# T7 PROWLER / R14 GATOR

Changelog:

Q25010-SCH_revQ
Q25010-PCB_revT:
    Change naming convention to QXXXXX-SCH/PCB_revX
    Convert from OrCAD to Altium
    Change J17 and J18 to Q15020-040
    Change J7 to Q17010-004
    Change J11 to Q17010-003

PCB
BOM
Q25010-PCB_revT
PCB, PROWLER/GATOR

J1-S
BOM
Q17013-001

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1-Title.SchDoc

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|---|---|
| Rev: Q | Title: PROWLER/GATOR |
| Size: B | DISK, D LOWES, D CHINA, CYL, & GATOR |
| Document Number: Q25010-SCH | Engineer: A. Lam |
| Date: 8/6/2025 | Sheet 1 of 8 |

## CHIP SELECT DECODER

U1 74HCT154 — 3.3V; R14 10K; A, B, C, D; G1, G2

| | |
|---|---|
| CS0 | UNUSED |
| CS1 | |
| CS2 | SERIAL I/O |
| CS3 | LEDS |
| CS4 | ATC |
| CS5 | ESQUARED |
| CS6 | DIA |
| CS7 | MC33298 |
| CS9 | DISPLAY |

## SERIAL MUX

U57 74AHC1G86 — 3.3V; PROPELPWMFB

U76 LMV331 / SOT23-5 — VCC +5v; R84 5.11K OHMS; 3.3V

R163 0 OHMS DNI; R118 0 OHMS; R164 5.11K OHMS; MOSFET PCHAN -60V -0.18A 5 OHMS Q17; VBAT; R170 1M

## DISPLAY

VCC +5v; R2 10K; U2 74HCT595 — SDI, SDO, SHCLK, STRCLK, MR, OE, Q0–Q7, GND; MOSI3.3; SPICLK3.3; CS9; R1 10K; I7; I8

## FLASH MEMORY

U4 AT45DB081 — 3.3V; R5 10K; CS1; DNI; R9 10K; R10 1K; CS1

## DSP

U7 TMS320LF2406B — 3.3V; C1 10UF/10V; C2 10UF/10V; L1 FERR 220 OHMS 2A BEAD; C3 0.1UF; C4 4.7UF 16V; C5 0.1UF; C6 0.033UF; R8 8.2; C7 1.5UF; VCC +5v

| | |
|---|---|
| TP1, TP2 | |
| PLLF, PLLF2 | |
| C1 | |
| BATTERY VOLTAGE SENSE | ADCIN0 |
| THROTLE VOLTAGE | ADCIN1 |
| BRAKE VOLTAGE | ADCIN2 |
| ACTUATOR CRNT FBKD | ADCIN3 |
| PROPEL CRNT FBKD | ADCIN4 |
| BRUSH CRNT FDBK1 | ADCIN5 |
| BRUSH CRNT FDBK2 | ADCIN6 |
| VACFAN CRNT FDBK | ADCIN7 |
| KEY1 | ADCIN8 |
| KEY2 | ADCIN9 |
| KEY3 | ADCIN10 |
| KEY4 | ADCIN11 |
| KEY5 | ADCIN12 |
| KEY6 | ADCIN13 |
| KEY7 | ADCIN14 |
| | ADCIN15 |
| EMU0 | |
| EMU1/OFF | |
| TCK | |
| TDI | |
| TDO | |
| TMS | |
| TMS2 | |
| TRST | |
| RS | |
| PDPINTA | |
| XINT1/IOPA2 | |
| XINT2/ADCSOC/IOPD0 | |
| CLKOUT/IOPE0 | |
| PDPINTB | |
| XTAL1/CLKIN | |
| XTAL2 | |
| BOOT_EN/XF | |
| CAP1/QEP1/IOPA3 | ACTUATORPWMFB |
| CAP2/QEP2/IOPA4 | VACFAN PWMFB |
| CAP3/IOPA5 | |
| PWM1/IOPA6 | PWM1 |
| PWM2/IOPA7 | ACTUATORDIR |
| PWM3/IOPB0 | ACTUATORPWM |
| PWM4/IOPB1 | RTS_SG |
| PWM5/IOPB2 | BRUSHPWM2 |
| PWM6/IOPB3 | CTS_SG |
| T1PWM/T1CMP/IOPB4 | PWM2 |
| T2PWM/T2CMP/IOPB5 | PROPDIR |
| TDIRA/IOPB6 | |
| TCLKINA/IOPB7 | XTRA_1CPU |
| | ODOMPLS_CPU |
| CAP4/QEP3/IOPE7 | BRUSHPWMFB1 |
| CAP5/QEP4/IOPF0 | BRUSHPWMFB2 |
| CAP6/IOPF1 | |
| PWM7/IOPE1 | BRUSHPWM1 |
| PWM8/IOPE2 | |
| PWM9/IOPE3 | PROPELLPWM |
| PWM10/IOPE4 | FAULT1 |
| PWM11/IOPE5 | VACFAN PWM |
| PWM12/IOPE6 | |
| T3PWM/T3CMP/IOPF2 | A |
| T4PWM/T4CMP/IOPF3 | B |
| TDIRB/IOPF4 | XTRA_2CPU |
| TCLKINB/IOPF5 | RDY |
| IOPC0 | |
| IOPF6 | WRITE PROTECT |
| IIO/IOPC1 | |
| CANRX/IOPC7 | C |
| CANTX/IOPC6 | D |
| SCITXD/IOPA9 | |
| SCIRXD/IOPA1 | |
| SPICLK/IOPC4 | SPICLK3.3 |
| SPISIMO/IOPC2 | MOSI3.3 |
| SPISOMI/IOPC3 | MISO3.3 |
| SPISTE/IOPC5 | |

