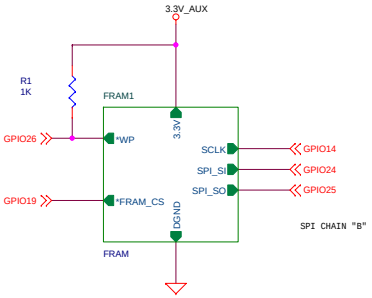
QUANTUM CONTROL BOARD

Rev -005
Ready to release, only changes from -004: Removing test points, tie off unused gates, and improving clearances around heatsink mounting holes, Change DB9 to 4 pin header. Relay became 24v, zeners became 6v. Removing test points.

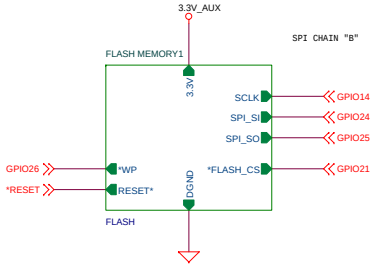
Tennant Company
701 North Lilac Drive
Minneapolis, Minnesota 55440
United States of America

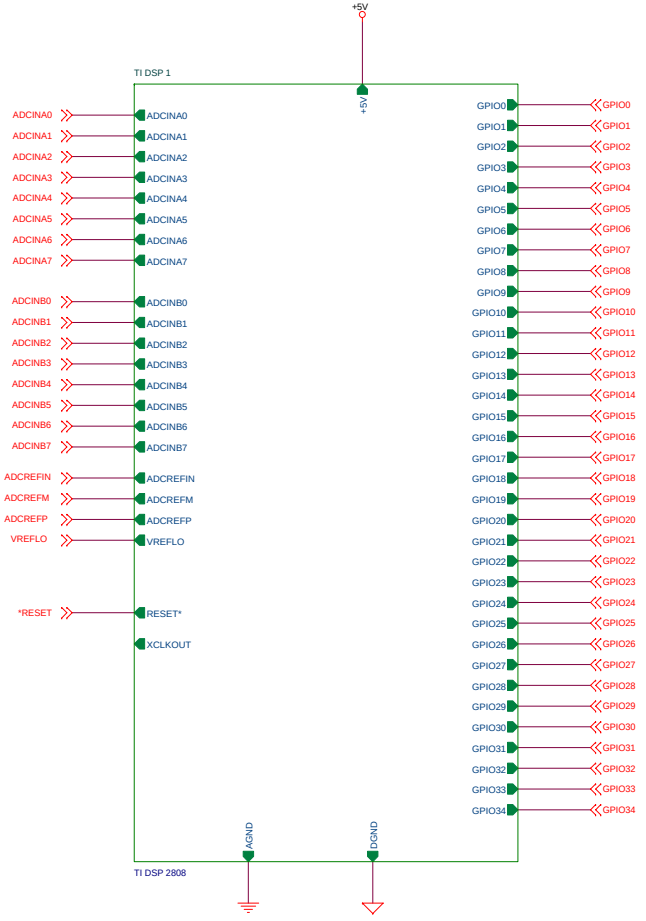
DSP

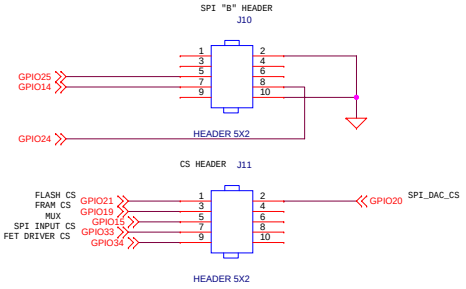
FRAM



FLASH







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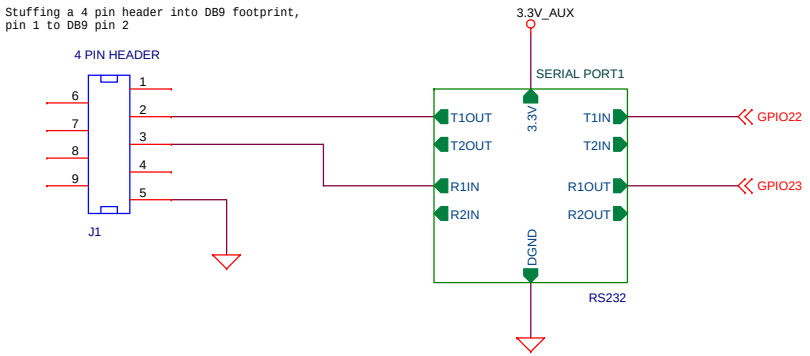
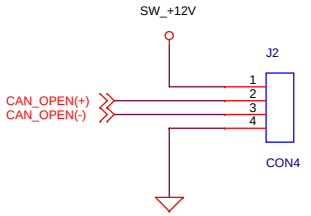
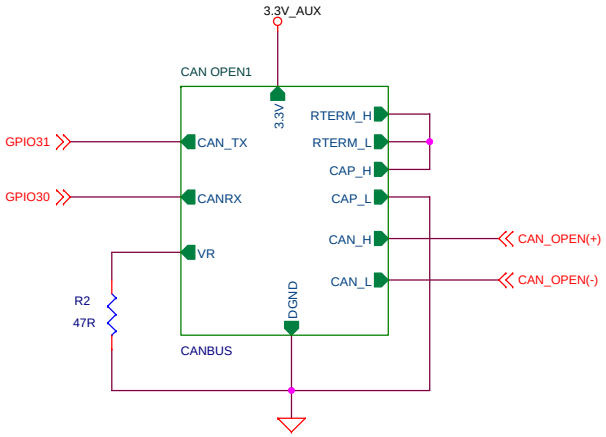
COMM PORTS

RS-232 DIAGNOSTICS

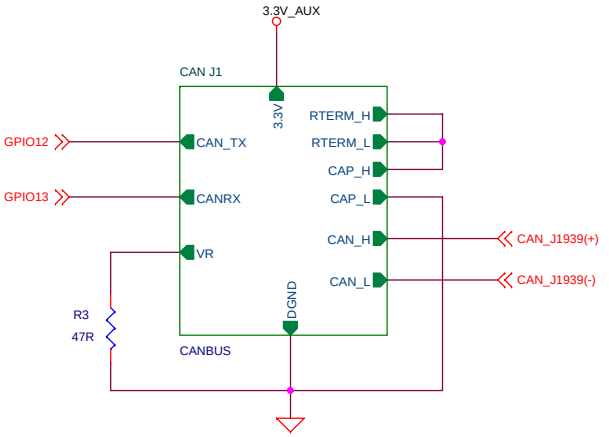




CAN Open



J1939



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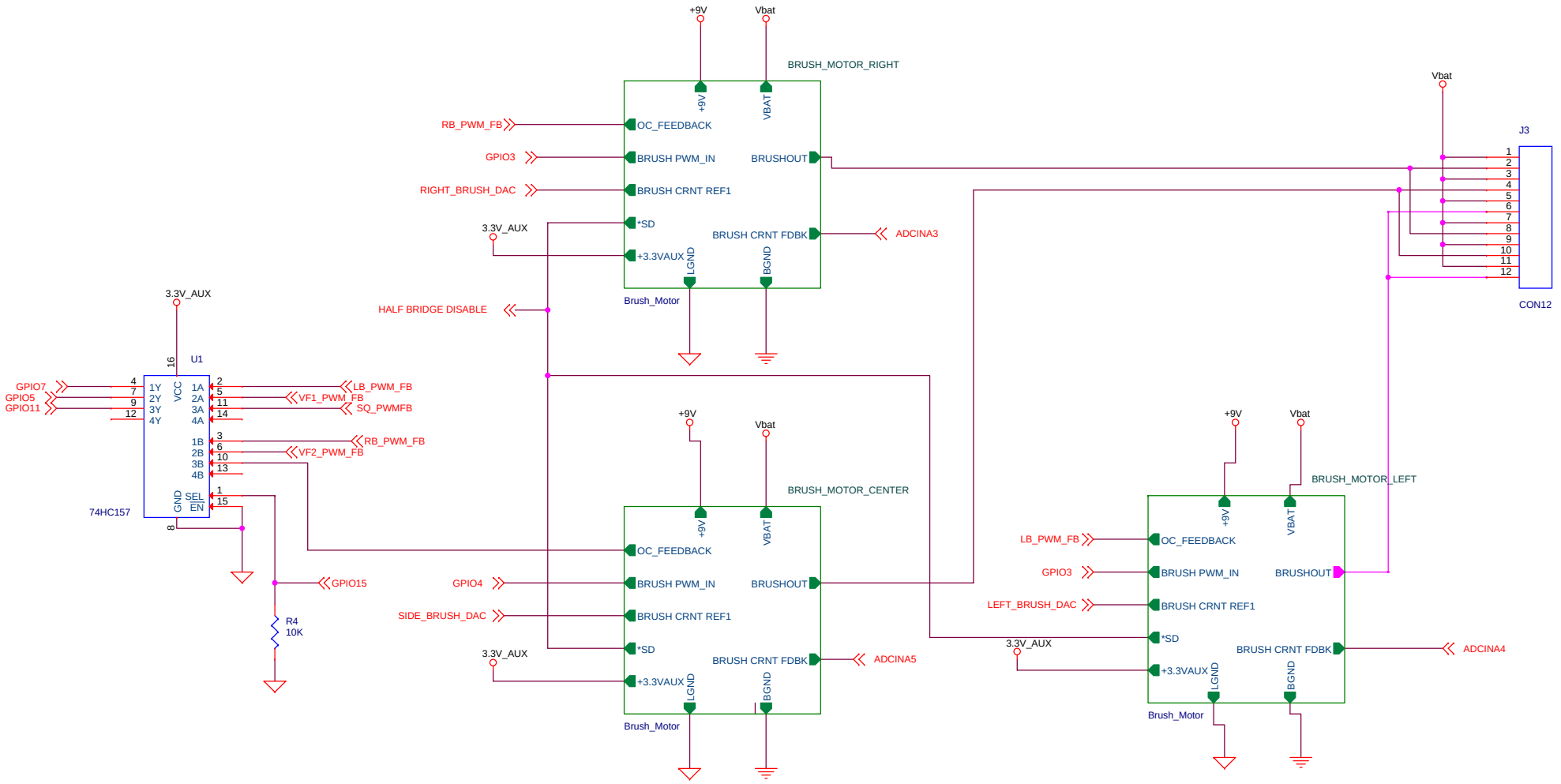
BRUSH MOTORS



