SLI Backplane Card Default Edge Connector

First 104 pins follow pumpkin CSK bus (Rev E) pins
Some user and IO pins have been assigned by SLI
(that are not used by any other functions)

P1
Card Edge for HSEC8-160-01-S-DV-A-K-TR

SEP1	1	2	SEP2
-Z_SOLAR_TLE	3	4	+X_SOLAR_TLE
-Z_SOLAR_RTN	5	6	+X_SOLAR_RTN
-Z_SOLAR_PWR	7	8	+X_SOLAR_PWR
H1-1	9	10	H1-2
H2-1	11	12	H2-2
H1-3	13	14	H1-4
H2-3	15	16	H2-4
H1-5	17	18	H1-6
H2-5	19	20	H2-6
H1-7	21	22	H1-8
H2-7	23	24	H2-8
H1-9	25	26	H1-10
H2-9	27	28	H2-10
H1-11	29	30	H1-12
H2-11	31	32	H2-12
H1-13	33	34	H1-14
H2-13	35	36	H2-14
RBF	37	38	H1-16
H2-15	39	40	H2-16
H1-17	41	42	H1-18
H2-17	43	44	H2-18
H1-19	45	46	H1-20
H2-19	47	48	H2-20
H1-21	49	50	H1-22
H2-21	51	52	H2-22
H1-23	53	54	H1-24
H2-23	55	56	H2-24
H1-25	57	58	H1-26
H2-25	59	60	H2-26
H1-27	61	62	H1-28
VCC_sys	63	64	VCC_sys
BUS_RESET	65	66	H1-30
GND	67	68	GND
H1-31	69	70	5V_USB
AGND	71	72	GND
H1-33	73	74	H1-34
H2-33	75	76	H2-34
H1-35	77	78	H1-36
H2-35	79	80	H2-36
H1-37	81	82	H1-38
H2-37	83	84	H2-38
H1-39	85	86	H1-40
H2-39	87	88	H2-40
SDA_SYS	89	90	H1-42
H2-41	91	92	H2-42
SCL_SYS	93	94	H1-44
H2-43	95	96	H2-44
H1-45	97	98	H1-46
H2-45	99	100	H2-46
SELF_TEST	101	102	USER_1
GND	103	104	GND
USER_2	105	106	H1-50
H2-49	107	108	H2-50
H1-51	109	110	H1-52
H2-51	111	112	H2-52
+Y_SOLAR_TLE	113	114	-X_SOLAR_TLE
+Y_SOLAR_RTN	115	116	-X_SOLAR_RTN
+Y_SOLAR_PWR	117	118	-X_SOLAR_PWR
SEP3	119	120	SEP4