## POWER

J2 F. HEADER 7x2 thru hole; J1 JUMPER1; R29 1K; DNI CAPACITOR RETAINER CLIP 30137-0

U11 TPS3619 — 2.7V BNSW; 3.3V; R151 0 OHMS; C14 0.1UF; J4 TEST POINT; DNI BATTERY 2.7 VOLTS 30137-0; VBAT; BAT BACKUP; RESET 3.3; POWER GOOD; R155 0 OHMS /RESET; R22 4.75K; R23 4.75K; R298 4.75K; R26 4.75K; R27 4.75K; R28 10K; R296 10K; XINT1; XINT2; CLOCK_7MHZ

U18 OSC_SM_SG636 — 3.3V; R31 4.75K; R82 1K; J16 3posjump

D4 LED — R35 200

U22 74AHC1G86 — 3.3V

## LEVEL TRANSLATION

U19 74CBTD3306PW — VCC +5v; MISO3.3; MISO5; CS4; SPICLK3.3; MOSI3.3; MISO3.3; BAT BACKUP; R34 10K; R3 100K; WRITE PROTECT

U13 74AHCT1G86 — MOSI5

U15 74AHCT1G86 — SPICLK5

## RTC

U23 MAX6902 — DNI; SCLK, CE, DIN, DOUT, X1, X2, VCC, GND; Y1 FSM 327

## FRAM

U21 FM25CL64 — SI, SCLK, HOLD, WP, CS, SO, VCC, GND; CS5; R36 10K; R37 10K; 3.3V

## D/A

U16 MAX5258 — VCC +5v; LDAC, REF, CS, SCLK, DIN, DOUT; CS6; SPICLK5; MOSI5; OUTA, OUTB, OUTC, OUTD, OUTE, OUTF, OUTG, OUTH

| | |
|---|---|
| OUTA | ACTUATOR CRNT REF |
| OUTB | BRUSH CRNT REF1 |
| OUTC | BRUSH CRNT REF2 |
| OUTD | PROPEL CRNT REF |
| OUTE | |
| OUTF | VACFAN CRNT REF |

U20A OPA2340 — R33 2.0K; ANALOG OUT 1; RV2 33 VOLT VARISTOR

U20B OPA2340 — R38 1K; ANALOG OUT 2; RV3 33 VOLT VARISTOR

## RS232

U77 MAX3232/SO_4 — 3.3V; C8 0.1UF; C9 0.1UF; C10 0.1UF; C11 0.1UF; R292 10K; RTS_SG; CTS_SG; R19 121; R20 121; R30 121; R86 121; SM712 D2; SM712 D15; J15 CON8

U75 MAX3232/SO_4 — DNI; C15 0.1UF; C13 0.1UF; C16 0.1UF; C12 0.1UF; R293 10K; R294 10K; R295 10K; R24 121; R25 121; R32 121; R86 121; T1_OUT; R1_IN; T2_OUT; R2_IN; SM712 D18; SM712 D19; DNI; J19 CON4; J20 CON4