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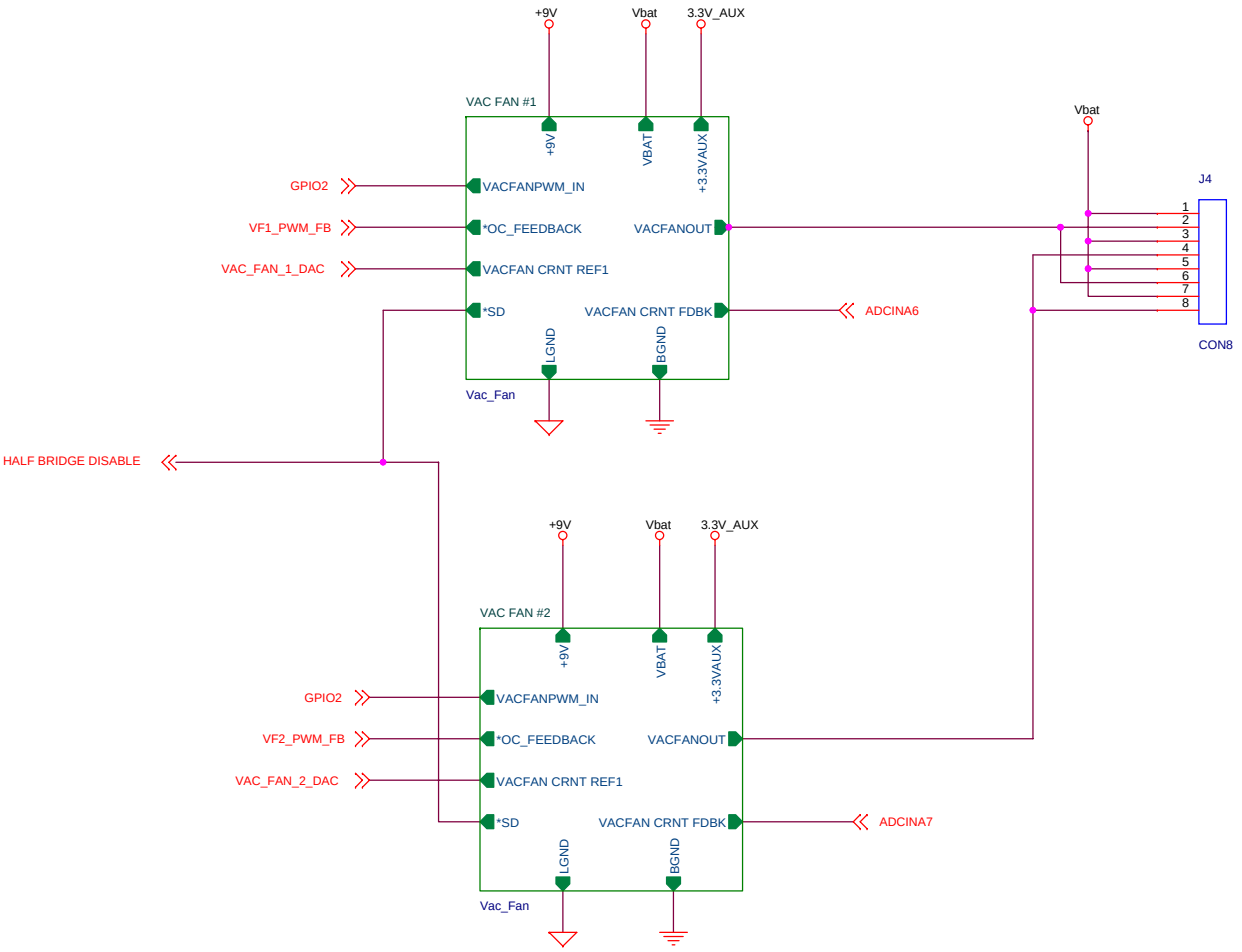
VACUUM FANS



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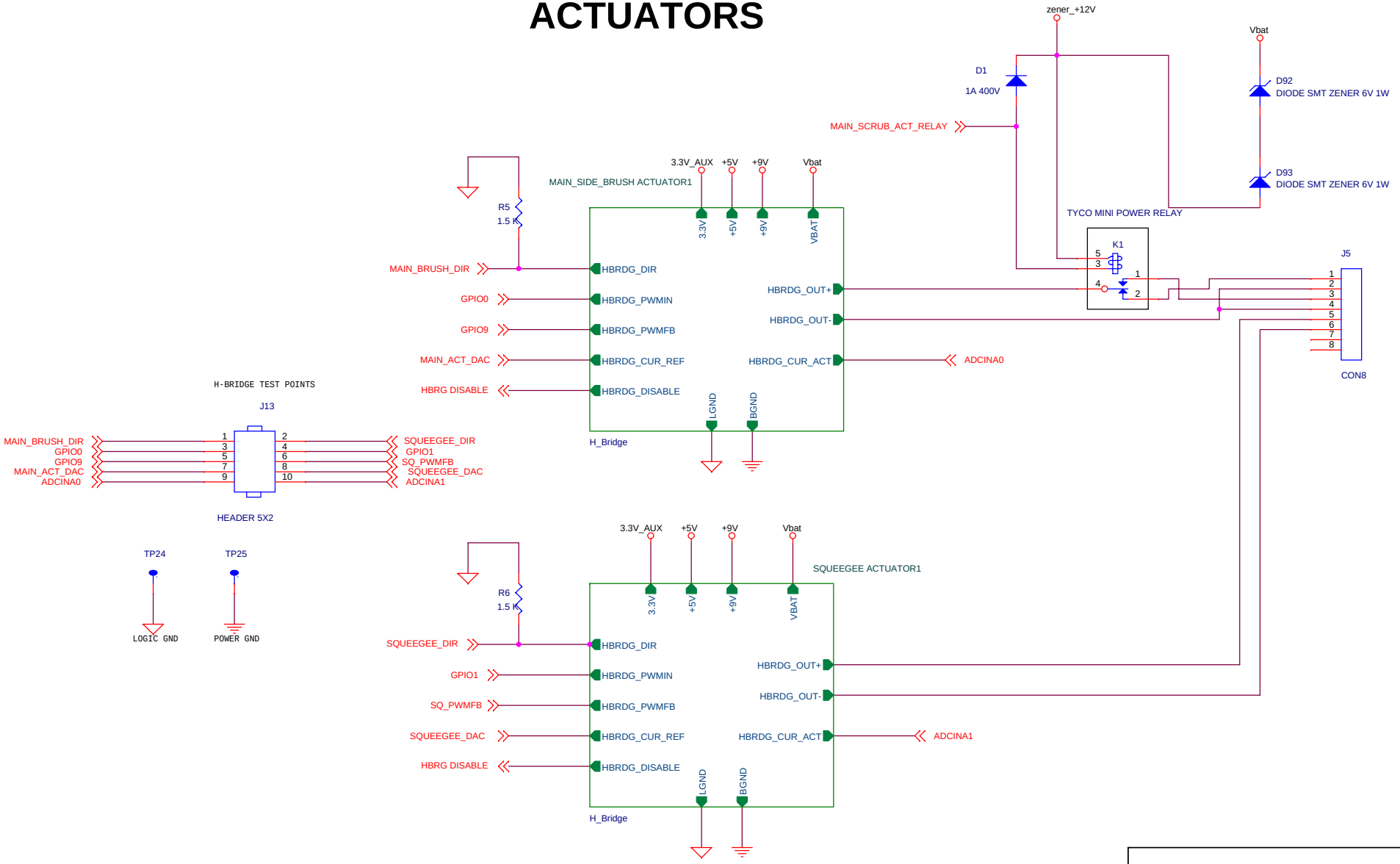
ACTUATORS



