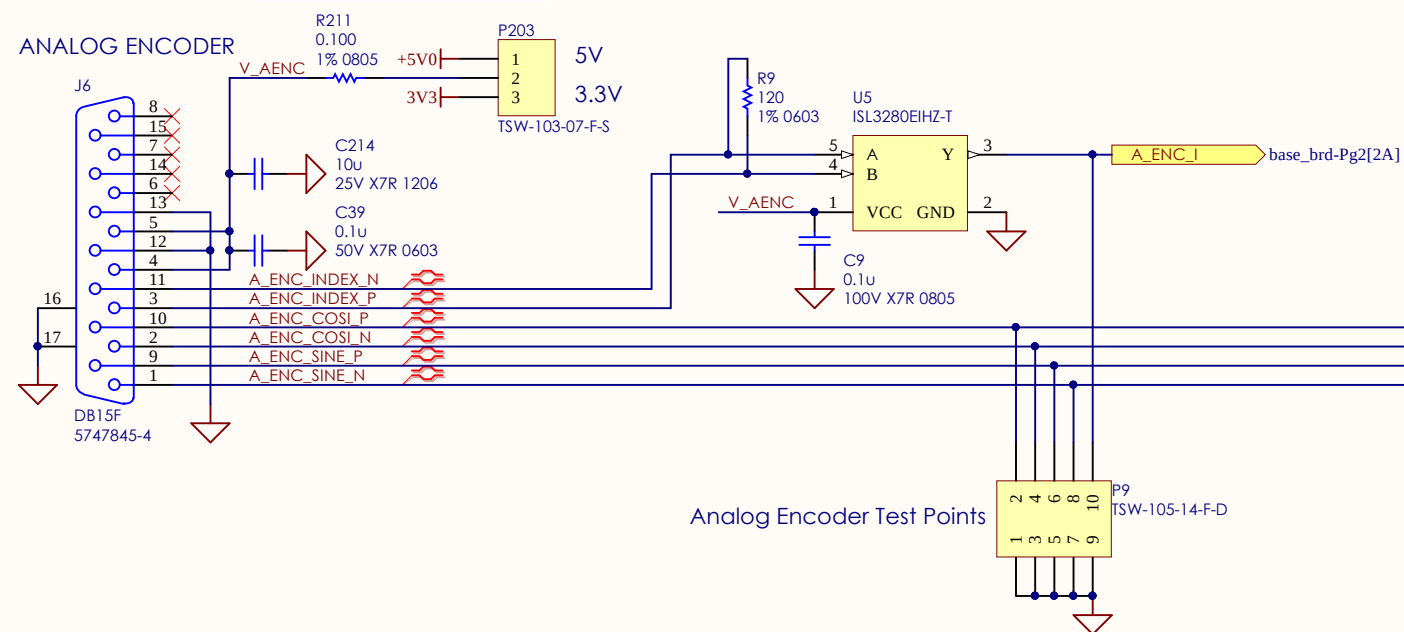
SIZE	CAGE CODE	REV
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SCALE: NONE	UNCLASSIFIED	SHEET 2 OF 10

Digital Encoder Power
Jumper 1-2 for 5.0V
Jumper 2-3 for 3.3V
Remove jumper to disable



DIGITAL ENCODER

Analog Encoder Power
Jumper 1-2 for 5.0V
Jumper 2-3 for 3.3V
Remove jumper to disable