U42 74LV4052A — VDD, X0–X3, X, Y, Y0–Y3, VEE, GND, EN, A, B; R85 10K; R87 10K; R178 10K; R172 1K; R180 10K; C16 0.1UF; C12 0.1UF; XINT1; XINT2

## DECOUPLING, +5V

C17 0.1UF; C18 0.1UF; C19 0.1UF; C20 0.1UF; C21 0.1UF; C22 0.1UF; C23 0.1UF; C24 0.1UF; C25 0.1UF; C26 0.1UF; C27 0.1UF

## DECOUPLING, +3.3V

C38 0.1UF; C39 0.1UF; C40 0.1UF; C41 0.1UF; C42 0.1UF; C43 0.1UF; C44 0.1UF; C45 0.1UF; C46 0.1UF; C47 0.1UF; C48 0.1UF; C49 0.1UF; C50 0.1UF; C51 0.1UF; C52 0.1UF

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2-Micro_and_Communication.SchDoc

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| Size | D |
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| | DISK, D LOWES, D CHINA, CYL, & GATOR |
| Document Number | Q25010-SCH |
| Engineer | A. Lam |
| Date: | 8/6/2025 |
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## POWER SUPPLY +5V

5V / 1A SWITCHING SUPPLY

KEY INPUT

D5 MBRD835L

RV1 V48MLA1210

C67 0.1UF

C68 47uf / 35V

C69 0.1UF

C64 0.1UF

U24 LM2676S-5.0 (VIN, GND, ON/OFF, BOOST, FB, OUT)

L2 33.0UH UP3B-330 Coiltronics UP3B-330

D6 SCHOT 1A 60V

C70 100UF TANT 16V

VCC_+5V

## POWER SUPPLY +3.3V

3.3V LOW DROPOUT LINEAR REGULATOR

TPS7133Q/SOIC U25 (IN, IN, FB/PG, EN, GND, OUT, OUT)

C65 0.1UF

R136 4.75K

R45 249K

C66 33UF

3.3V

POWER GOOD

## POWER SUPPLY +9V

9V /1.5A SWITCHING SUPPLY

C72 47uf / 35V

C73 0.1UF

C71 0.1UF

U26 LM2676S - ADJ (VIN, GND, ON/OFF, BOOST, FB, OUT)

R13 1K

R15 3.48K

R18 3K

L3 68.0uH 2.4A DO5022P-683 Coiltronics UP3B-680

D7 SCHOT 1A 60V

C74 100UF TANT 16V

VCC_+9V

POLARITY PROTECTED KEY INPUT

## BRAKE INPUT VOLTAGE

BRAKE INPUT VOLTAGE

R72 15.0K

R125 22.1K

C114 0.1UF

C115 0.47UF

R133 1.43K

3.3V

C102 0.1UF

U50A OPA2340

R135 332

BRAKE VOLTAGE

## PROPEL INPUT VOLTAGE

PROPEL INPUT VOLTAGE

R76 15.0K

R77 22.1K

C81 0.1UF

C82 0.47UF

R131 2.43K

3.3V

C78 0.1UF

U50B OPA2340

R75 332

THROTTLE VOLTAGE

## LED DRIVERS

VCC_+5V

R61 10K

C76 0.1UF

U28 74HCT595 (SDI, SHCLK, STRCLK, MR, OE, SDO, Q0–Q7, VCC, GND)

MOSI3.3

SPICLK3.3

CS3

C77 0.1UF

U29 74HCT595 (SDI, SHCLK, STRCLK, MR, OE, SDO, Q0–Q7, VCC, GND)