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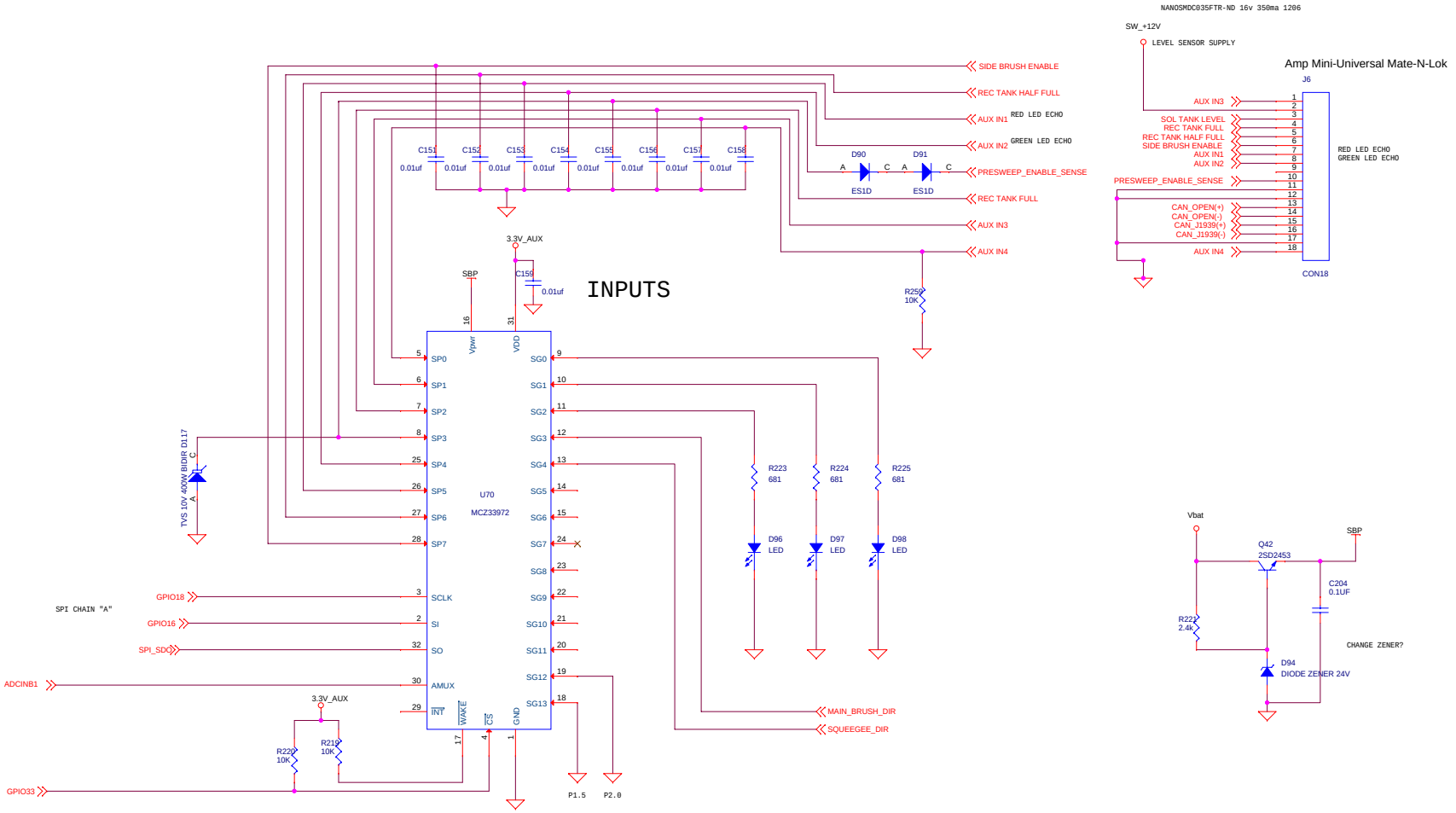
SPI INPUTS



NANOSMDC035FTR-ND 16v 350ma 1206

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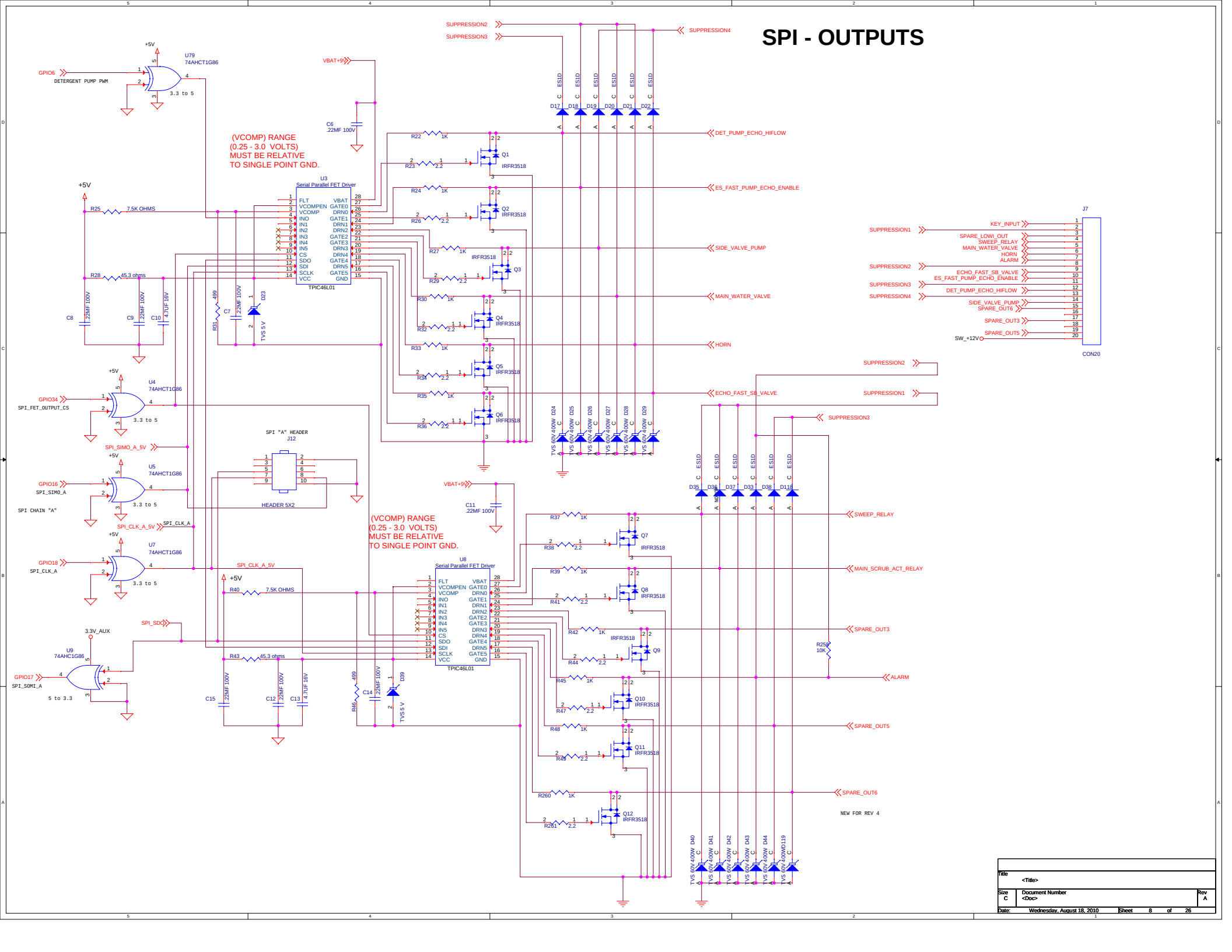
SPI - OUTPUTS