Analog Encoder Test Points

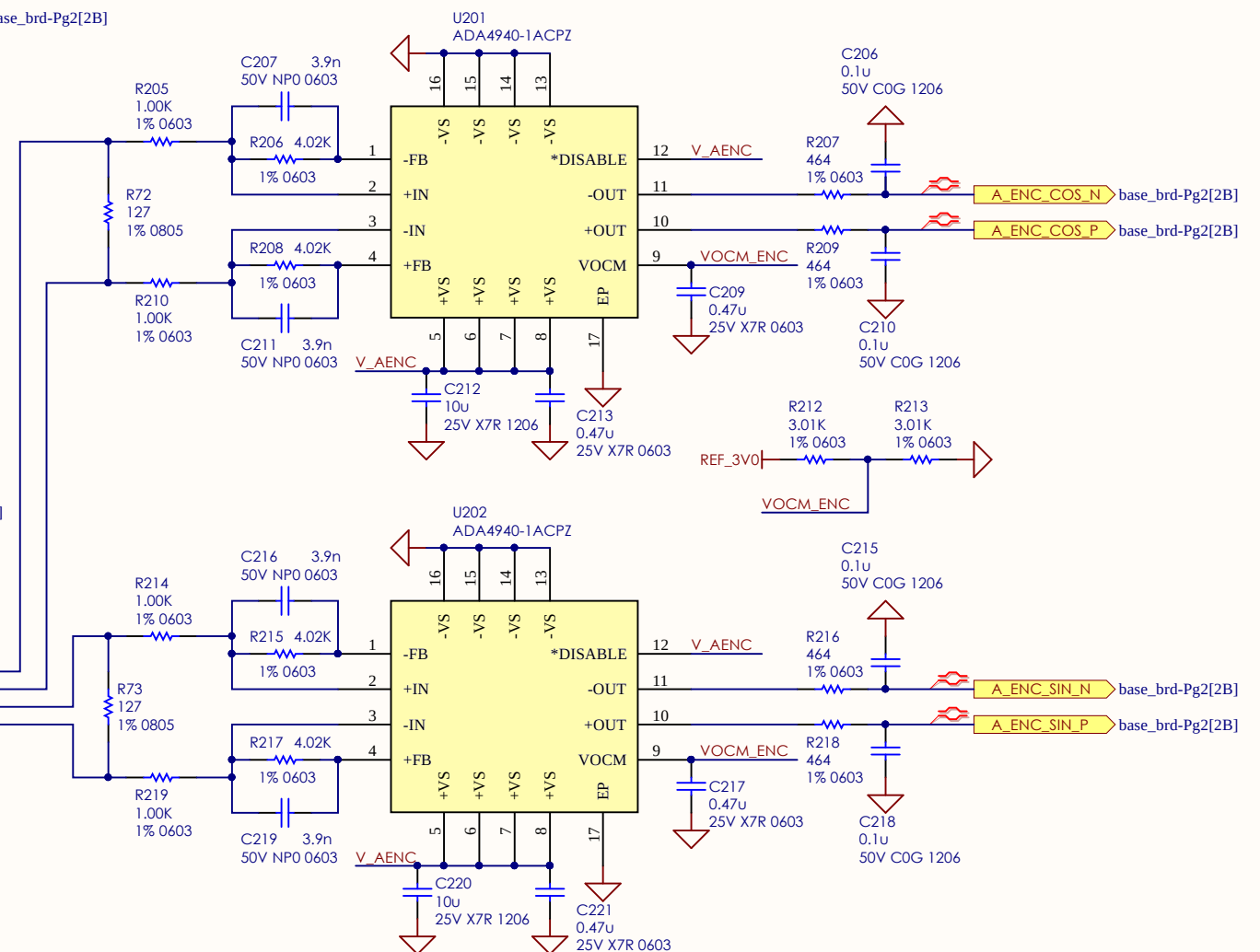
Route all paired traces on this page, digital and analog, as 120 ohm differential pairs.

Optionally, remove RS422 terminating resistors: R16, R17, R18, R19, R22 on digital encoder, R9 on analog encoder. Do not remove analog terminations R72, R73.

Place the analog encoder ADC driver parts near J1, with short output traces.