R134 4.75K

332 R57

332 R58

332 R59

332 R60

332 R62

332 R63

332 R64

332 R65

332 R66

332 R67

332 R68

332 R69

332 R70

332 R71

332 R73

332 R74

17 332 R236

18 332 R130

3.3V

R41 10K

R42 10K

R43 10K

R44 10K

R38 10K

R40 10K

R45 10K

R46 2.0K KEY1

R47 2.0K KEY2

R49 2.0K KEY3

R50 2.0K KEY4

R51 2.0K KEY5

R52 2.0K KEY6

R53 2.0K KEY7

BRAKE INPUT VOLTAGE

PROPEL INPUT VOLTAGE

VCC_+5v

F1 FUSE POLYSWITCH HOLD .35A / TRIP .7A

FUSED 5volts

DA1 TVS DIODE ARRAY Semtech SM5056C

DA2 TVS DIODE ARRAY Semtech SM5056C

J5 4599206-8

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3-Power_Supply.SchDoc

Rev Q

Size: D

Title: PROWLER/GATOR

DISK, D LOWES, D CHINA, CYL, & GATOR

Document Number Q25010-SCH

Engineer A. Lam

Date: 8/6/2025

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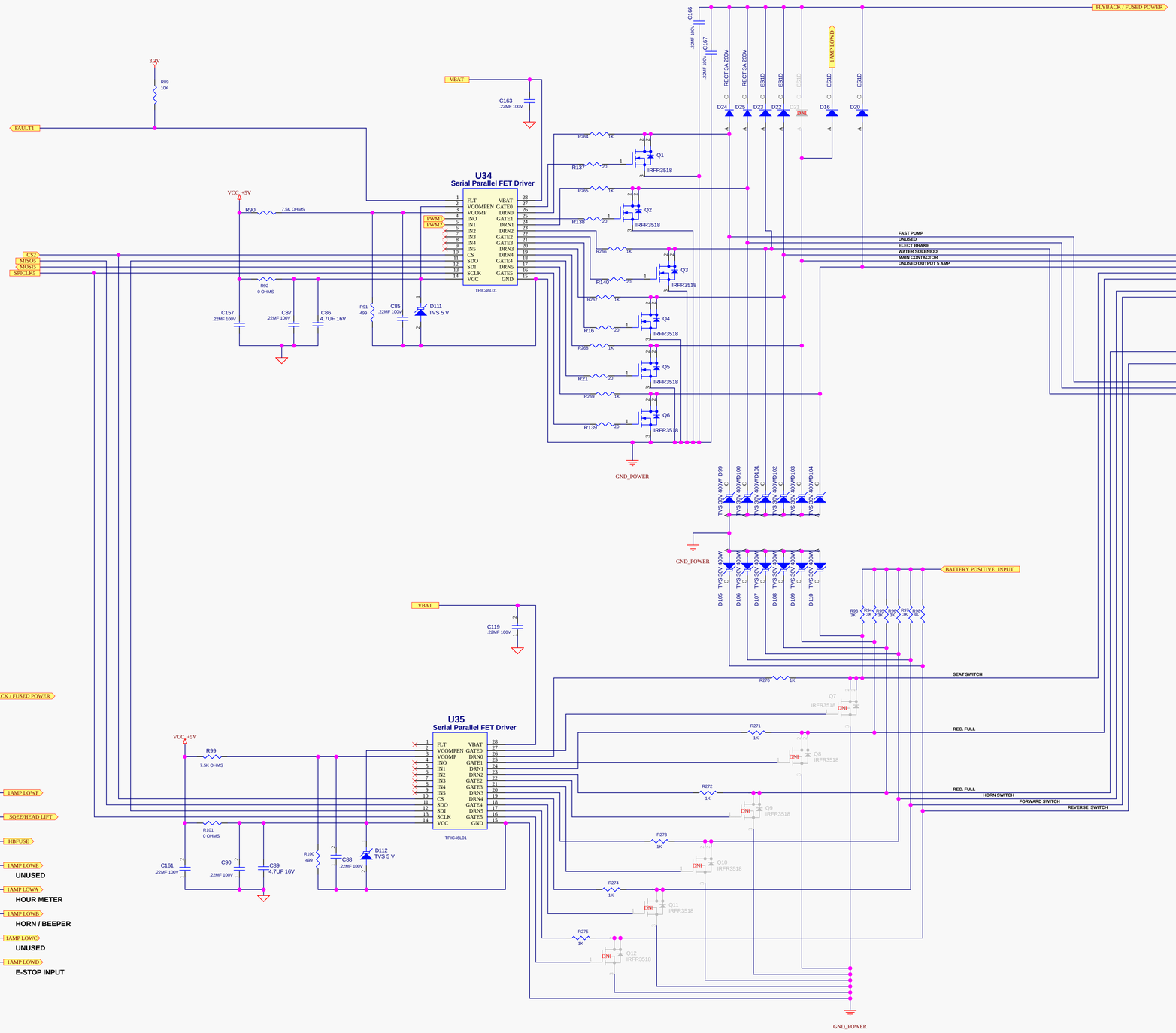