SUPPRESSION2
SUPPRESSION3
SUPPRESSION4
DET_PUMP_ECHO_HIFLOW
ES_FAST_PUMP_ECHO_ENABLE
SIDE_VALVE_PUMP
MAIN_WATER_VALVE
HORN
ECHO_FAST_SB_VALVE
SUPPRESSION1
SWEEP_RELAY
MAIN_SCRUB_ACT_RELAY
SPARE_OUT3
ALARM
SPARE_OUT5
SPARE_OUT6
NEW FOR REV 4
(VCOMP) RANGE
(0.25 - 3.0 VOLTS)
MUST BE RELATIVE
TO SINGLE POINT GND.
U3
Serial Parallel FET Driver
TPIC46L01
U8
Serial Parallel FET Driver
TPIC46L01
J7
CON20
KEY_INPUT
SPARE_LOW1_OUT
SWEEP_RELAY
MAIN_WATER_VALVE
HORN
ALARM
ECHO_FAST_SB_VALVE
ES_FAST_PUMP_ECHO_ENABLE
DET_PUMP_ECHO_HIFLOW
SIDE_VALVE_PUMP
SPARE_OUT6
SPARE_OUT3
SPARE_OUT5
SW_+12V
SPI "A" HEADER
J12
HEADER 5X2
SPI CHAIN "A"
GPIO6
DETERGENT PUMP PWM
GPIO34
SPI_FET_OUTPUT_CS
GPIO16
SPI_SIMO_A
GPIO18
SPI_CLK_A
GPIO17
SPI_SOMI_A
SPI_SDO
SPI_SIMO_A_5V
SPI_CLK_A_5V
SPI_CLK_A
3.3V_AUX
+5V
VBAT+9
3.3 to 5
5 to 3.3
U79
74AHCT1G86
U4
74AHCT1G86
U5
74AHCT1G86
U7
74AHCT1G86
U9
74AHC1G86
R25 7.5K OHMS
R28 45.3 ohms
R40 7.5K OHMS
R43 45.3 ohms
R260 10K
C6 .22MF 100V
C11 .22MF 100V
C8 .22MF 100V
C9 .22MF 100V
C10 4.7UF 16V
C7 .22MF 100V
C15 .22MF 100V
C12 .22MF 100V
C13 4.7UF 16V
C14 .22MF 100V
R31 499
R46 499
D23 TVS 5 V
D39 TVS 5 V
Q1 IRFR3518
Q2 IRFR3518
Q3 IRFR3518
Q4 IRFR3518
Q5 IRFR3518
Q6 IRFR3518
Q7 IRFR3518
Q8 IRFR3518
Q9 IRFR3518
Q10 IRFR3518
Q11 IRFR3518
Q12 IRFR3518
D17 D18 D19 D20 D21 D22 ES1D
D24 D25 D26 D27 D28 D29 TVS 60V 400W
D35 D36 D37 D33 D38 D118 ES1D
D40 D41 D42 D43 D44 D119 TVS 60V 400W
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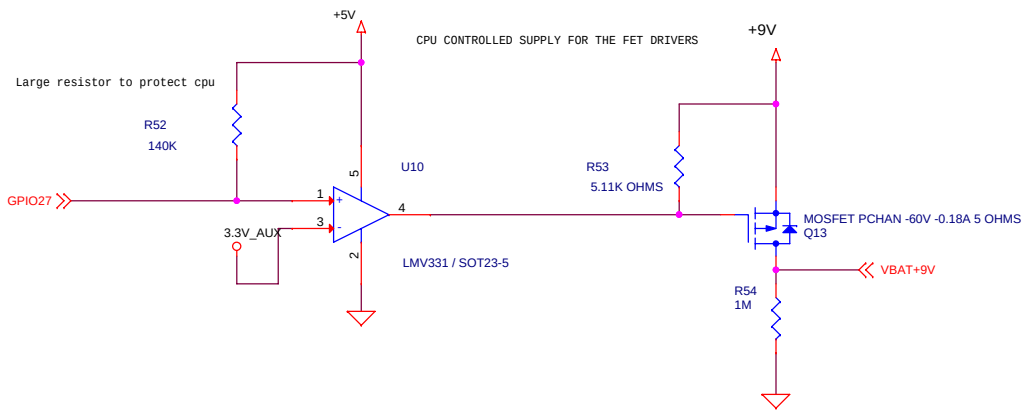
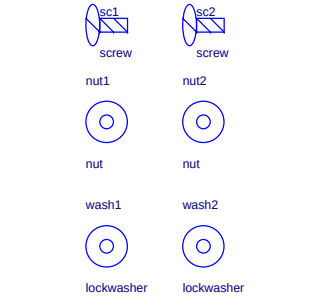
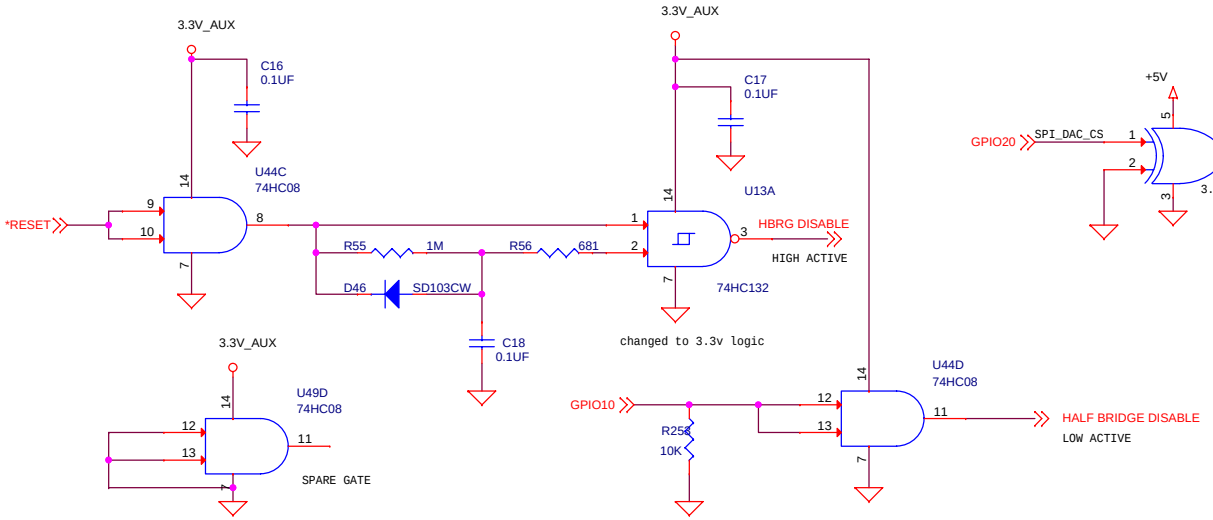




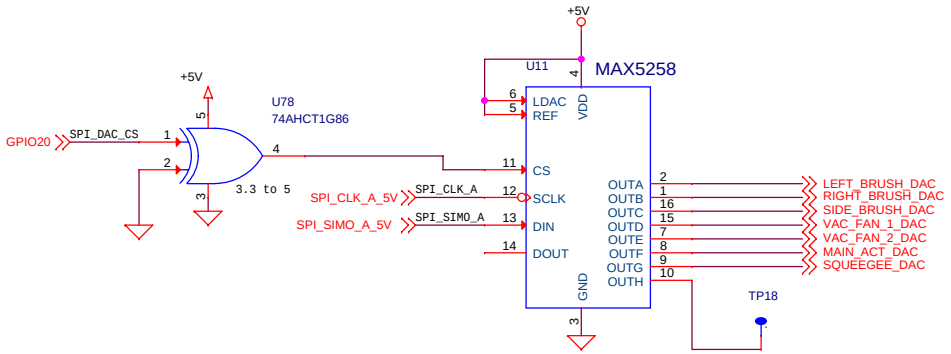
Mounting hardware for the actuator connector

H-BRIDGE DISABLE



DIGITAL - ANALOG CONVERTER

CHANGED TO SPI "A"