End of CSK Bus Pins

GND
GND

H2-26
H2-25
+5V

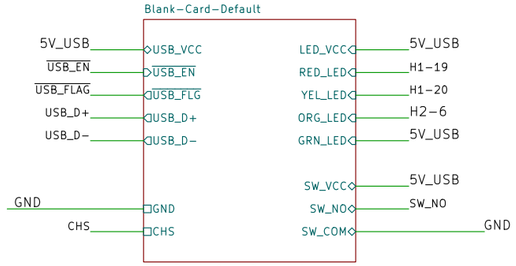
VCC_sys
+3.3V

H1-33
5V_RF

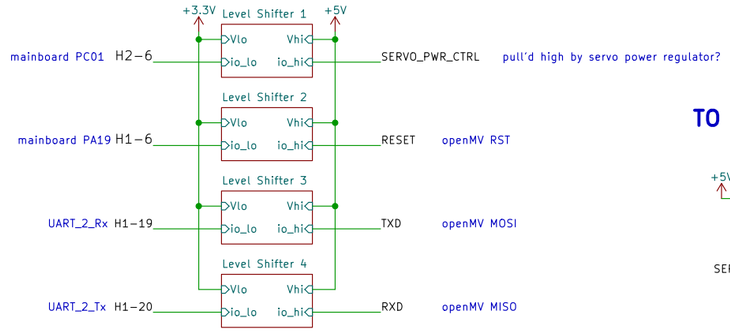
make more concise

SLI Backplane Card Default Circuitry

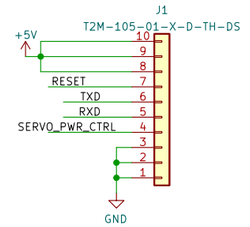
USB 2.0 microB



PAYLOAD LEVEL SHIFTERS



TO FORAS PROMINEO PAB



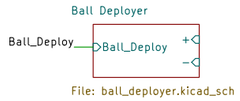
I2C PROTECTION

IMU

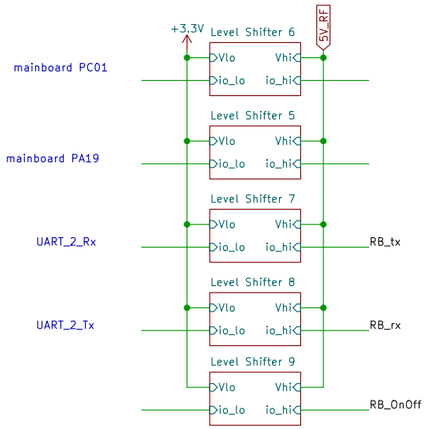
MAGNETORQUER DRIVERS

TO MAGNETOTORQUERS

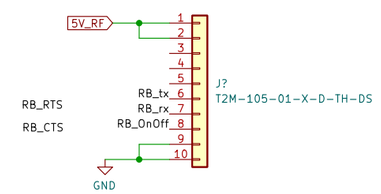
PAYLOAD BALL DEPLOYER



ROCKBLOCK LEVEL SHIFTERS



TO ROCKBLOCK 9602



Sierra Lobo INC	
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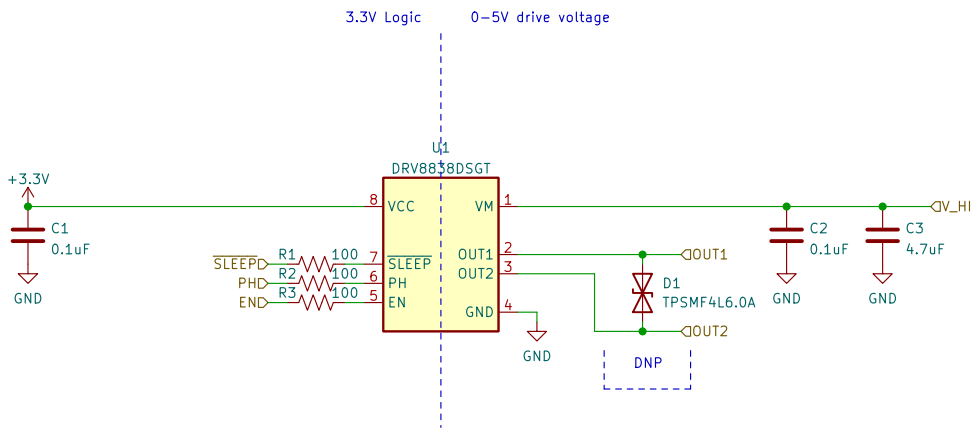
Size: B	Date: 2021-11-05
KiCad E.D.A. kicad (6.0.4)	Rev: A Id: 1/25



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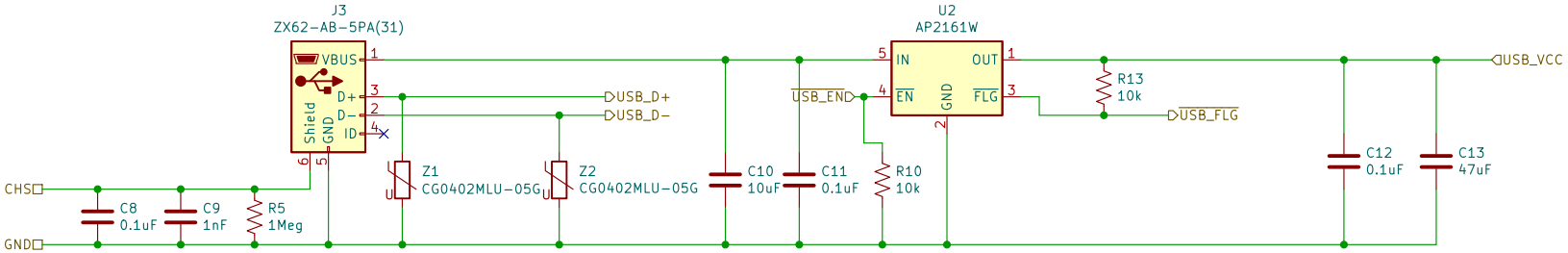
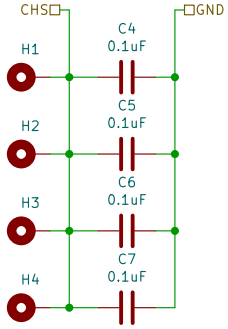
Title:

Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad (6.0.4)		Id: 2/25

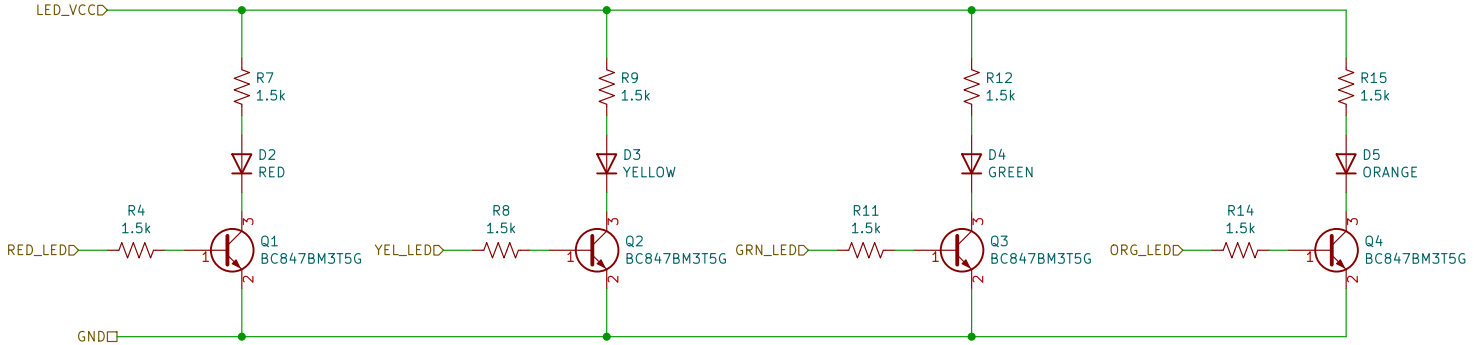
USB protection and power switch



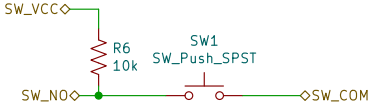
Mounting Holes



LEDs



Switch



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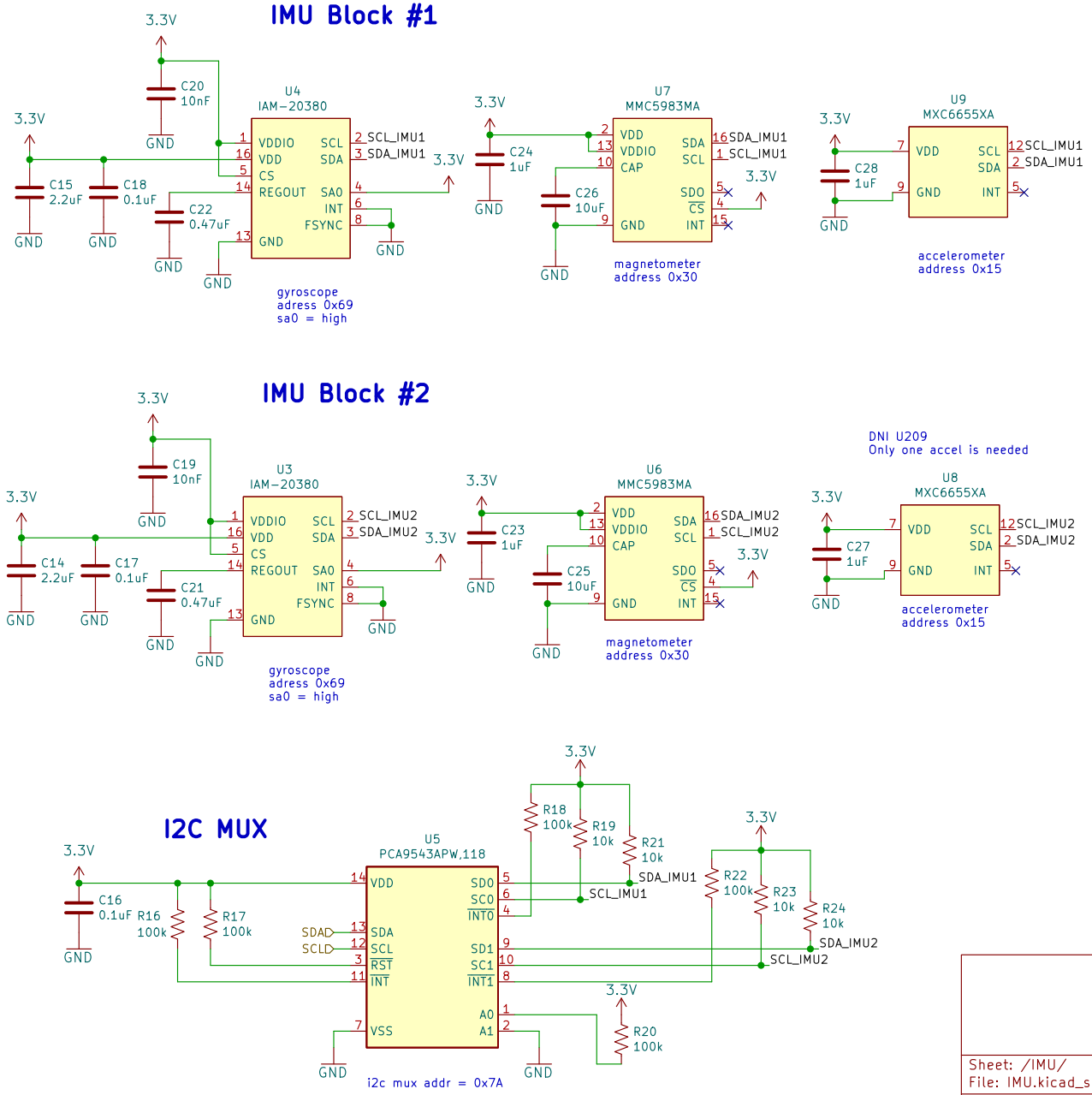
KiCad E.D.A. kicad (6.0.4)		Id: 3/25


