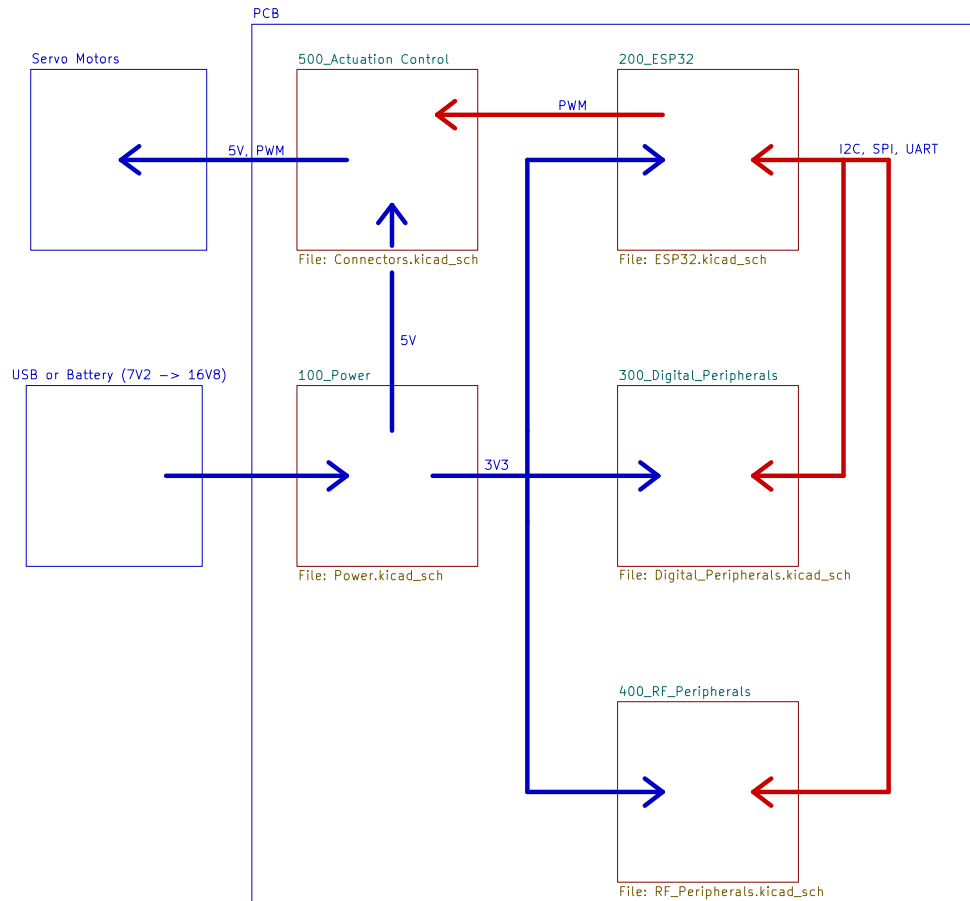


## Project Block Diagram



## Project Goals:

- Be able to power 8 servos plus all on board electronics.
- Have power switching between USB and Battery.
- Have long range radio for communication.
- Use GPS, barometer, magnetometer, gyroscope, and accelerometer to perform sensor fusion.
- Use JTAG for debugging embedded software.
- Be programmable through the ESP-IDF programming framework.
- Able to be used in a variety of robotic systems e.g. a quadrupedal robot.

