

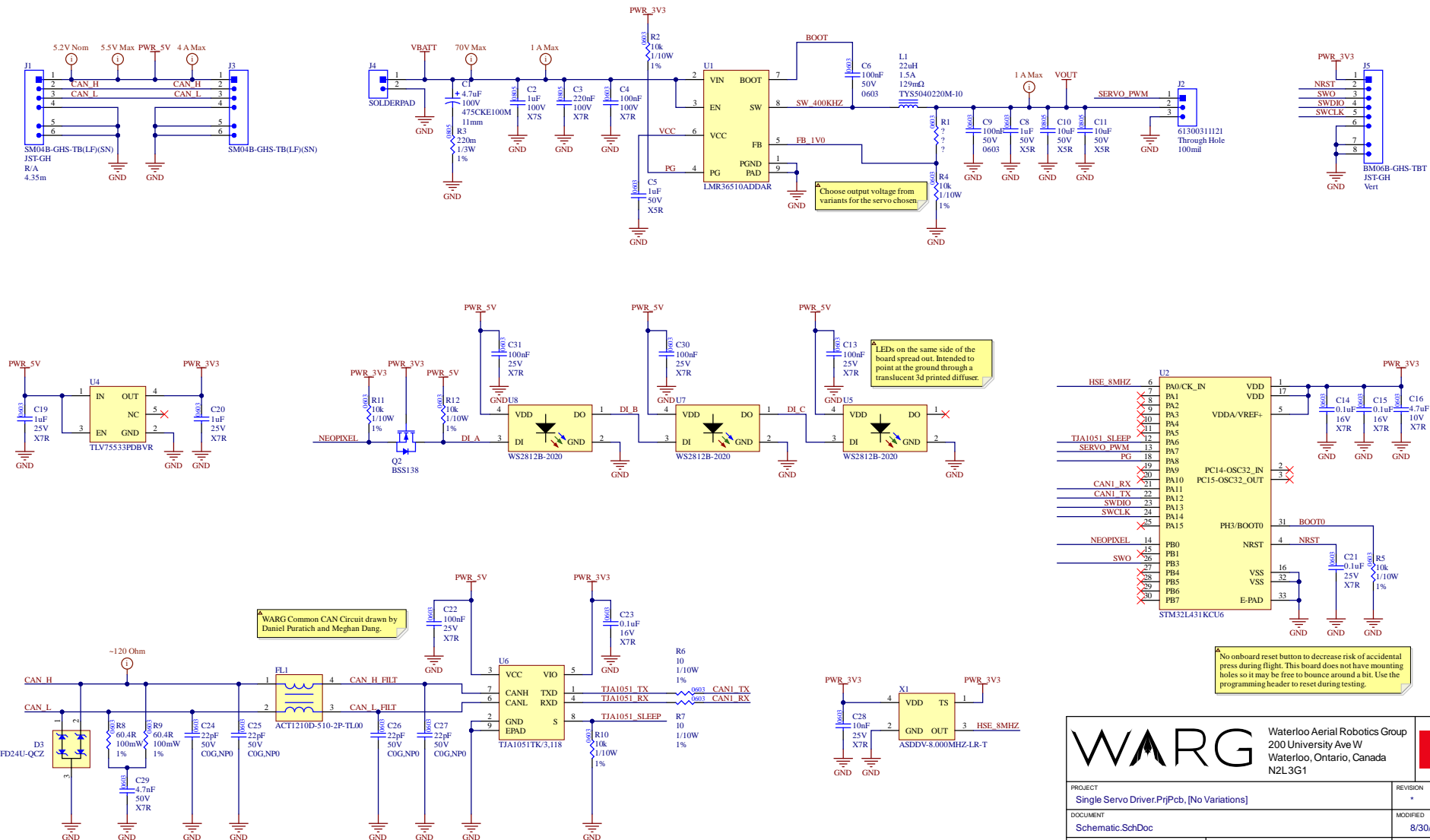
Use Case:
This board is designed for a single aileron current servo in the wing, 6S Servo Module design by Meghan Dang is preferred for all the servos in the tail of the upcoming fixed wing but also for any location that we choose multiple lower current servos (i.e. a multi axis gimbal). It's tough to tell exactly what we'll need in the future so having different boards for different applications seems like a nice to have.

Missing Features:
No mounting holes, no voltage/current sense, and no LEDs on every rail was chosen to save space within the wing. These more complicated features are done on WARG's larger servo module PCBAs. This board is intended to be embedded in close proximity with servo and could be double sided sticky taped to the side of the servo. If these features end up being desired, another revision should be done.