IMU Block #1
3.3V
C20
10nF
GND
U4
IAM-20380
VDDIO
VDD
CS
REGOUT
SCL
SDA
SA0
INT
FSYNC
GND
SCL_IMU1
SDA_IMU1
C15
2.2uF
C18
0.1uF
C22
0.47uF
gyroscope
adress 0x69
sa0 = high
U7
MMC5983MA
VDD
VDDIO
CAP
SDO
CS
C24
1uF
C26
10uF
magnetometer
address 0x30
U9
MXC6655XA
C28
1uF
accelerometer
address 0x15
IMU Block #2
U3
IAM-20380
SCL_IMU2
SDA_IMU2
C19
10nF
C14
2.2uF
C17
0.1uF
C21
0.47uF
U6
MMC5983MA
C23
1uF
C25
10uF
DNI U209
Only one accel is needed
U8
MXC6655XA
C27
1uF
I2C MUX
U5
PCA9543APW,118
VDD
SDA
SCL
RST
INT
SD0
SC0
INT0
SD1
SC1
INT1
A0
A1
VSS
SDAD
SCLD
C16
0.1uF
R16
100k
R17
100k
R18
100k
R19
10k
R21
10k
R22
100k
R23
10k
R24
10k
R20
100k
i2c mux addr = 0x7A
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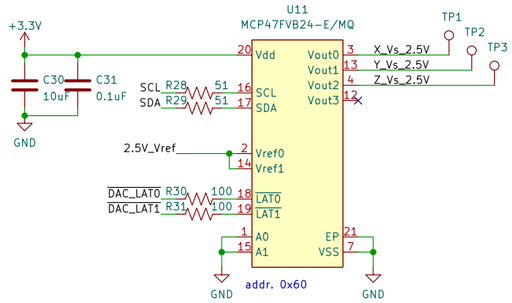
Size: A4
Date:
Rev:
KiCad E.D.A. kicad (6.0.4)
Id: 3/25

DAC STAGE

0–2.5Vout

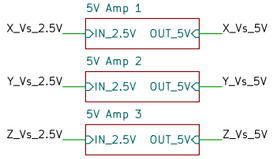
check for pulldowns on DAC lines



any way to get a super accurate 5V reference?
always a dropout voltage

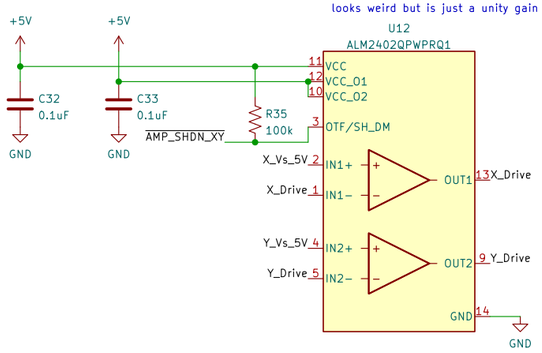
5V AMPLIFIER

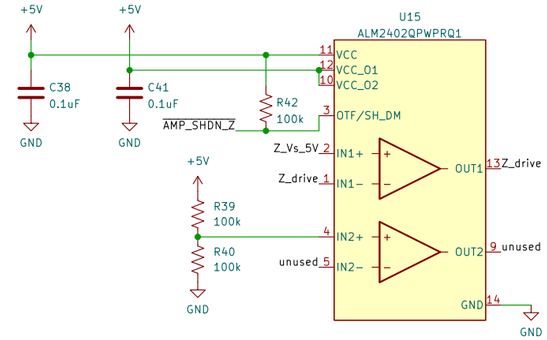
0–5Vout
take 0–2.5V DAC signal to 0–5V



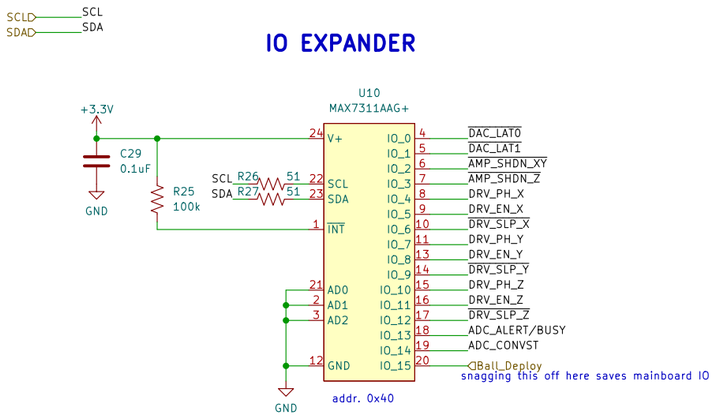
DRIVE AMPLIFIER

Magnetotorquer voltage source
just a high current op amp as a unity buffer
looks weird but is just a unity gain buffer





IO EXPANDER



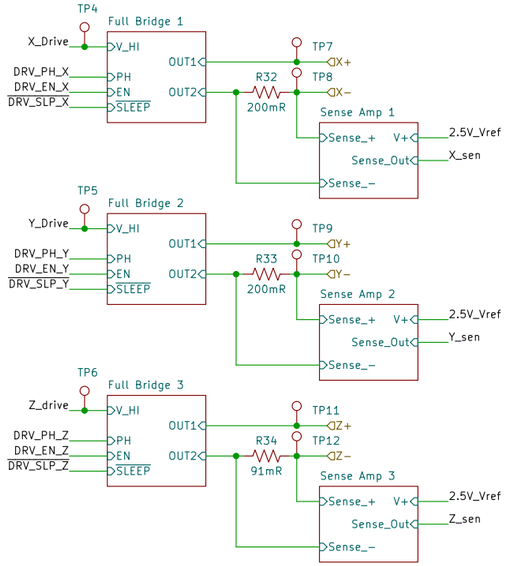
snagging this off here saves mainboard IO