Add 15nF 25V NP0 0603 caps to Delfino Control Card in the C38, C39, C40, C41 positions. These, plus components on this page, give two real poles, at 10kHz, 3kHz

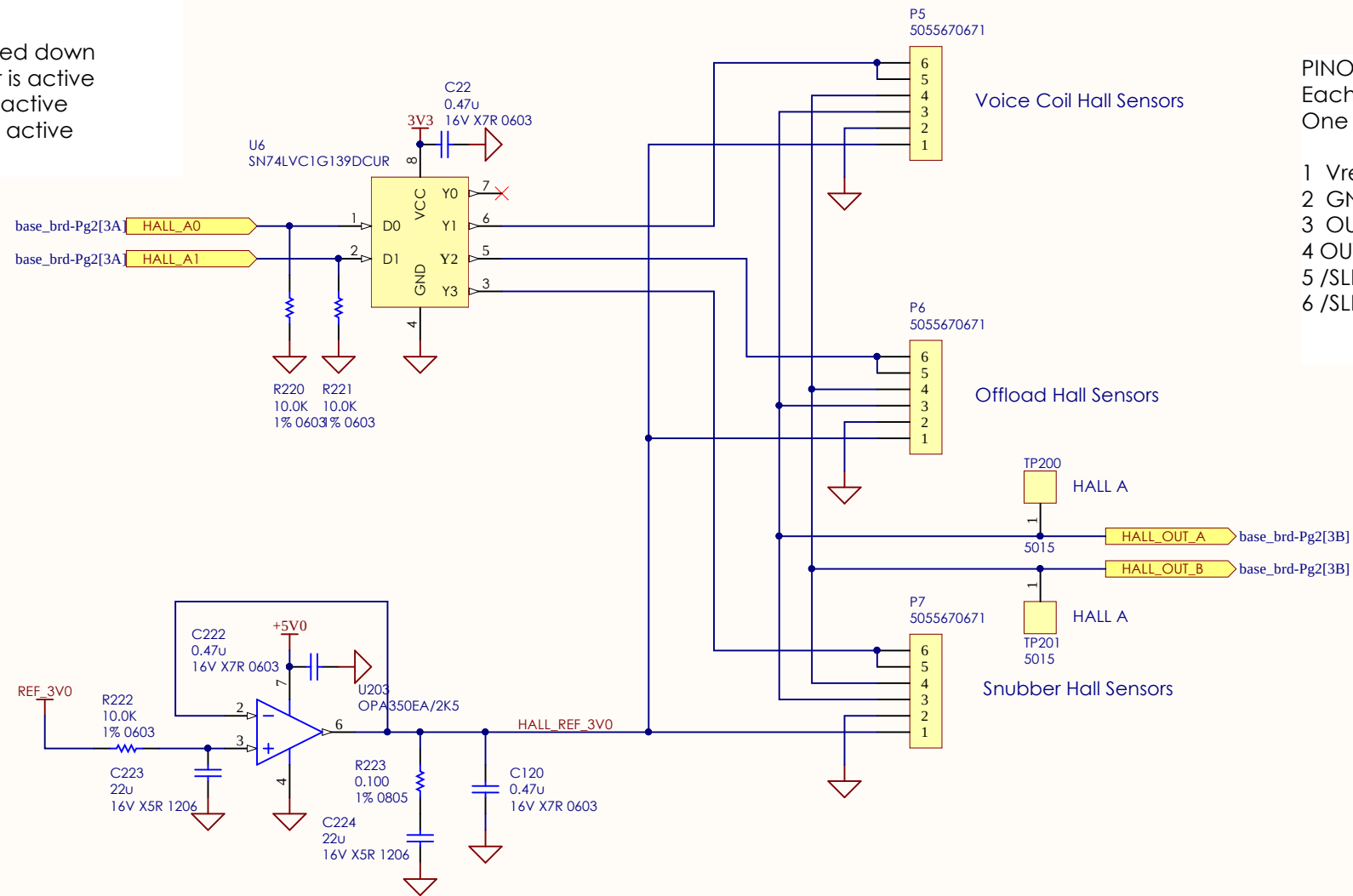
1.5V pp differential input maps to 6.0V pp differential output, which maps to 0 to 65535 counts.



Encoders

INPUT CODES FOR HALL SENSORS
One sensor pair is enabled at a time, or all are powered down.

Input Code	Result
00	All Hall sensors powered down
01	Voice Coil sensor pair is active
10	Offload sensor pair is active
11	Snubber sensor pair is active



PINOUT FOR HALL SENSORS
Each connector supports two hall sensors.
One sensor pair is enabled at a time.