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Power Supply

Battery Input

Vbat

J8

1

CON1

J9

1

CON1

Vbat

C205 1000UF C206 1000UF C207 1000UF C208 1000UF C209 1000UF

BRIDGE CAPS

+5V

C220 0.1UF C221 0.1UF C222 0.1UF C223 0.1UF C165 0.1UF C166 0.1UF

3.3V_AUX

C172 0.1UF C173 0.1UF C174 0.1UF C175 0.1UF C176 0.1UF C177 0.1UF C178 0.1UF C179 0.1UF

C180 0.1UF C181 0.1UF C182 0.1UF C183 0.1UF C184 0.1UF C185 0.1UF C186 0.1UF C187 0.1UF

3.3V_AUX

C188 0.1UF

C193 0.1UF C194 0.1UF C195 0.1UF

C196 0.1UF C197 0.1UF C198 0.1UF C199 0.1UF C200 0.1UF C201 0.1UF C202 0.1UF C203 0.1UF

+9V

C160 0.1UF C161 0.1UF C162 0.1UF C163 0.1UF C164 0.1UF

+5V

+9V

adjustable

SW_+12V

POWERSUPPLY

KEY_INPUT

VBAT

BGND

+5V

+9V

DGND

Switched +12V

+12V Enable

RT1

PolySwitch

GPIO29

\MODULAR - POWERSUPPLY

POWER SUPPLY +3.3V

3.3V LOW DROPOUT LINEAR REGULATOR

3.3V_AUX

TPS7133Q/SOIC

U14

IN 3 4 IN

OUT 5 6 OUT

FB 7

PG 8

EN 2

GND 1

C19 0.1UF

R58 4.75K

C20 33uf

R230 681

D100 LED

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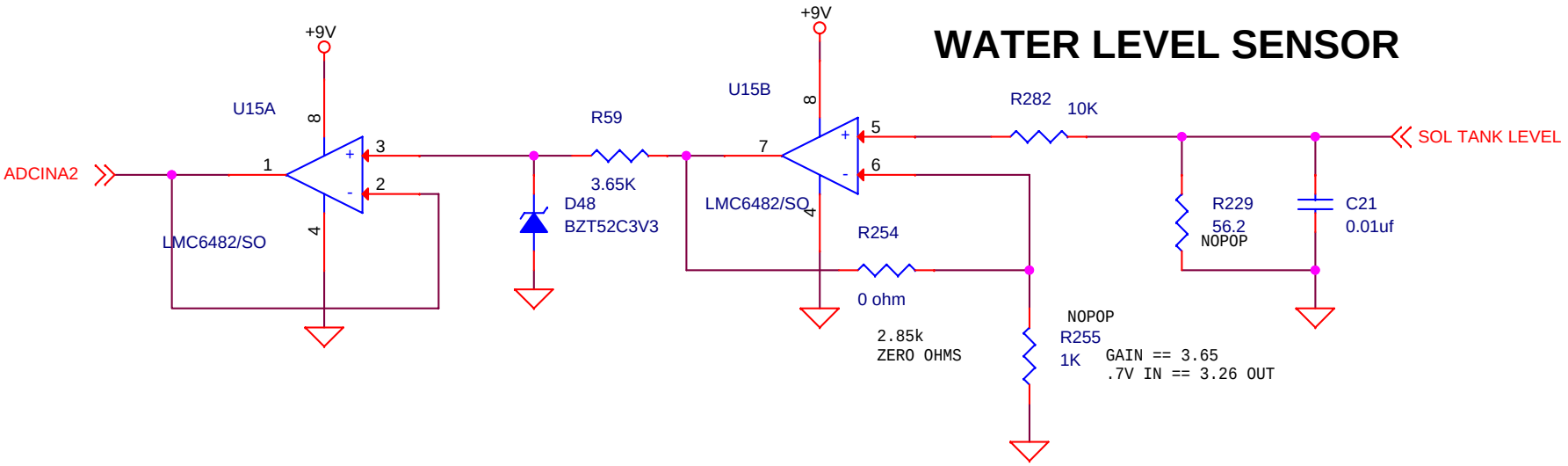
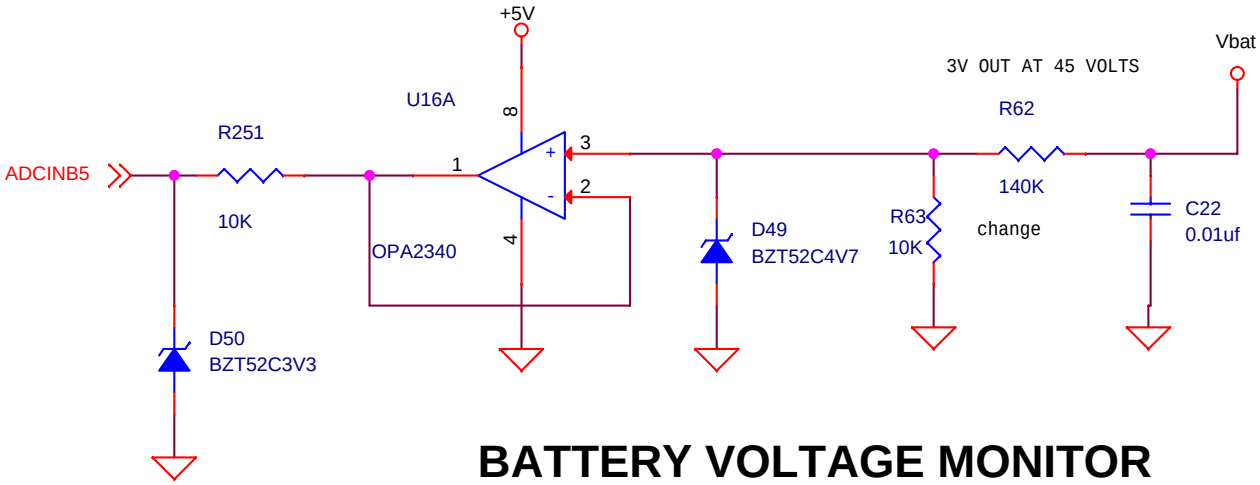
WATER LEVEL SENSOR



changed this to a unity gain amp for pressure tube sensor



BATTERY VOLTAGE MONITOR

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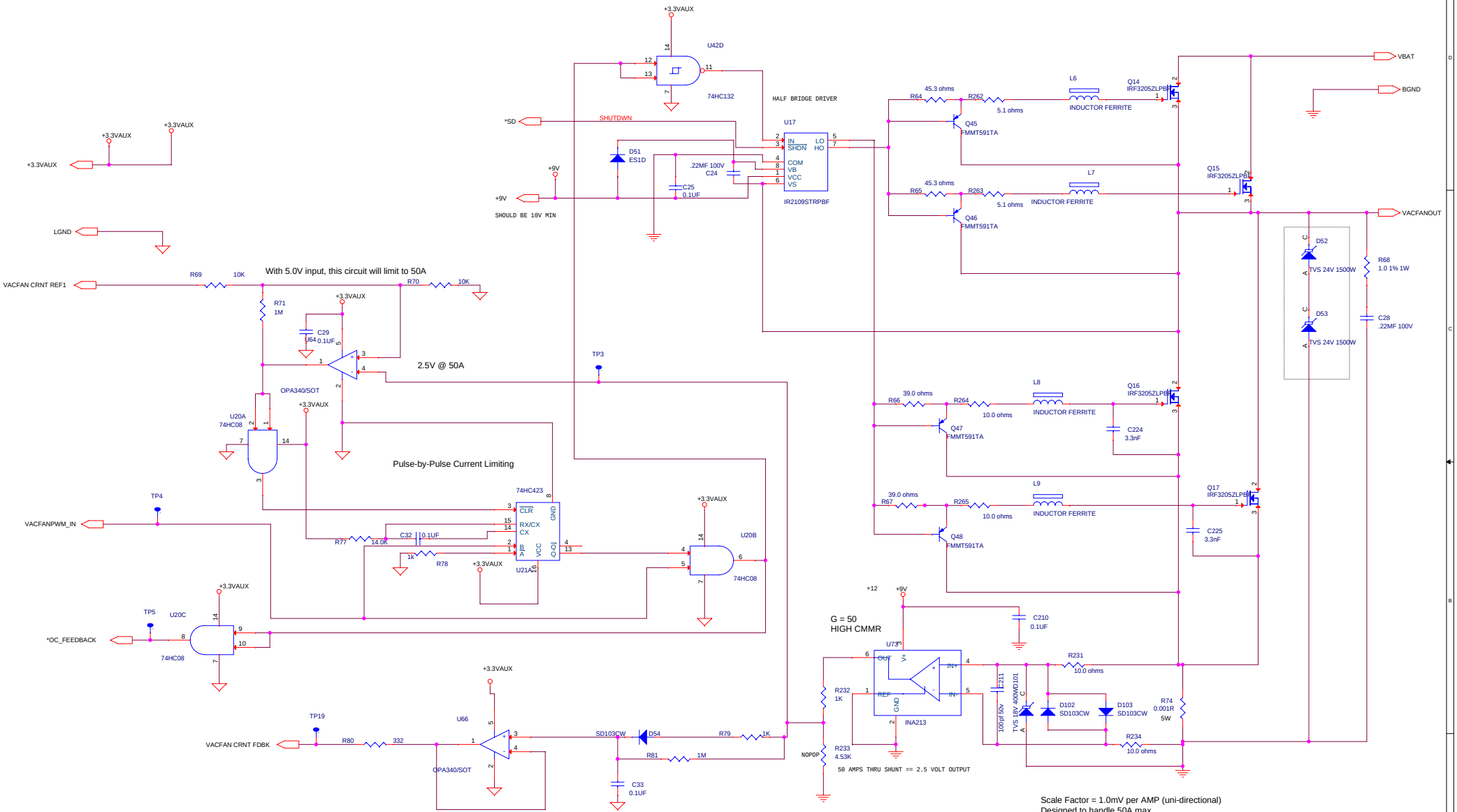
Vacuum Fan Control