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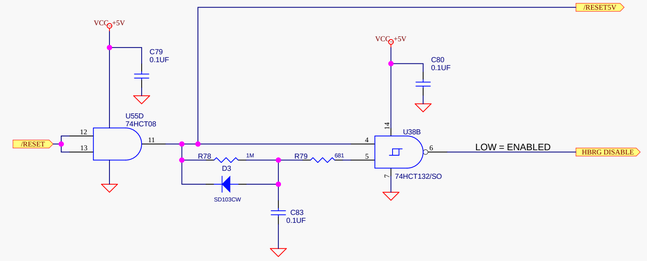
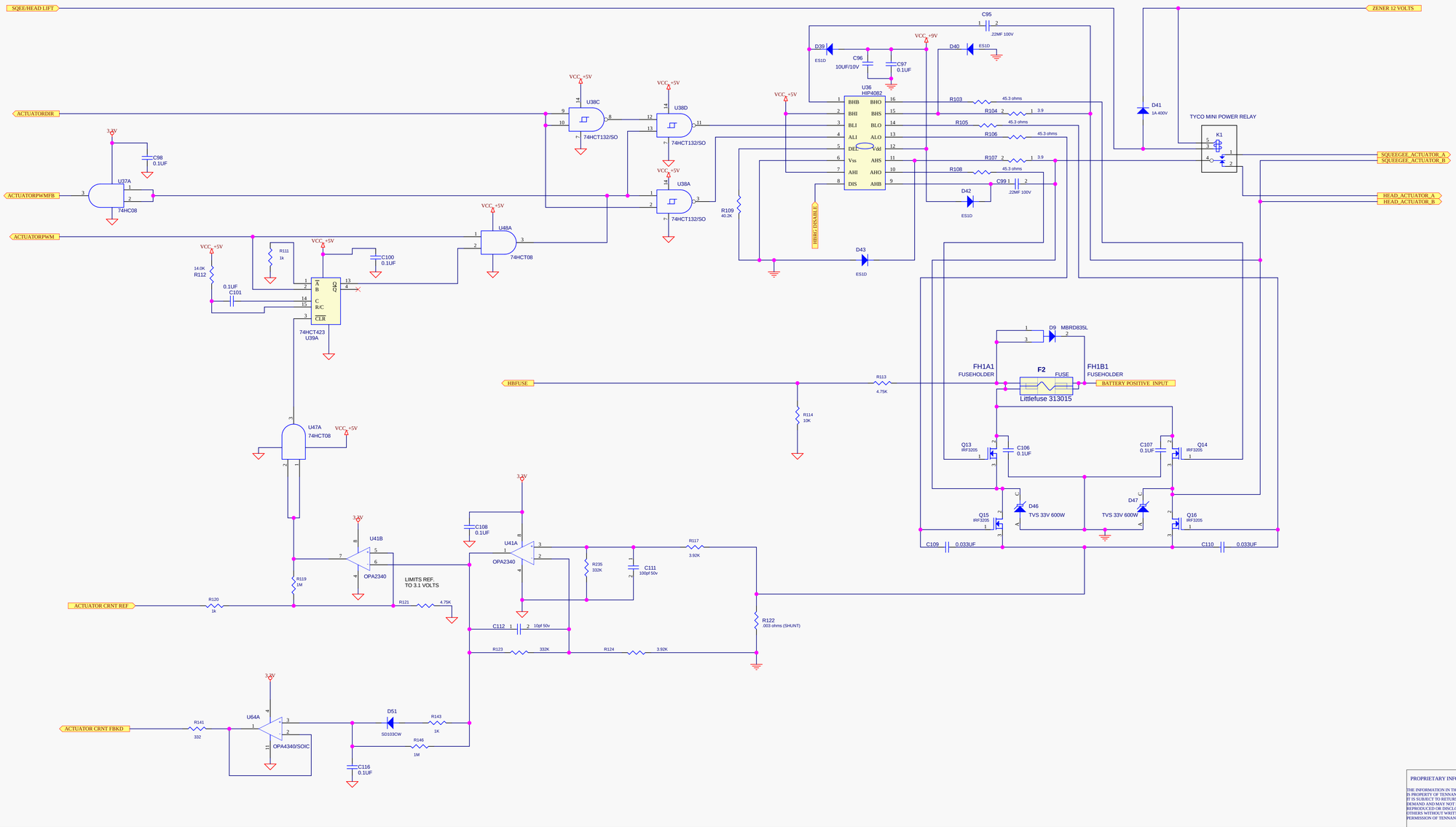
4-Drivers.SchDoc