1.3.1 Technical specification

Parameter	Typical Value	Comments
Environmental Characteristics		
Qualified operational temperature range	-40 to +70°C	
Storage temperature range	-50 to +85°C (RH<60%)	
Electrical Characteristics		
Torquer supply voltage (design)	5V	
Nominal magnetic dipole (per actuator)	0.2 Am^2	
Actuation power (rods)	0.2 W	5V, 20 C, 0.2 Am^2
Actuation power (air core)	0.57 W	5V, 20 C, 0.2 Am^2
Temperature sensor current consumption	<150 uA	
Physical Characteristics		
Dimensions (Main)	95.9 x 90.1 mm	
External height	15 mm	
Weight	194 grams	

Table 1-2 iMTQ Overall Specification

HALF BRIDGE DRIVER & CURRENT SENSE

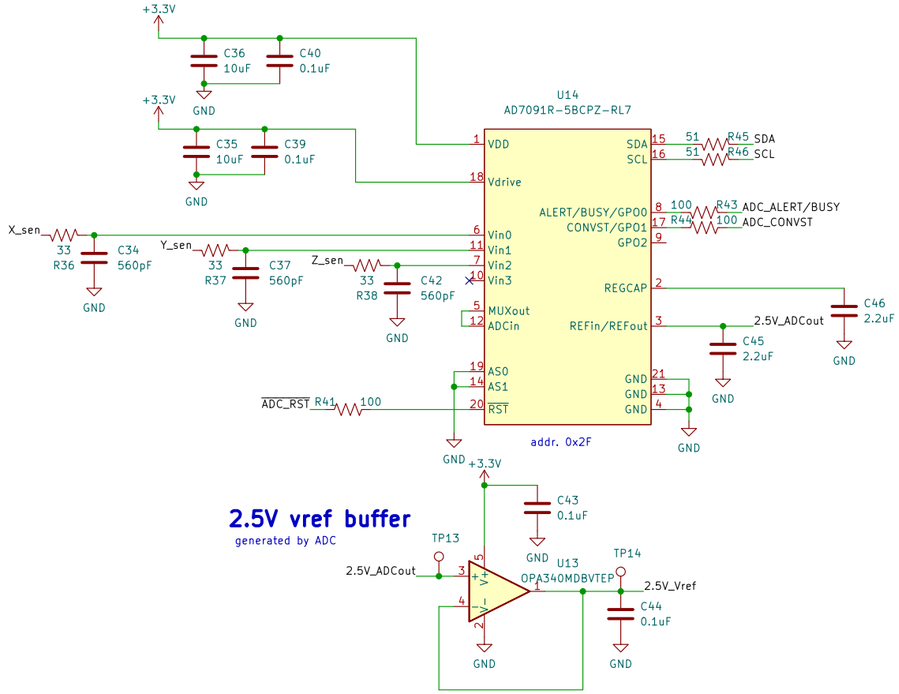


max rod current = 50mA
max air core current = 110mA
max current will be flowing both directions
biased at mid supply
lets say current will cause a +/− 1.0v defelection

r_rod = 1/(50mA)/100 = 200mR
r_air = 1/110mA/100 = 91mR

update me!

CURRENT SENSE ADC



2.5V vref buffer

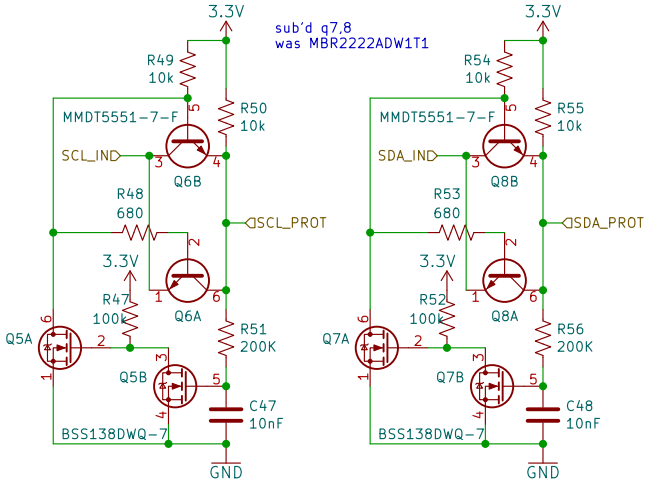
generated by ADC

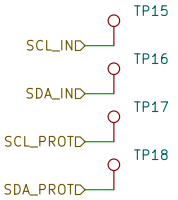
Sheet: /Magnetotorquer Drivers/
File: magnetotorquer-driver.kicad_sch

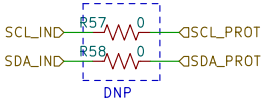
Title:

Size: B	Date:	**Rev:**
KiCad E.D.A. kicad (6.0.4)		Id: 4/25

I2C Bus Protection PIB







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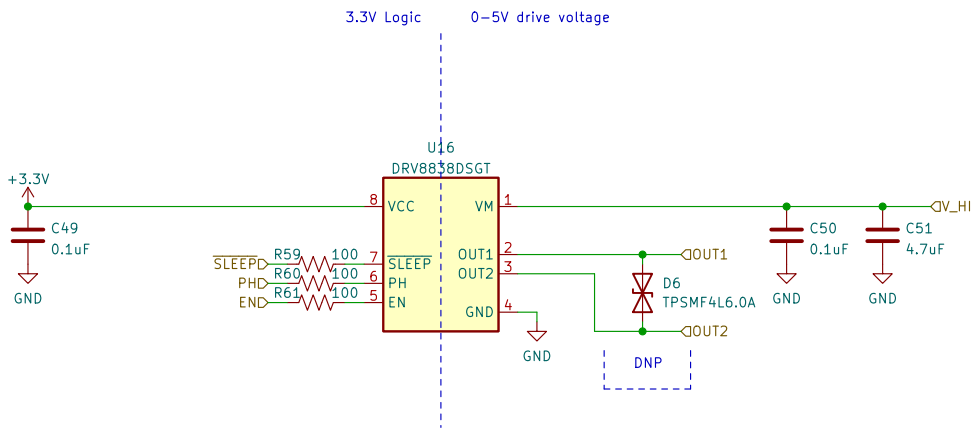