Title	Modular - Vacuum Fan	
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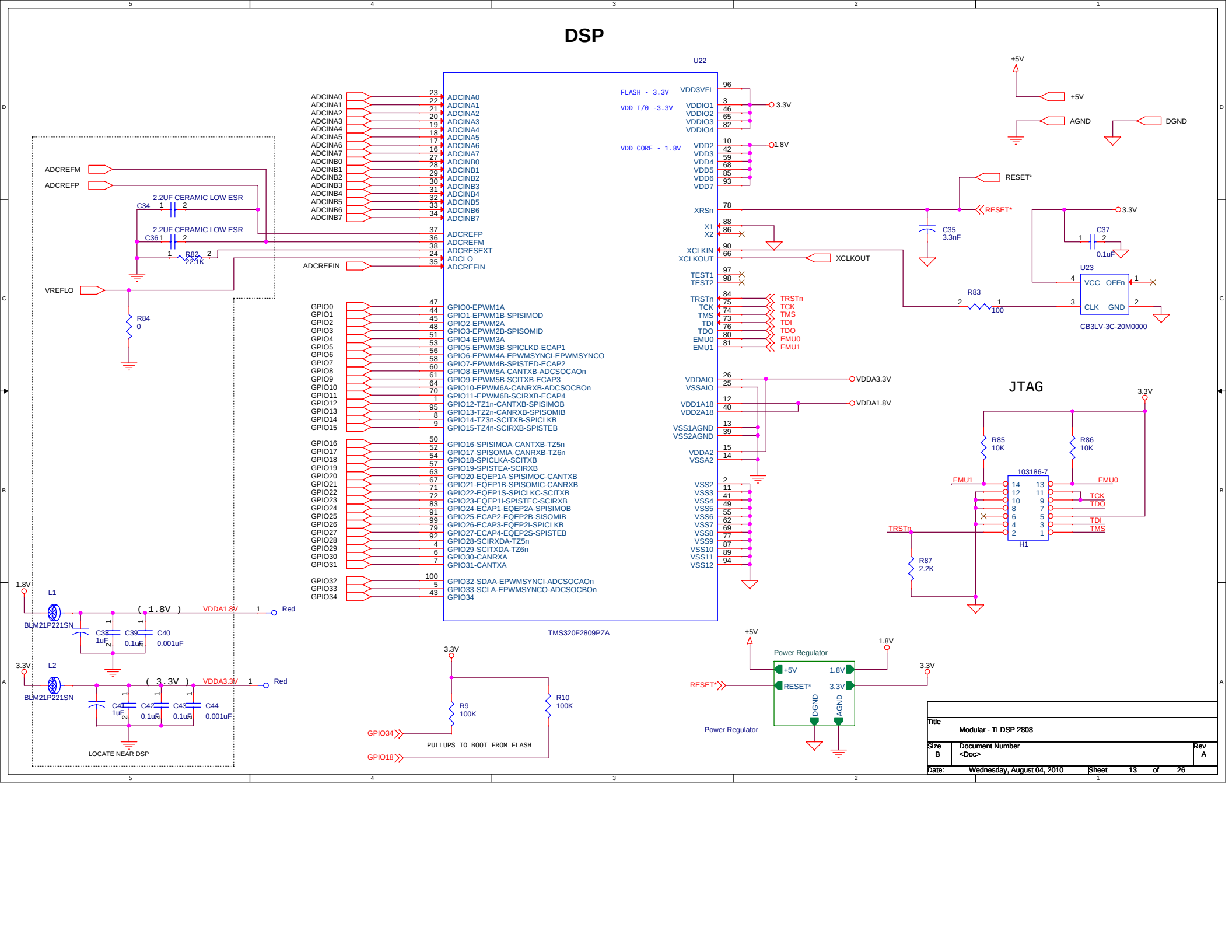
DSP



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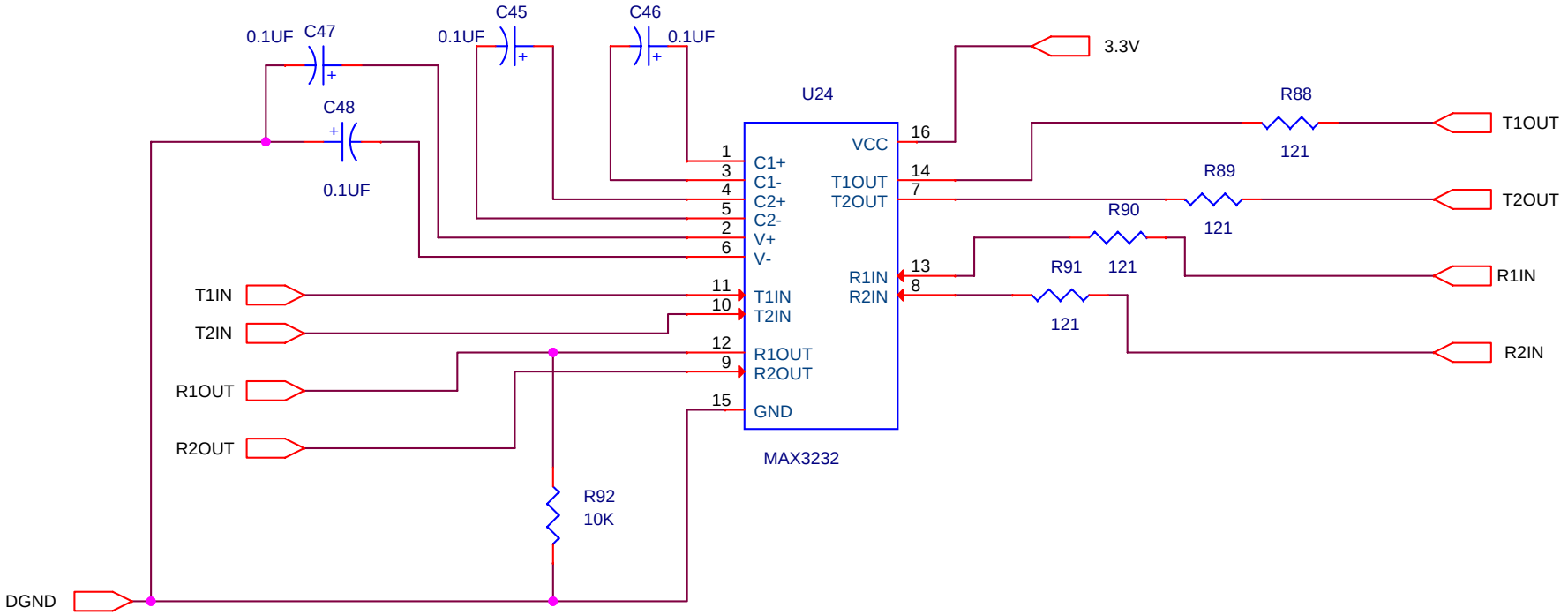
RS-232 SERIAL PORT