- 1 Vref, Vcc
- 2 GND
- 3 OUT1
- 4 OUT2
- 5 /SLEEP1
- 6 /SLEEP2

VC, OFFLOAD & SNUBBER HALL SENSORS

B

A

B

A

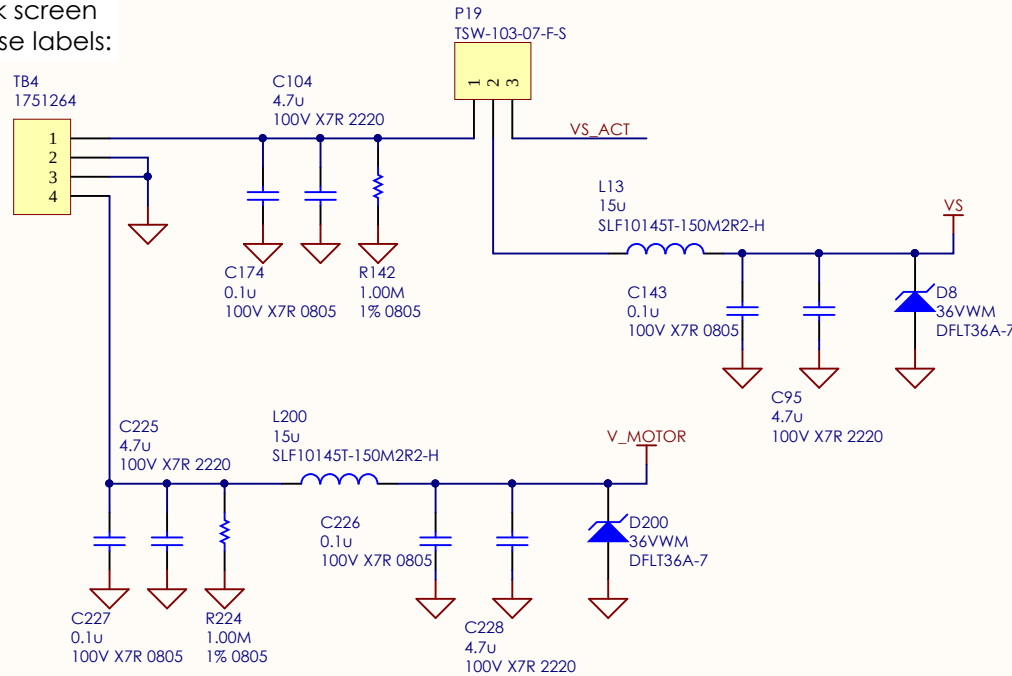
JUMPER OPTIONS FOR ROUTING POWER

Standalone - Connect 1-2
(Powered from external supply)