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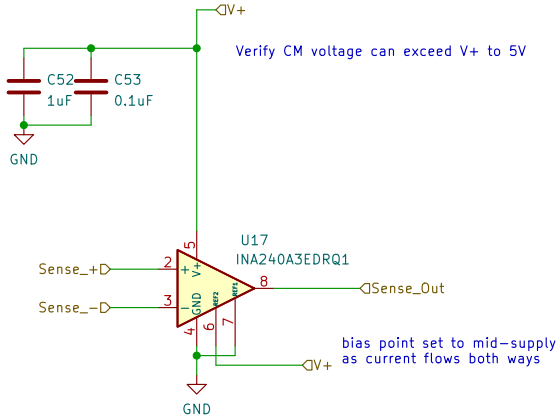

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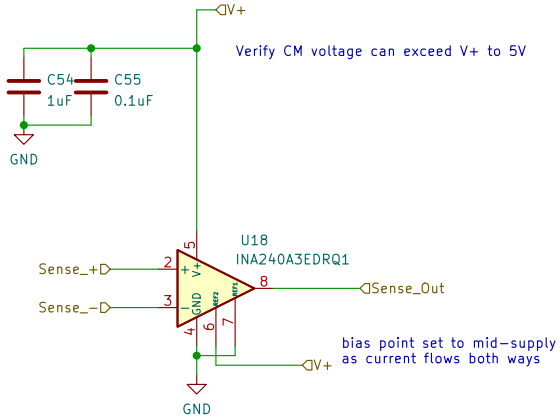

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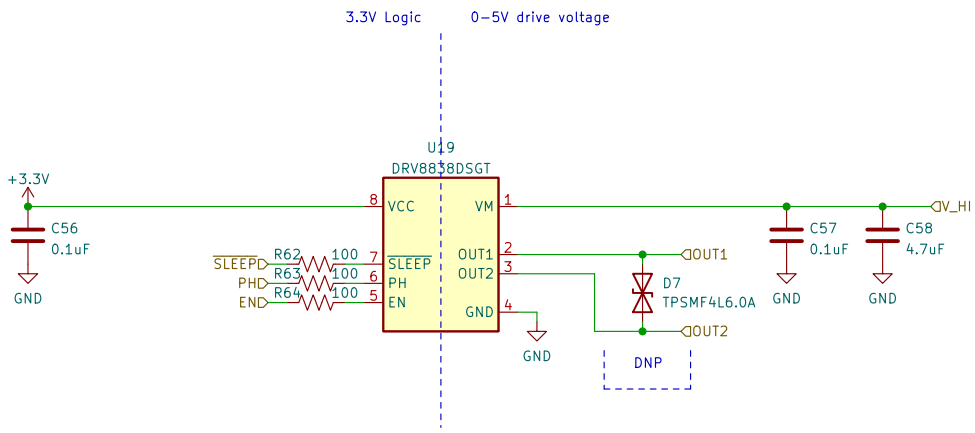

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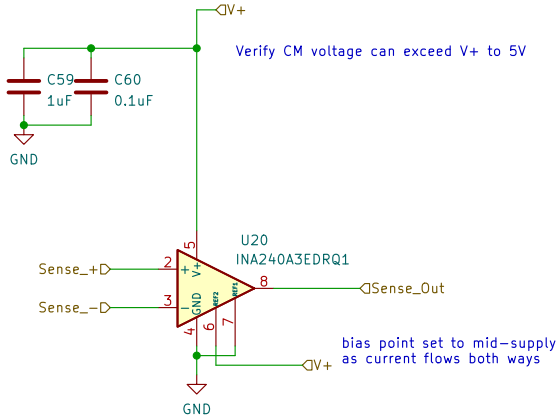

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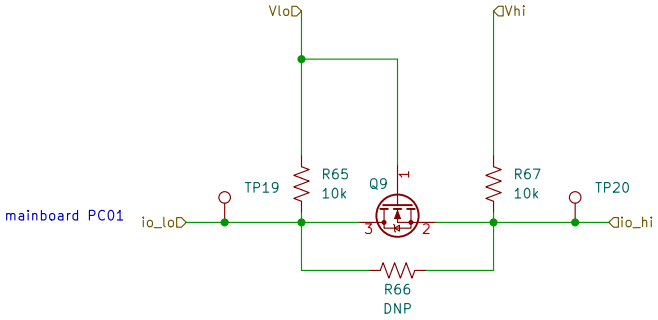