Title	Modular - RS232	
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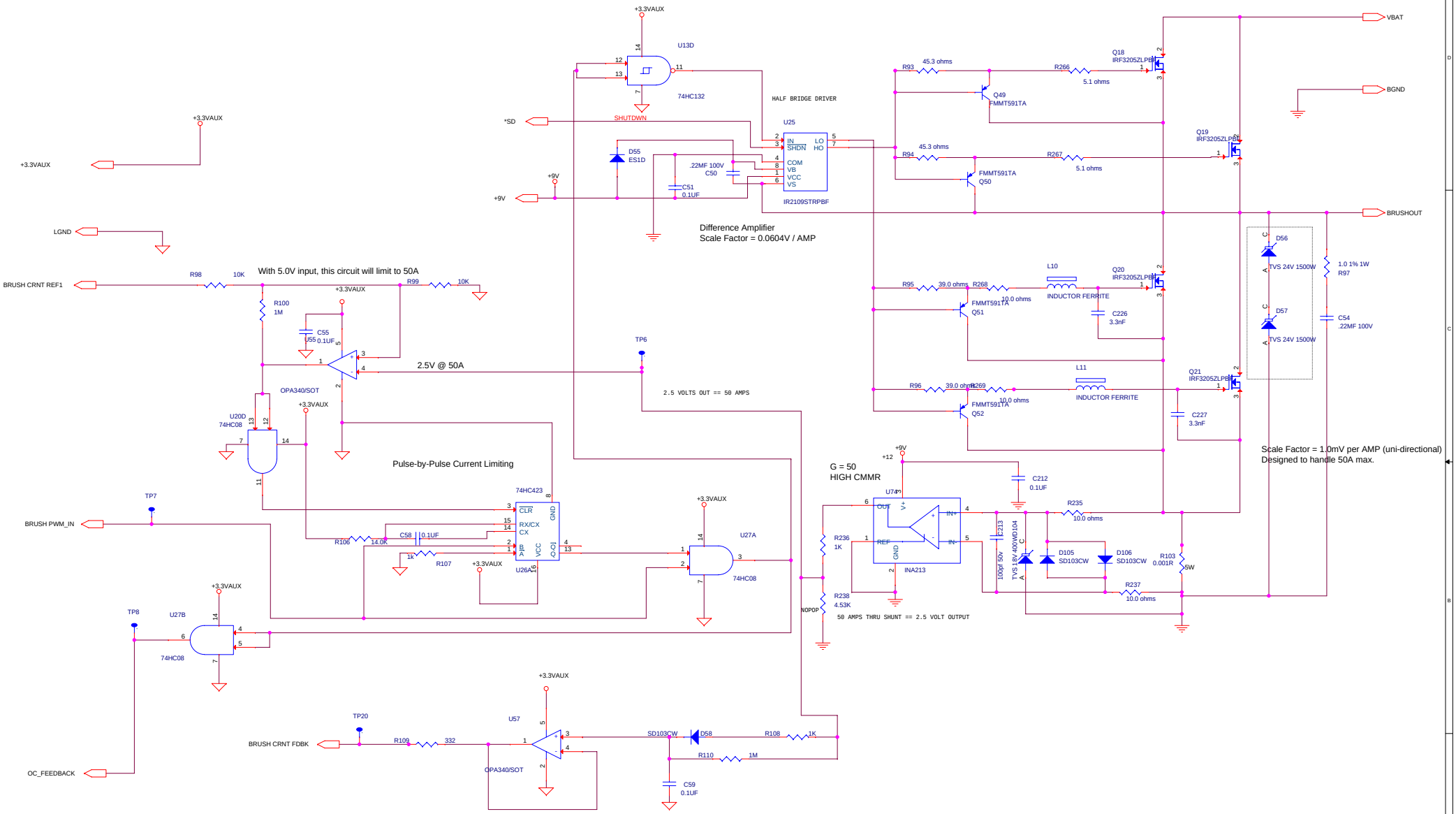
Brush Motor Control



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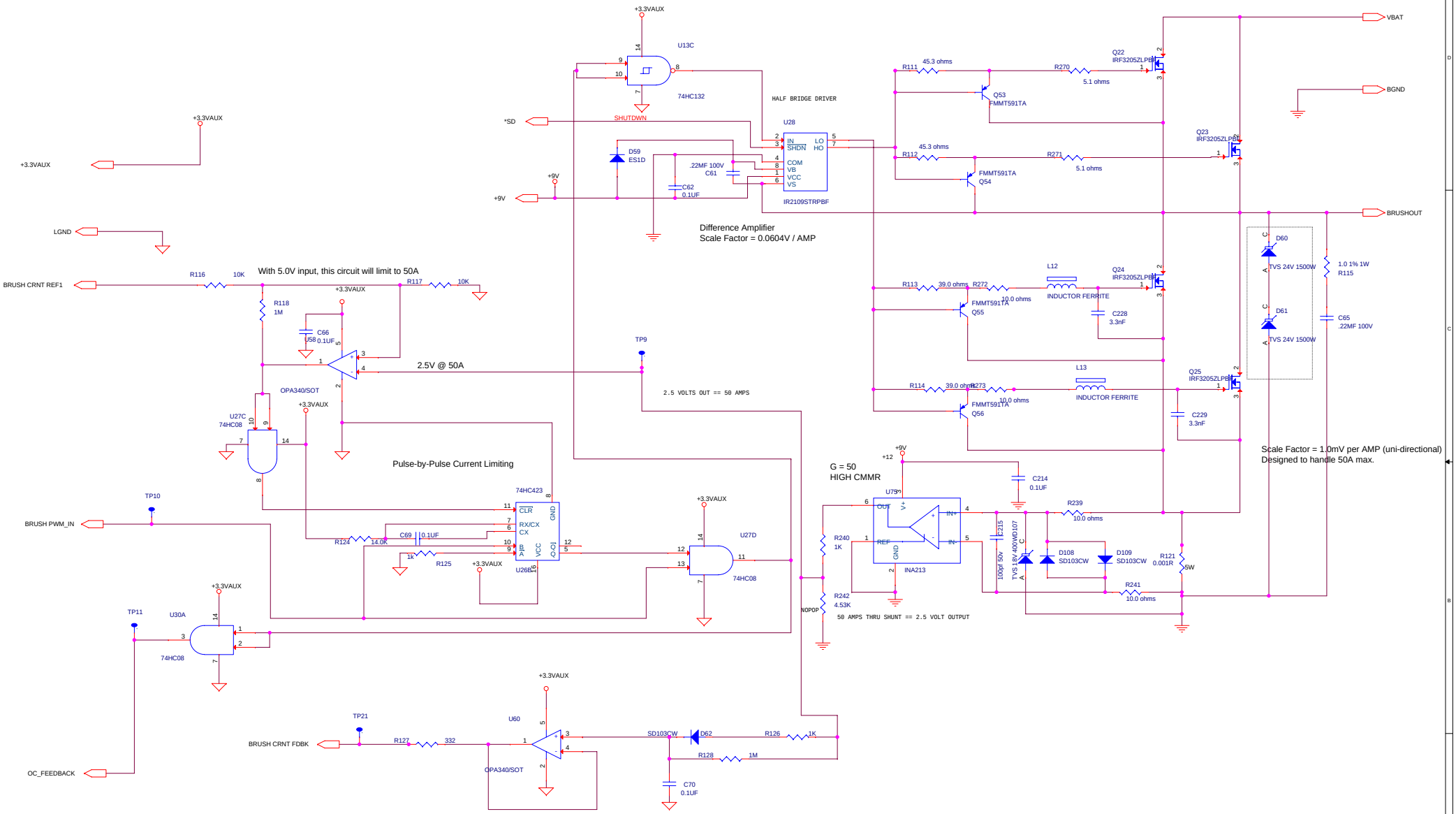
Brush Motor Control



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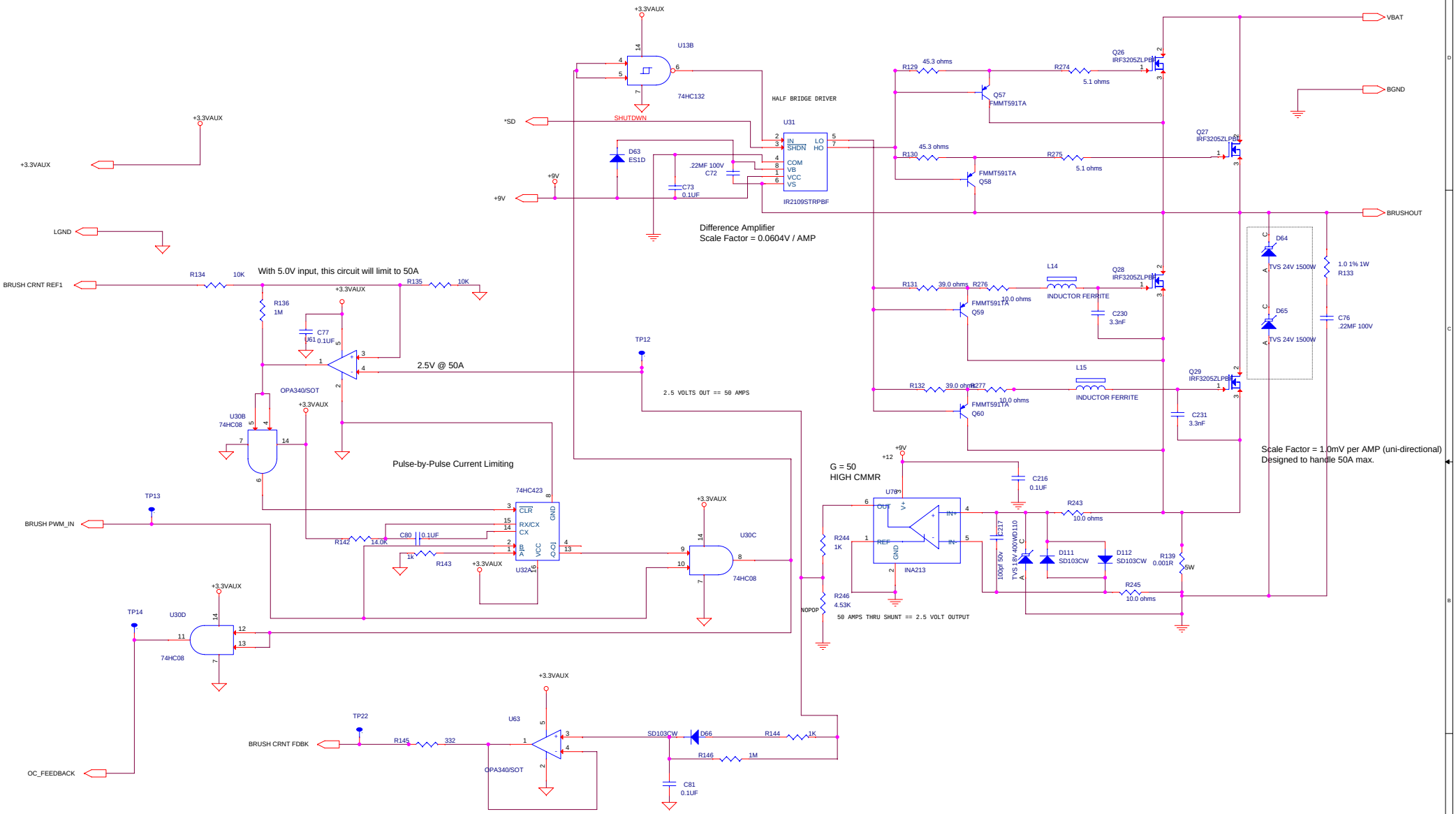
Brush Motor Control