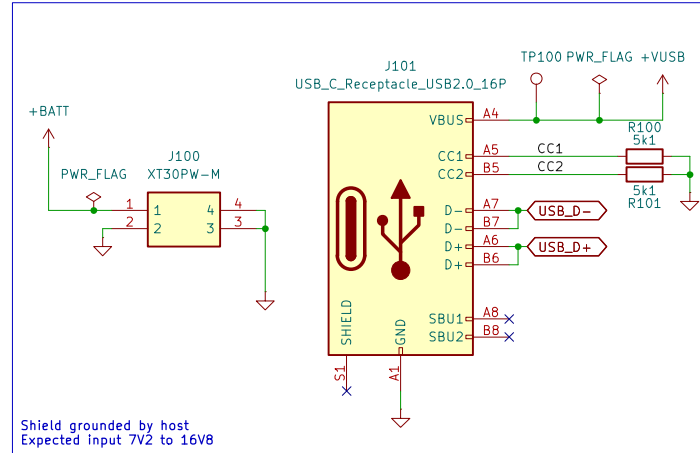
Sheet: /  
File: Summer2025.kicad\_sch

### Title: Project Outline

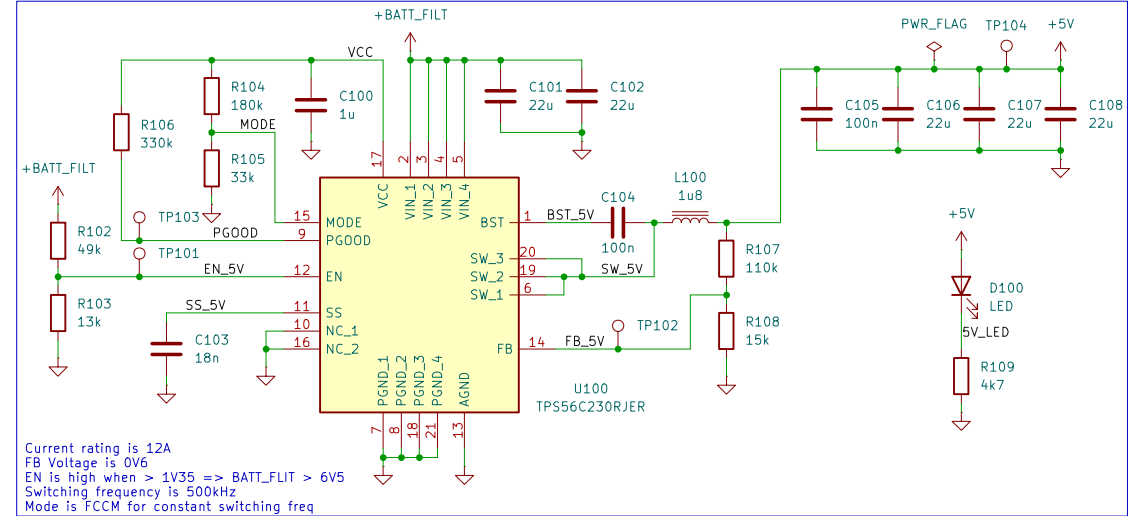
Size: A4 Date: 25-05-2025  
KiCad E.D.A. 9.0.1