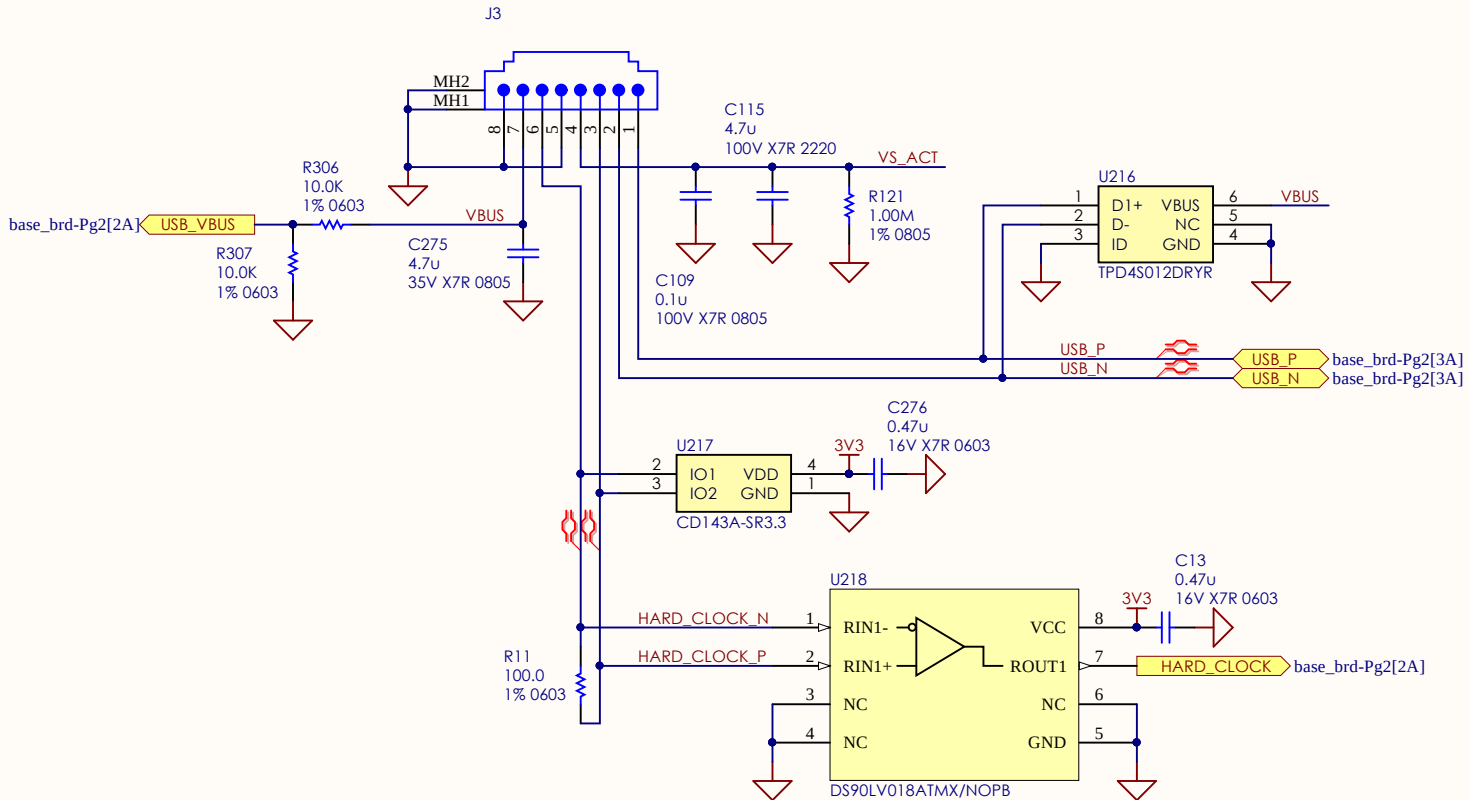
Emulate Actuator Board - Connect 2-3
(Actuator connector receives power, USB, and hard clock)

POWER
CONNECTOR
Mark silk screen
with these labels:

+24 VDC
GND
GND
V_MOTOR



Actuator Connector

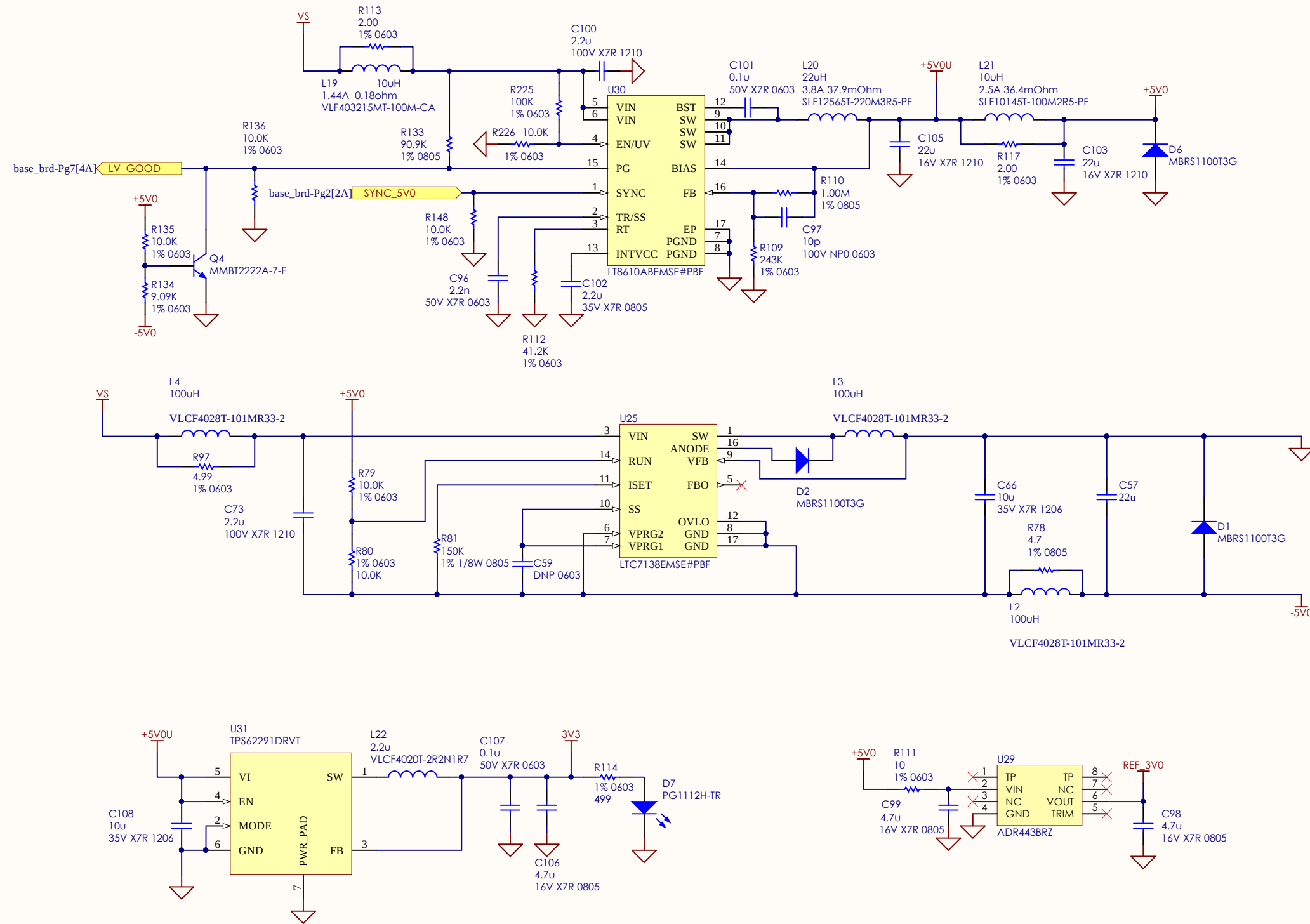


Comm and Power I/O

SIZE	CAGE CODE	REV
B	23835	C
SCALE: NONE	UNCLASSIFIED	SHEET 5 OF 10

B

B



A

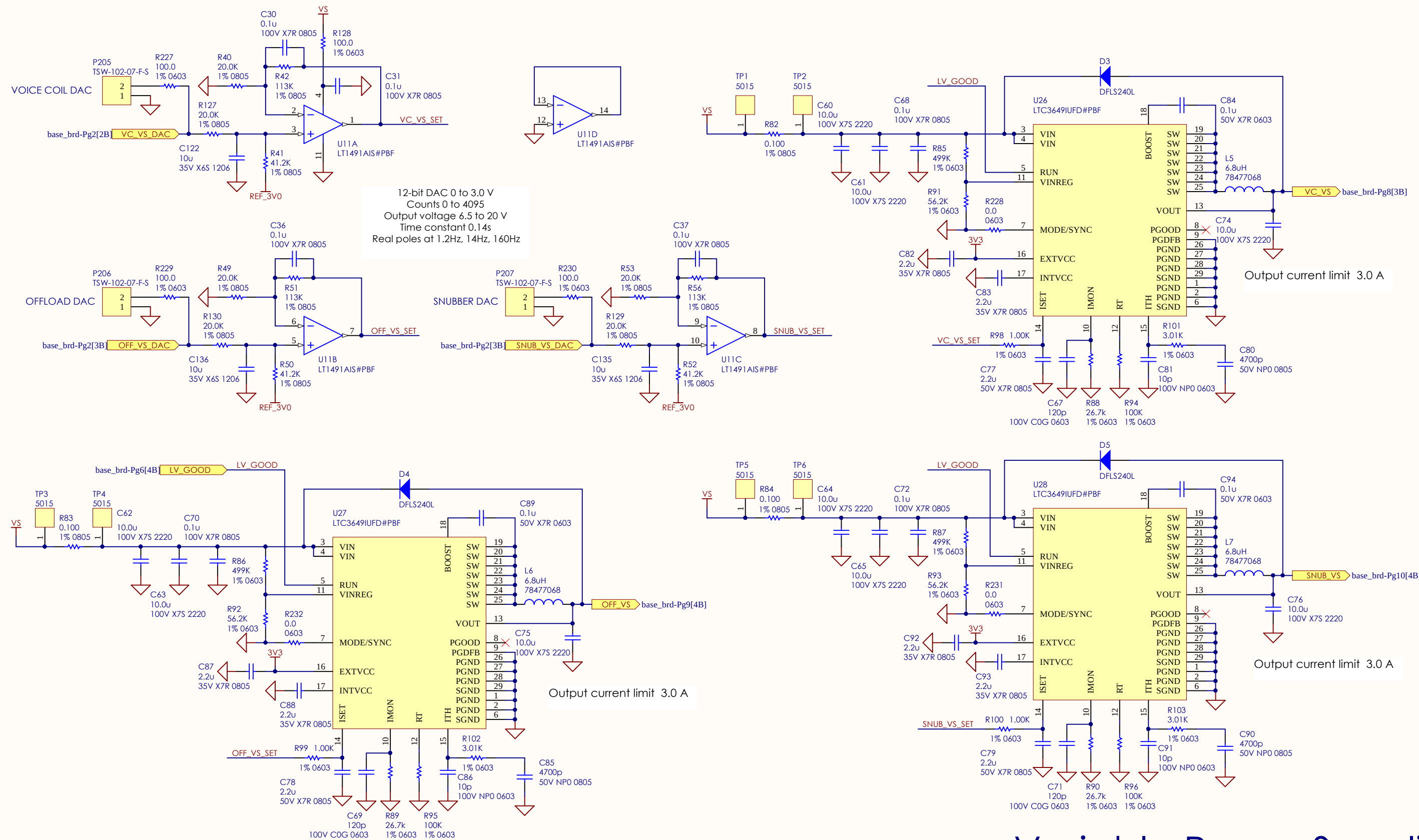