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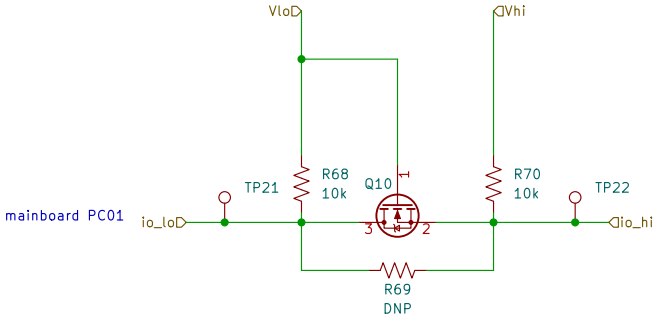

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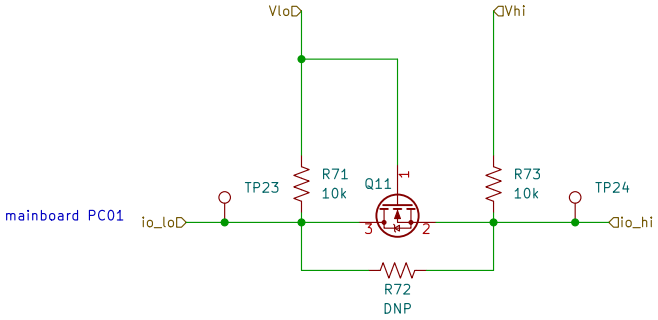

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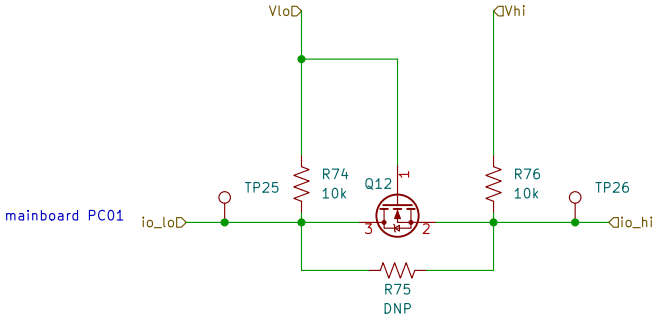

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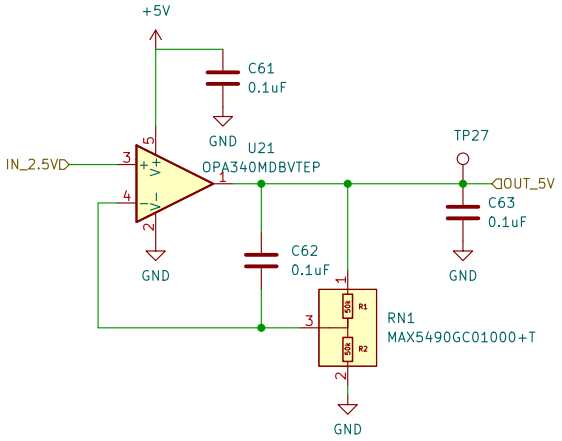

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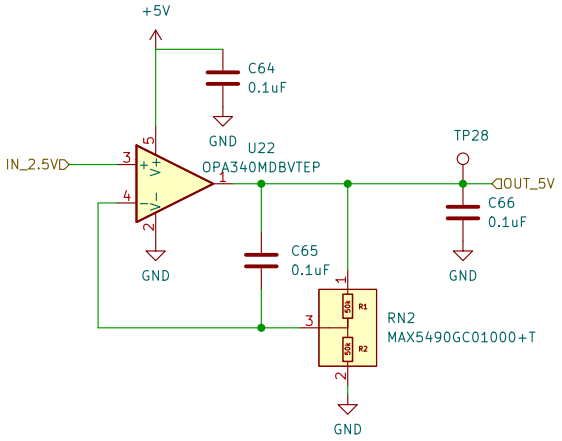

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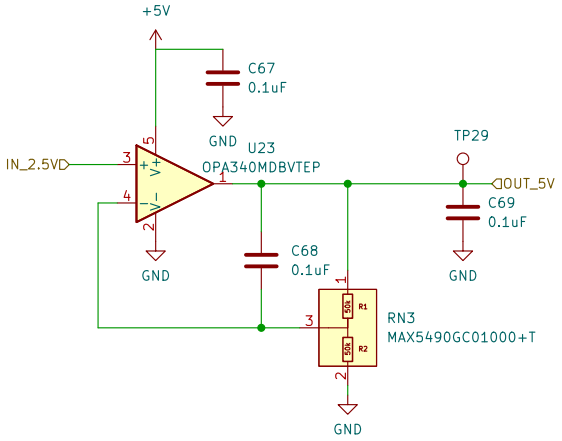

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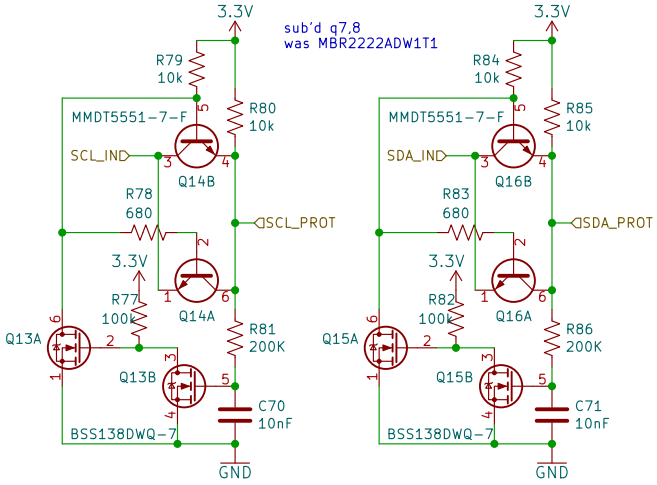
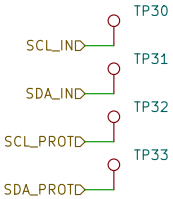
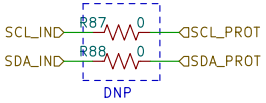
I2C Bus Protection PIB