Rev: 0.0.1  
Id: 1/6

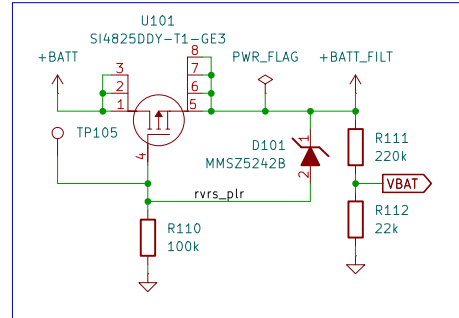
## USB and battery



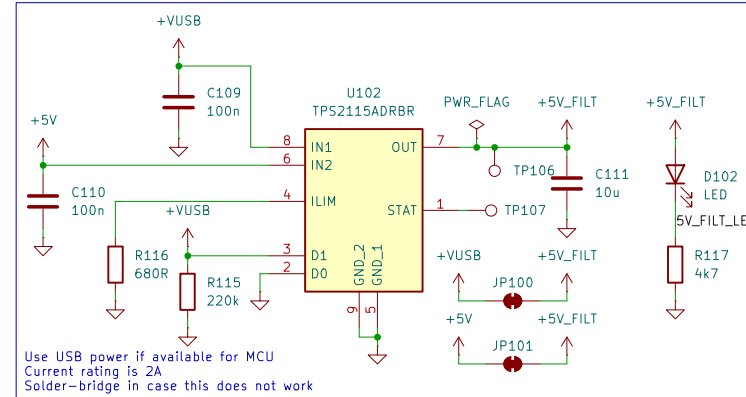
## 5V Switching Regulator



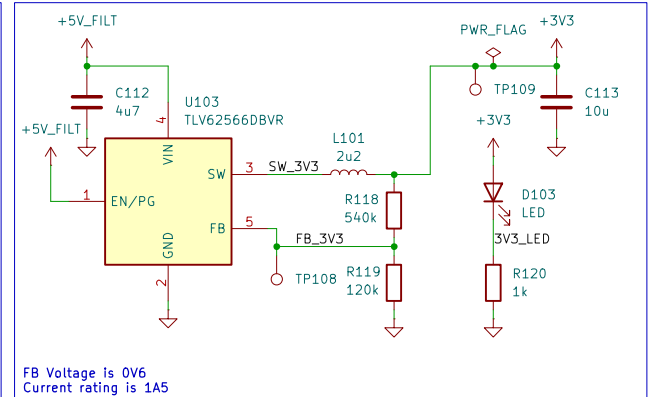
## Reverse polarity protection



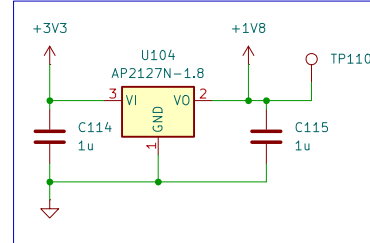
## 5V Power switching



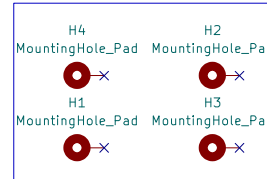
## 3V3 Switching Regulator



## 1V8 Linear Regulator



## Mounting



Sheet: /100\_Power/  
File: Power.kicad\_sch

**Title: Power Delivery**

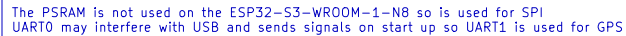
Size: A4 Date: 07-05-2025

KiCad E.D.A. 9.0.1

**Rev: 0.0.1**

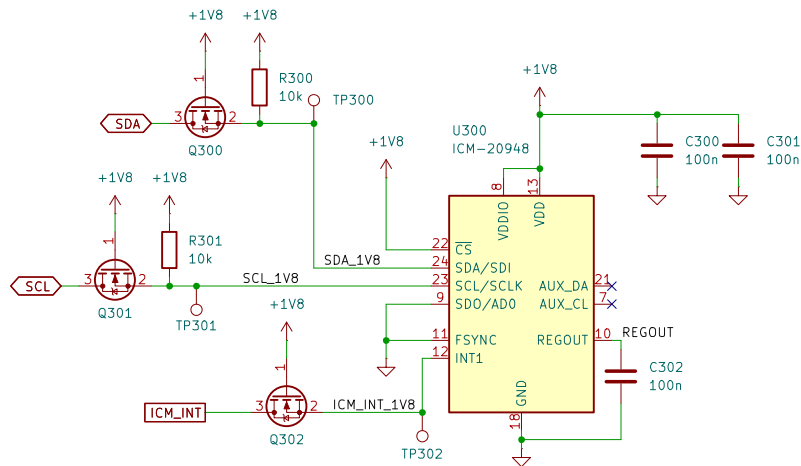
Id: 2/6

## ESP32-S3



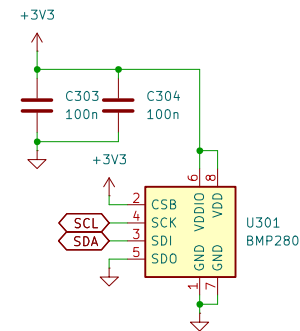
Rev: 0.0.1  
Id: 3/6

## ICM-20948 IMU I2C



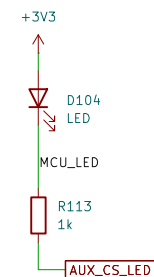
ICM-20948 uses 1V8 logic NOT 3V3  
I2C address is 0x68

## BMP280 I2C

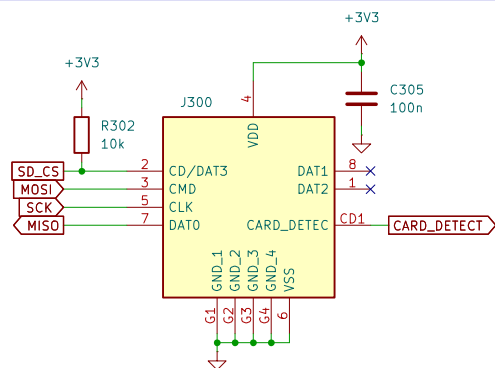


I2C address is 0x76

## LED



## SD Card SPI



Sheet: /300\_Digital\_Peripherals/  
File: Digital\_Peripherals.kicad\_sch

**Title: Digital Peripherals**

Size: A4 Date: 17-05-2025  
KiCad E.D.A. 9.0.1

**Rev: 0.0.1**  
Id: 4/6

[illegible]