Fixed Power Supplies

4

3

2

1



B



A



SIZE B	CAGE CODE 23835	10398533	REV C
SCALE: NONE	UNCLASSIFIED	SHEET 8 OF 10	

B

B

Jumper 1-2 for DAC-controlled supply
Jumper 2-3 for external motor supply

Label:
OFFLOAD

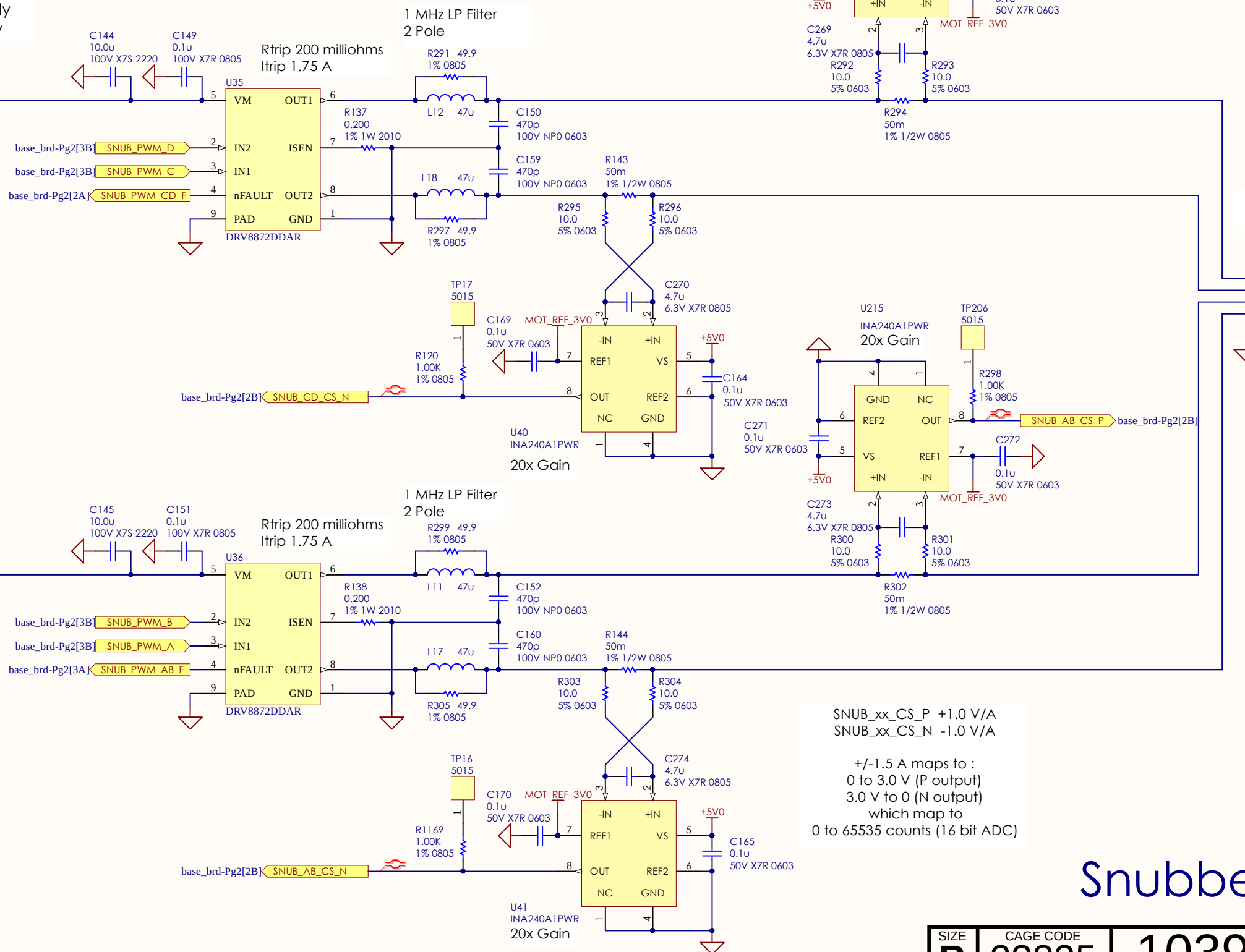
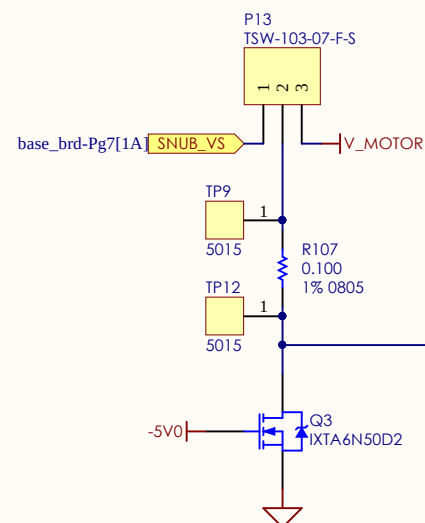
A

A

Offload Driver

SIZE	CAGE CODE	REV
B	23835	C
SCALE: NONE	UNCLASSIFIED	SHEET 9 OF 10

Jumper 1-2 for DAC-controlled supply
Jumper 2-3 for external motor supply



Snubber Driver