## 5V RESET & H-BRIGE DISABLE




## ACTUATOR LIFT /LOWER SQUEEGEE / BRUSH

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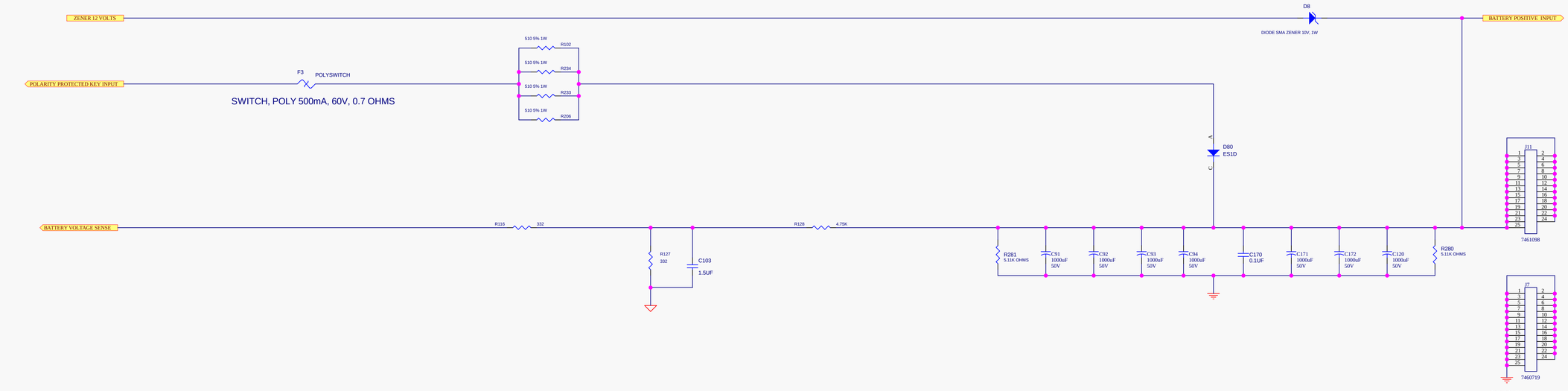
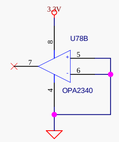
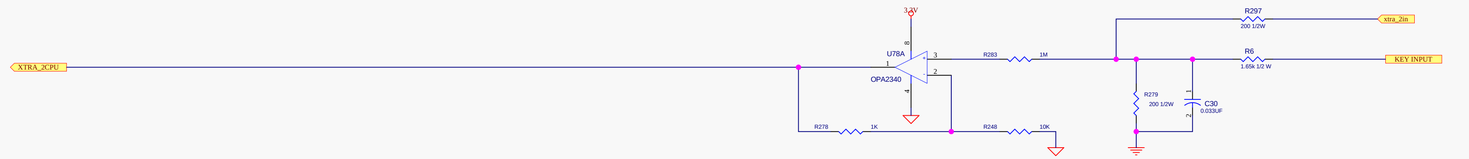
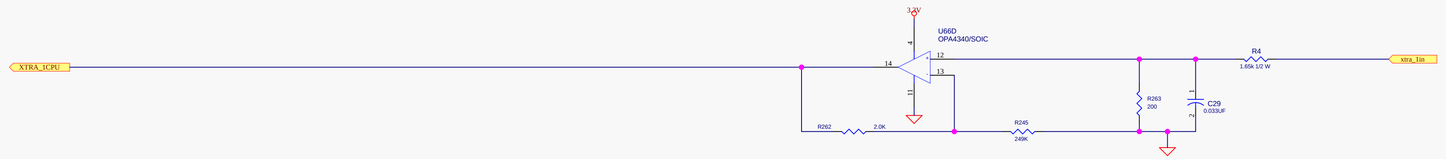
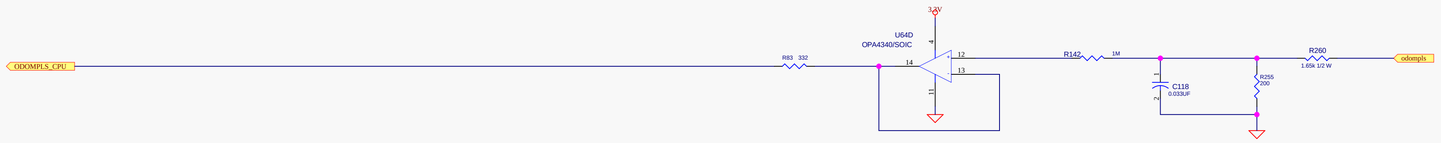
S:\H_Bridge_Actuator.SchDoc