U401  
RFM95W-868S2

3V3

C403  
10u

SCK  
MOSI  
MISO  
LORA\_CS  
LORA\_RST  
RESET  
ANT  
DI05  
DI04  
DI03  
DI02  
DI01  
DI00  
GND  
GND

J402

LORA\_ANT

1  
2

1  
2  
3  
4  
5  
6  
7  
8  
9  
10

13  
14  
15  
16  
17  
18  
19  
20

21  
22  
23  
24  
25  
26  
27  
28  
29  
30

31  
32  
33  
34  
35  
36  
37  
38  
39  
40

41  
42  
43  
44  
45  
46  
47  
48  
49  
50

51  
52  
53  
54  
55  
56  
57  
58  
59  
60

61  
62  
63  
64  
65  
66  
67  
68  
69  
70

71  
72  
73  
74  
75  
76  
77  
78  
79  
80

81  
82  
83  
84  
85  
86  
87  
88  
89  
90

91  
92  
93  
94  
95  
96  
97  
98  
99  
100

101  
102  
103  
104  
105  
106  
107  
108  
109  
110

111  
112  
113  
114  
115  
116  
117  
118  
119  
120

121  
122  
123  
124  
125  
126  
127  
128  
129  
130

131  
132  
133  
134  
135  
136  
137  
138  
139  
140

141  
142  
143  
144  
145  
146  
147  
148  
149  
150

151  
152  
153  
154  
155  
156  
157  
158  
159  
160

161  
162  
163  
164  
165  
166  
167  
168  
169  
170

171  
172  
173  
174  
175  
176  
177  
178  
179  
180

181  
182  
183  
184  
185  
186  
187  
188  
189  
190

191  
192  
193  
194  
195  
196  
197  
198  
199  
200

201  
202  
203  
204  
205  
206  
207  
208  
209  
210

211  
212  
213  
214  
215  
216  
217  
218  
219  
220

221  
222  
223  
224  
225  
226  
227  
228  
229  
230

231  
232  
233  
234  
235  
236  
237  
238  
239  
240

241  
242  
243  
244  
245  
246  
247  
248  
249  
250

251  
252  
253  
254  
255  
256  
257  
258  
259  
260

261  
262  
263  
264  
265  
266  
267  
268  
269  
270

271  
272  
273  
274  
275  
276  
277  
278  
279  
280

281  
282  
283  
284  
285  
286  
287  
288  
289  
290

291  
292  
293  
294  
295  
296  
297  
298  
299  
300

301  
302  
303  
304  
305  
306  
307  
308  
309  
310

311  
312  
313  
314  
315  
316  
317  
318  
319  
320

321  
322  
323  
324  
325  
326  
327  
328  
329  
330

331  
332  
333  
334  
335  
336  
337  
338  
339  
340

341  
342  
343  
344  
345  
346  
347  
348  
349  
350

351  
352  
353  
354  
355  
356  
357  
358  
359  
360

361  
362  
363  
364  
365  
366  
367  
368  
369  
370

371  
372  
373  
374  
375  
376  
377  
378  
379  
380

381  
382  
383  
384  