Single Servo Driver

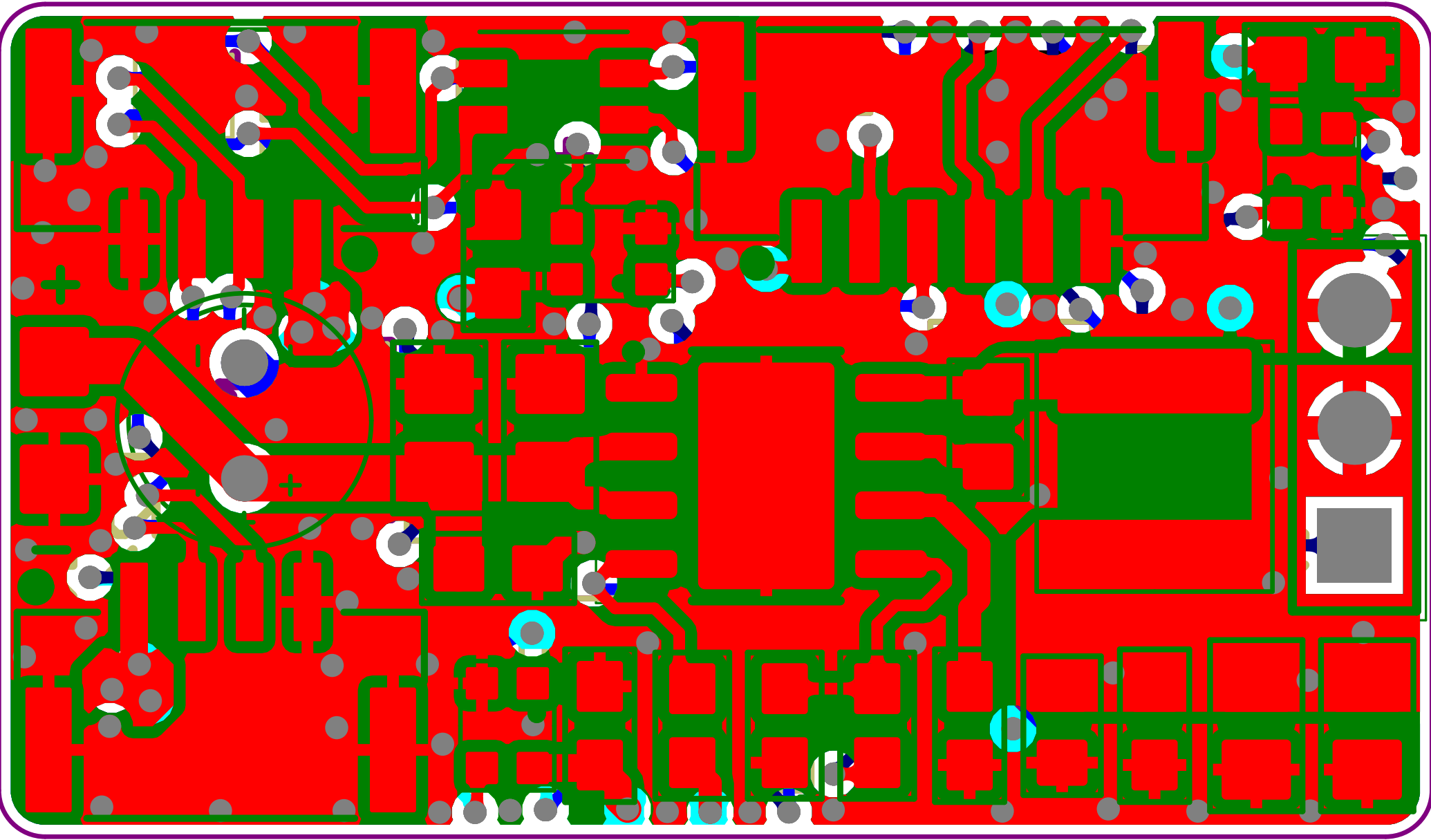
CAN Information:
Connectors follow DS-009 Pichawk Connector Standard. For wiring and twisting instruction refer to PX4 - Cable Wiring Basics - UAVcan Cable. Either wire color option is permissible for WARG systems. Termination is optional. PCBA will not be impedance controlled to save cost, but timing matching will be observed as best as possible on this board. Common WARG CAN circuit is used on this PCBA.

Layout:
All tall components are on the top side along with the LEDs. The top side is meant to face down toward the ground. The back side has all the lower components and is meant to have it's back to the servo. The warmest components are also placed on the bottom side though this was low priority as this board is very low power. Six layers was chosen to make routing easier on a smaller PCBA.



WARG
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PROJECT Single Servo Driver.PrjPcb, [No Variations]	REVISION *
DOCUMENT Schematic.SchDoc	MODIFIED 8/30/2024
ENGINEER Daniel Puratich	REVIEWER *
SHEET * OF *	