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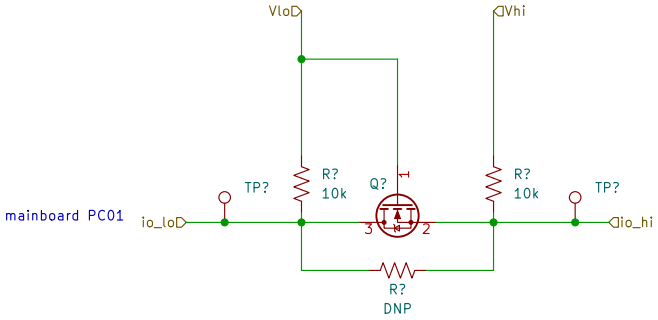

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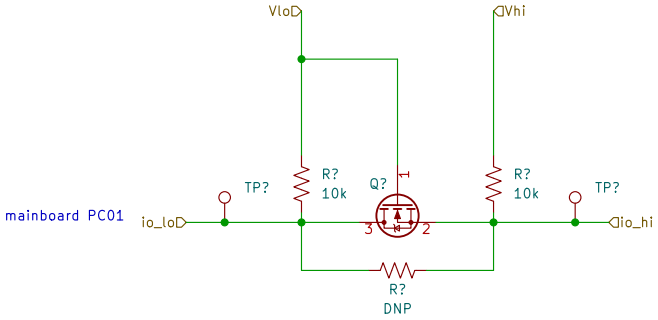

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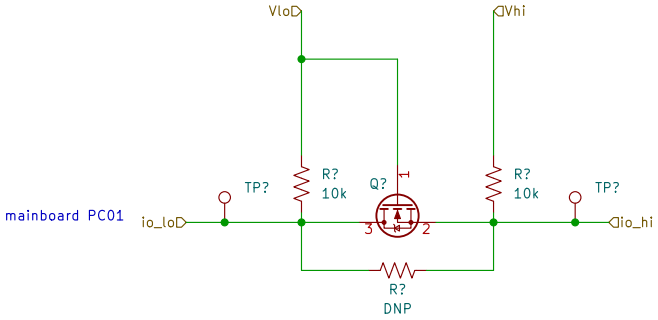

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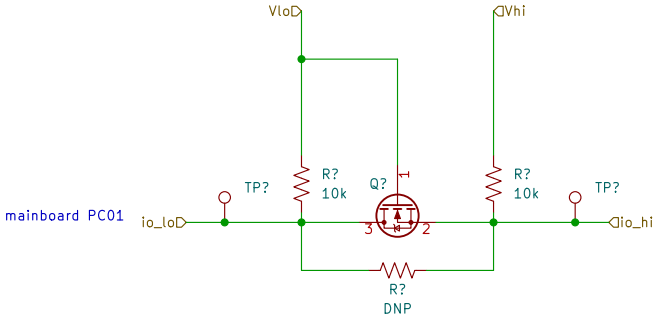

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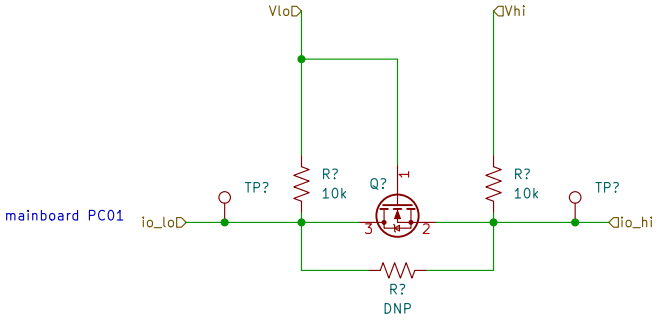

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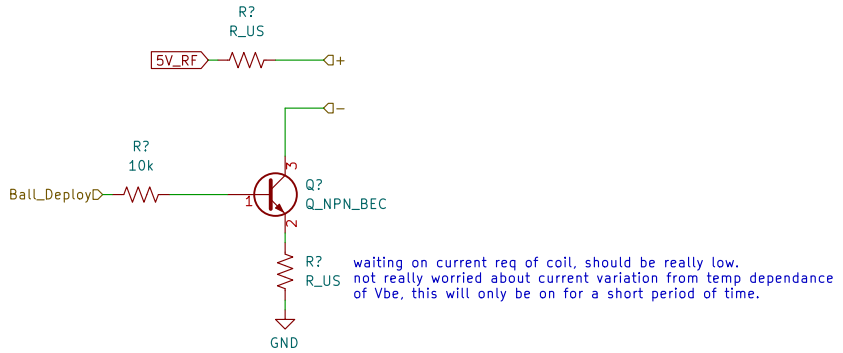

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