385  
386  
387  
388  
389  
390

391  
392  
393  
394  
395  
396  
397  
398  
399  
400

401  
402  
403  
404  
405  
406  
407  
408  
409  
410

411  
412  
413  
414  
415  
416  
417  
418  
419  
420

421  
422  
423  
424  
425  
426  
427  
428  
429  
430

431  
432  
433  
434  
435  
436  
437  
438  
439  
440

441  
442  
443  
444  
445  
446  
447  
448  
449  
450

451  
452  
453  
454  
455  
456  
457  
458  
459  
460

461  
462  
463  
464  
465  
466  
467  
468  
469  
470

471  
472  
473  
474  
475  
476  
477  
478  
479  
480

481  
482  
483  
484  
485  
486  
487  
488  
489  
490

491  
492  
493  
494  
495  
496  
497  
498  
499  
500

501  
502  
503  
504  
505  
506  
507  
508  
509  
510

511  
512  
513  
514  
515  
516  
517  
518  
519  
520

521  
522  
523  
524  
525  
526  
527  
528  
529  
530

531  
532  
533  
534  
535  
536  
537  
538  
539  
540

541  
542  
543  
544  
545  
546  
547  
548  
549  
550

551  
552  
553  
554  
555  
556  
557  
558  
559  
560

561  
562  
563  
564  
565  
566  
567  
568  
569  
570

571  
572  
573  
574  
575  
576  
577  
578  
579  
580

581  
582  
583  
584  
585  
586  
587  
588  
589  
590

591  
592  
593  
594  
595  
596  
597  
598  
599  
600

601  
602  
603  
604  
605  
606  
607  
608  
609  
610

611  
612  
613  
614  
615  
616  
617  
618  
619  
620

621  
622  
623  
624  
625  
626  
627  
628  
629  
630

631  
632  
633  
634  
635  
636  
637  
638  
639  
640

641  
642  
643  
644  
645  
646  
647  
648  
649  
650

651  
652  
653  
654  
655  
656  
657  
658  
659  
660

661  
662  
663  
664  
665  
666  
667  
668  
669  
670

671  
672  
673  
674  
675  
676  
677  
678  
679  
680

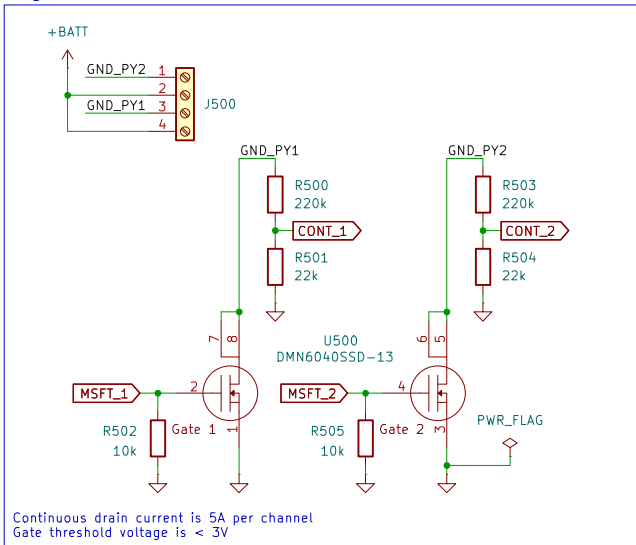
681  
682  
683  
684  
685  
686  
687  
688  
689  
690

691  
692  
693  
694  
695  
696  
697  
698  
699  
700

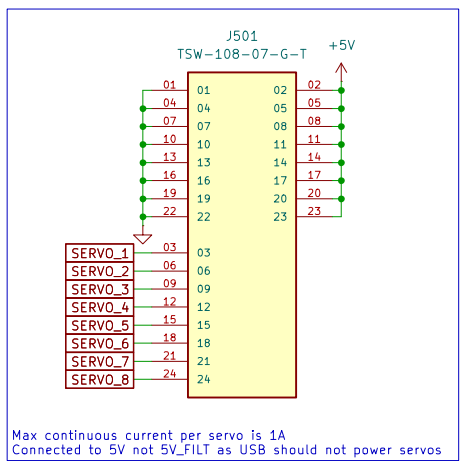
701  
702  
703  
704  
705  
706  
707  
708  
709  
710

711  
712  
713  
714  
715

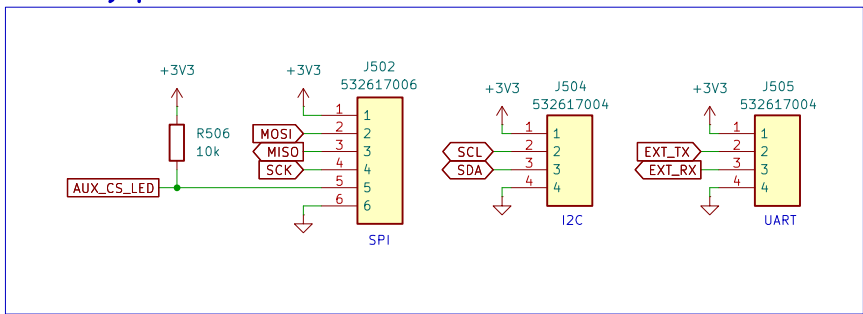
# High current switches



# Servo connectors



# Auxillary picoblade connectors



Sheet: /500\_Actuation Control/  
File: Connectors.kicad\_sch

## Title: Actuator Outputs

Size: A4 Date: 08-05-2025  
KiCad E.D.A. 9.0.1

Rev: 0.0.1  
Id: 6/6