Comment	Description	Designator	Footprint	LibRef	Quantity
475CKE100M	CAP ALUM 4.7UF 20% 100V RADIAL	C1	475CKE100M-Footprint-1	CMP-00301-1	1
GRM21BC72A105KE01L	CAP CER 1UF 100V X7S0805	C2	.CAP_0805-Footprint-1	CMP-00124-2	1
CL21B224KCF5NWE	CAP CER 0.22UF 100V X7R0805	C3	.CAP_0805-Footprint-1	CMP-00299-1	1
CC0603KRX7R0BB104	CAP CER 0.1UF 100V X7R0603	C4	.CAP_0603-Footprint-1	CMP-00249-4	1
GRT188R61H105KE13D	CAP CER 1UF 50V X5R0603	C5, C8	.CAP_0603-Footprint-1	CMP-00096-4	2
CL10B104KB8NNNC	CAP CER 0.1uF 50V X7R0603	C6, C9	CL10B104KB8NNNC-Footprint-1	CMP-00018-6	2
GRM21BR61H106KE43L	CAP CER 10uF 50V X5R0805	C10, C11	.CAP_0805-Footprint-1	CMP-001-00027-2	2
CL10B104KA8NNNC	CAP CER 0.1UF 25V X7R0603	C13, C22, C30, C31	.CAP_0603-Footprint-1	CMP-00057-2	4
GCM188R71C104KA37D	CAP CER 100nF 16V X7R0603	C14, C15, C23	.CAP_0603-Footprint-1	CMP-001-00003-9	3
GRM188Z71A475KE15J	CAP CER 4.7UF 10V X7R0603	C16	.CAP_0603-Footprint-1	CMP-001-00045-2	1
GCM188R71E105KA64D	CAP CER 1UF 25V X7R0603	C19, C20	.CAP_0603-Footprint-1	CMP-00240-2	2
GCM188R71E104KA12D	CAP CER 0.1UF 25V X7R0603	C21	.CAP_0603-Footprint-1	CMP-001-00036-3	1
CC0603JRNPO9BN220	CAP CER 22PF 50V COG/NPO 0603	C24, C25, C26, C27	.CAP_0603-Footprint-1	CMP-00246-3	4
CC0603KRX7R8BB103	CAP CER 10nF 25V X7R0603	C28	.CAP_0603-Footprint-1	CMP-00217-1	1
GCM188R71H472KA37D	CAP CER 4700PF 50V X7R0603	C29	.CAP_0603-Footprint-1	CMP-001-00080-1	1
PESD2CANFD24U-QCZ	TVS DIODE 24VWM 43VC DFN1412D-3	D3	PESD2CANFD24U-QCZ-Footprint-1	CMP-00239-5	1
ACT1210D-510-2P-TL00	CMC 50UH 115MA 2LN 2.3KOHMSMD	FL1	ACT1210D-510-2P-TL00-Footprint-1	CMP-00243-2	1
SM04B-GHS-TB(LF)(SN)	Conn Shrouded Header HDR 4 POS 1.25mm Solder RA SMD Reel	J1, J3	CONN_SM04B-GHS-TB_JST	CMP-068-000000-5	2
61300311121	CONN HDR 3 POS 2.54	J2	61300311121	CMP-001111-3	1
SOLDERPAD	Solder Pad 2 Pins, 2.54mm pitch, 1.27mm pad size	J4	SOLDERPAD_2PIN-Footprint	CMP-00296-1	1
BM06B-GHS-TBT	Connector Header Surface Mount 6 position 0.049" (1.25mm)	J5	BM06B-GHS-TBT-Footprint-1	CMP-002-00014-8	1
TVS5040220M-10	FIXED IND 22UH 1.5A 129 MOHM SMD	L1	TVS5040220M-10-Footprint-1	CMP-00298-2	1
BSS138	MOSFET N-CH 50V 220MA SOT23-3	Q2	BSS138-Footprint-1	CMP-00295-2	1
.RES_0603	GENERIC 0603 RES	R1	.RES_0603-Footprint-1	CMP-009-00000-5	1
RC0603FR-0710KL	RES 10K OHM 1% 1/10W 0603	R2, R4, R5, R10, R11, R12	.RES_0603-Footprint-1	CMP-009-00006-5	6
RL1220S-R22-F	RES 0.22 OHM 1% 1/3W 0805	R3	.RES_0805-Footprint-1	CMP-00300-1	1
RC0603FR-0710RL	RES 10 OHM 1% 1/10W 0603	R6, R7	.RES_0603-Footprint-1	CMP-009-00084-2	2
RC0603FR-1360R4L	RES 60.4 OHM 1% 1/10W 0603	R8, R9	RES0603	CMP-00245-1	2
LMR36510ADDAR	IC REG BUCK ADJ 1A 8SOPWR	U1	LMR36510ADDAR_8SOPWR	CMP-00297-1	1
STM32L431KCU6	IC MCU 32BIT 256KB FLASH 32UQFPN	U2	STM32L431KCU6-Footprint-1	CMP-00224-5	1
TLV75533PDBVR	IC REG LINEAR 3.3V 500MA SOT23-5	U4	SOT-23-5	CMP-00225-4	1
WS2812B-2020	LED Neopixel 2mm	U5, U7, U8	WS2812B-2020-Footprint-1	CMP-00294-3	3
TJA1051TK/3,118	IC TRANSCEIVER HALF 1/1 8HVSON	U6	TJA1051TK_3,118-Footprint-1	CMP-00219-3	1
ASDDV-8.000MHZ-LR-T	OSC XO 8.000MHZ CMOS SMD	X1	ASDDV-8.000MHZ-LR-T-Footprint-1	CMP-00242-3	1