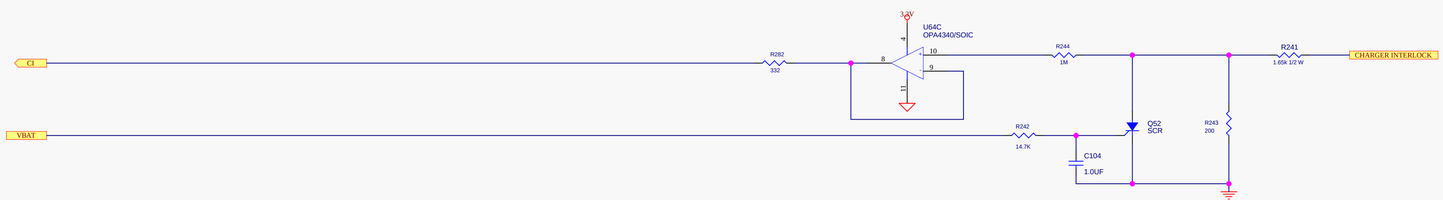
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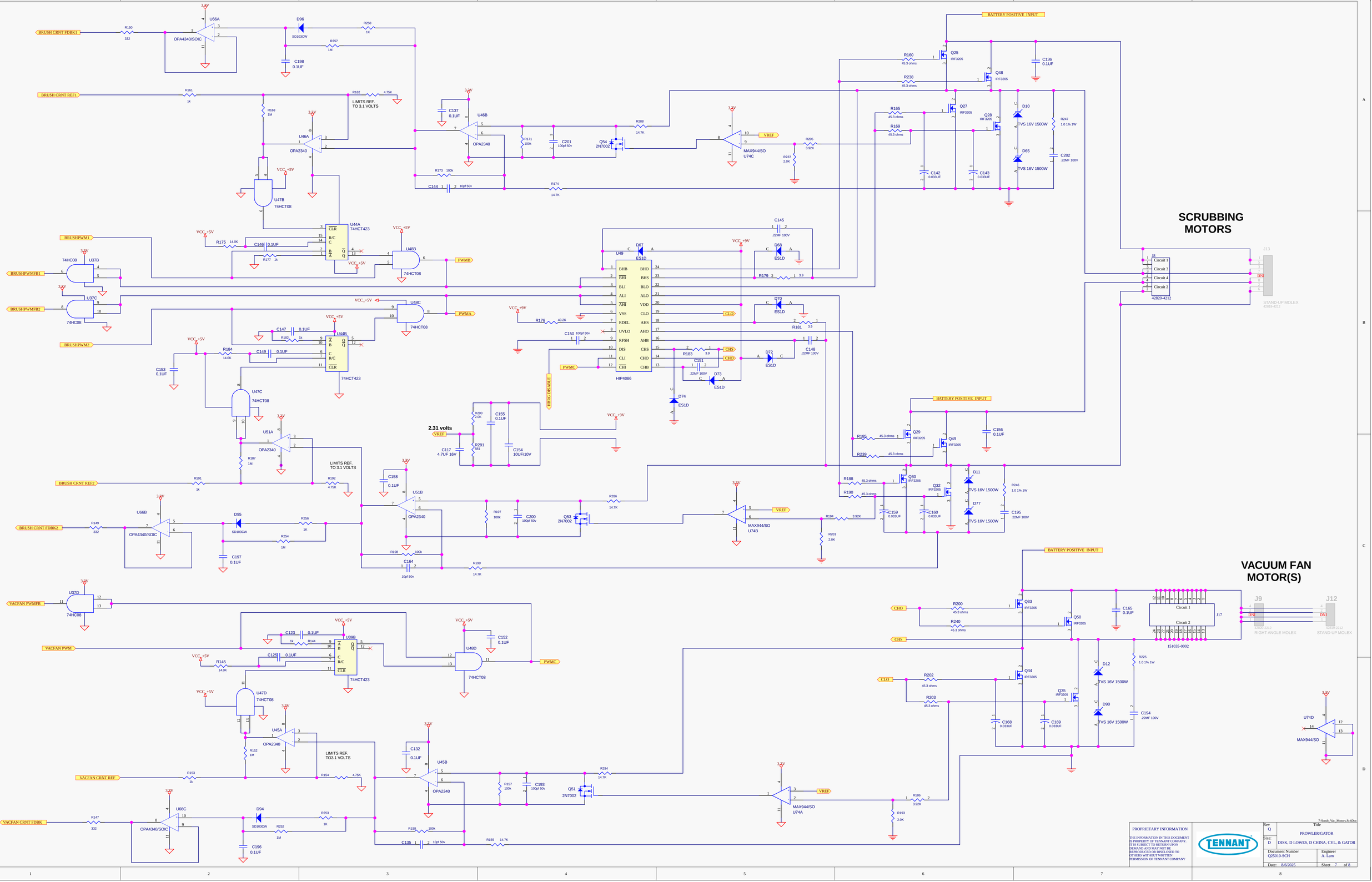


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7-Scrub_Vac_Motors.SchDoc

# PROPEL

U52D 74HCT00
DIR_A
DIR_B
VCC_+5V
C105 0.1UF
U52A 74HCT00
U52B 74HCT00
U52C 74HCT00
PROPDIR
PROPELPWMFB
PROPELPWM
U55A 74HCT08
C182 0.1UF
R218 1k
R219 14.0K
C183 0.1UF
U40B 74HCT423
U55B 74HCT08
C189 0.1UF
3.2V
U54B OPA2340
R227 1M
PROPEL CRNT REF
R228 1k
R229 4.75K
LIMITS REF. TO 3.1 VOLTS
U64B OPA4340/SOIC
PROPEL CRNT FBKD
R204 33Ω
D97 SD103CW
R259 1M
R261 1K
C199 0.1UF
C190 0.1UF
U54A OPA2340
R230 100k
C191 100pf 50v
R276 14.7K
C192 10pf 50v
R231 100k
R232 14.7K
Q47 2N7002
Q55 2N7002
DIR_A
DIR_B
U70A OPA2340
U70B OPA2340
R277 100k
R280 100k
PROPB
PROPA
C177 22MF 100V
D82 ES1D
D83 ES1D
U53 HIP4082
BHB BHO BHI BHS BLI BLO ALI ALO DEL Vdd Vss AHS AHI AHO DIS AHB
R212 3.9
R213 3.9
R214 40.2K
CHRG DISABLE
D84 ES1D
D85 ES1D
C178 .22MF 100V
C179 0.1UF
C180 10UF/10V
BATTERY POSITIVE_INPUT
R207 45.3 ohms
R208 45.3 ohms
R249 45.3 ohms DNI
Q36 IRF3205
Q37 IRF3205
Q21 IRF3205 DNI
C173 0.1UF
R209 45.3 ohms
R211 45.3 ohms
R210 45.3 ohms DNI
Q38 IRF3205
Q39 IRF3205
Q19 IRF3205 DNI
D13 TVS 16V 1500W
D81 TVS 16V 1500W
C174 .22MF 100V
R210 1.0 1% 1W
C175 0.033UF
C176 0.033UF
C203 0.033UF DNI
R215 45.3 ohms
R217 45.3 ohms
R251 45.3 ohms DNI
Q40 IRF3205
Q41 IRF3205
Q46 IRF3205 DNI
C181 0.1UF
R220 45.3 ohms
R221 45.3 ohms
R250 45.3 ohms DNI
Q42 IRF3205
Q43 IRF3205
Q20 IRF3205 DNI
D14 TVS 16V 1500W
D87 TVS 16V 1500W
C184 .22MF 100V
R222 1.0 1% 1W
C185 0.033UF
C186 0.033UF
C204 0.033UF DNI
J14
J10
42820-2212 Prowler ONLY
Circuit 1 DNI
Circuit 2
J18
TS1EE-0002 Gator ONLY
42820-2212 TS ONLY
R126 1k
C113 0.1UF
U40A 74HCT423
U55C 74HCT08

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