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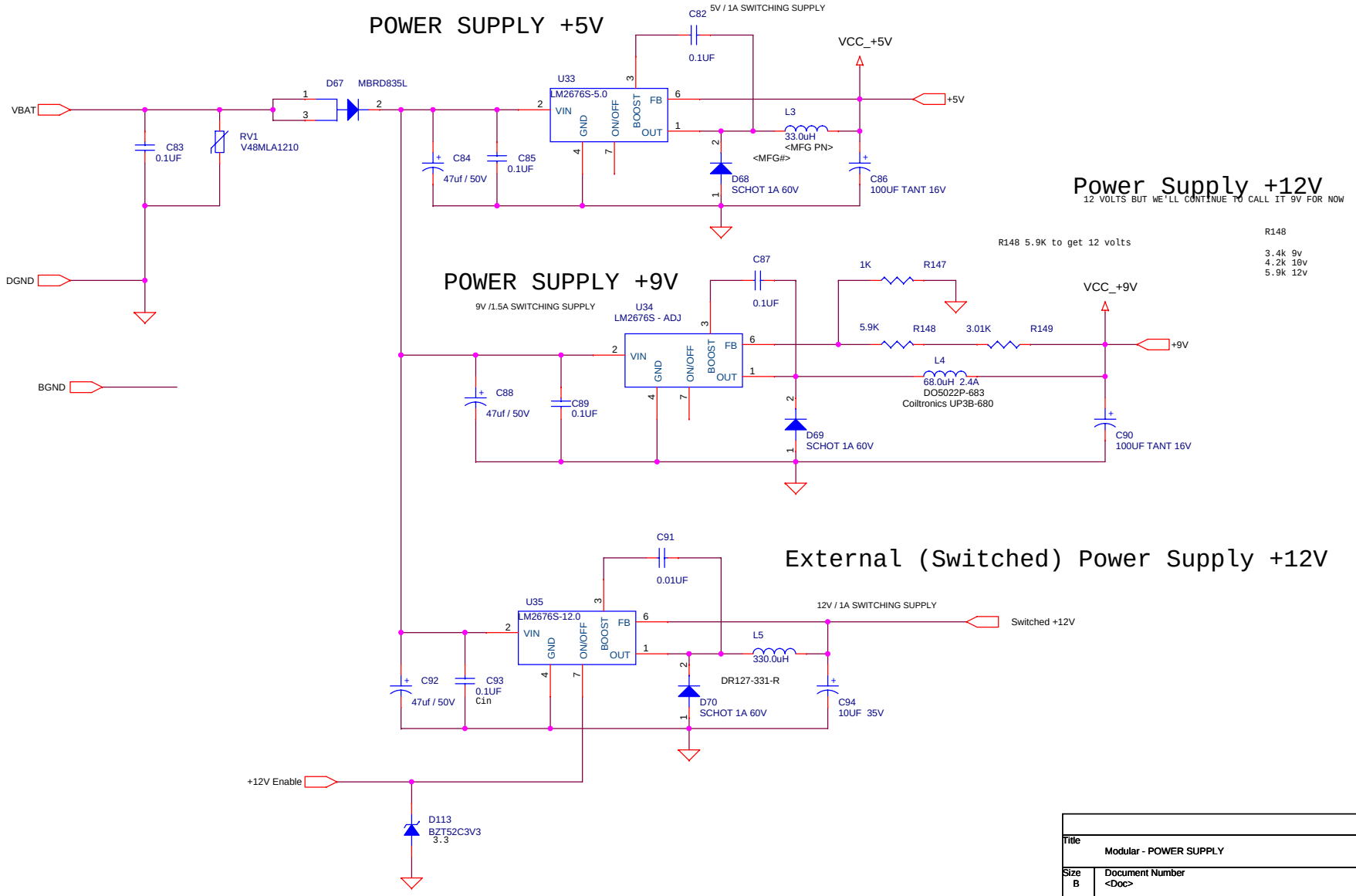
Power Supply



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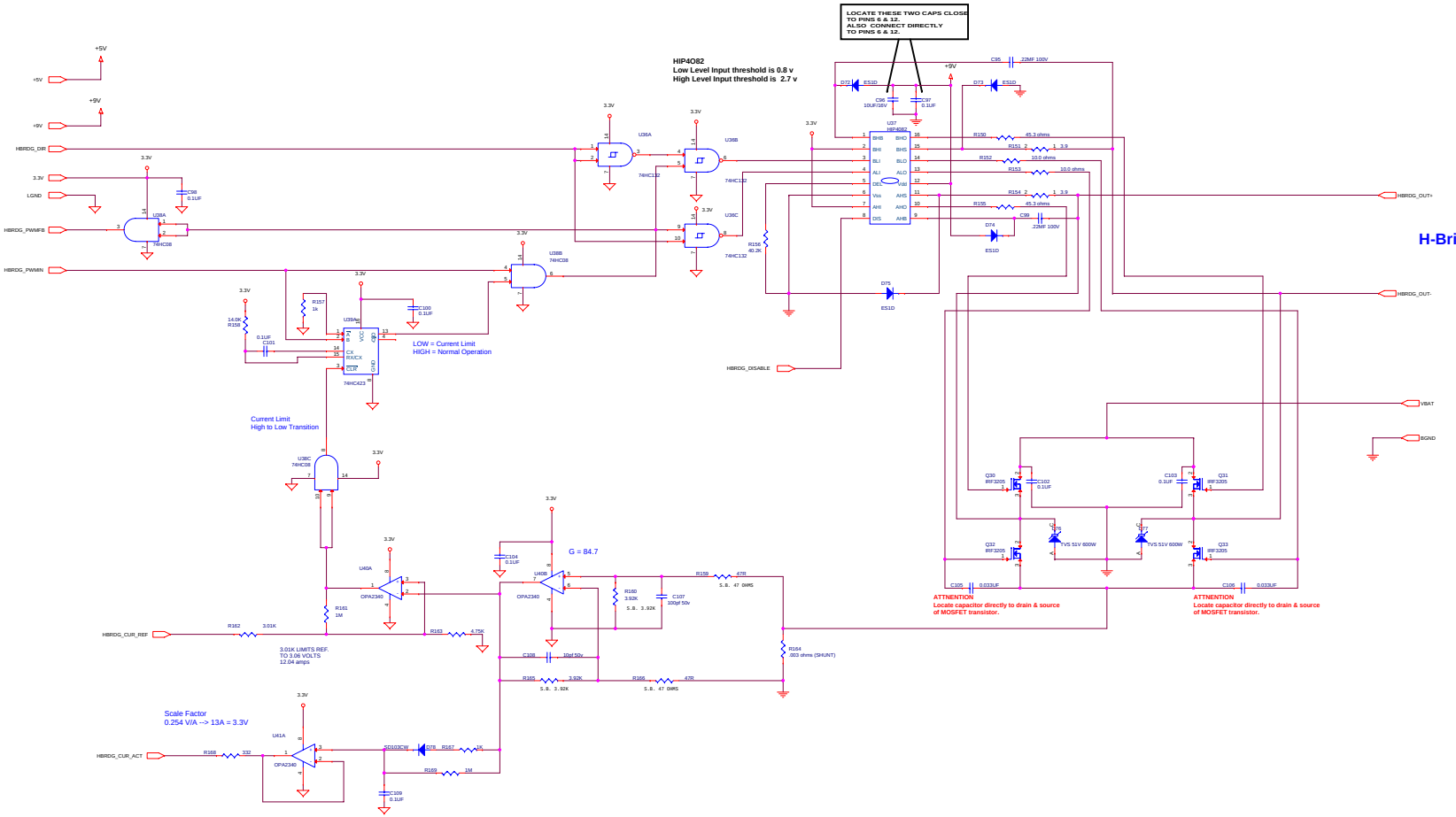
H-Bridge Control



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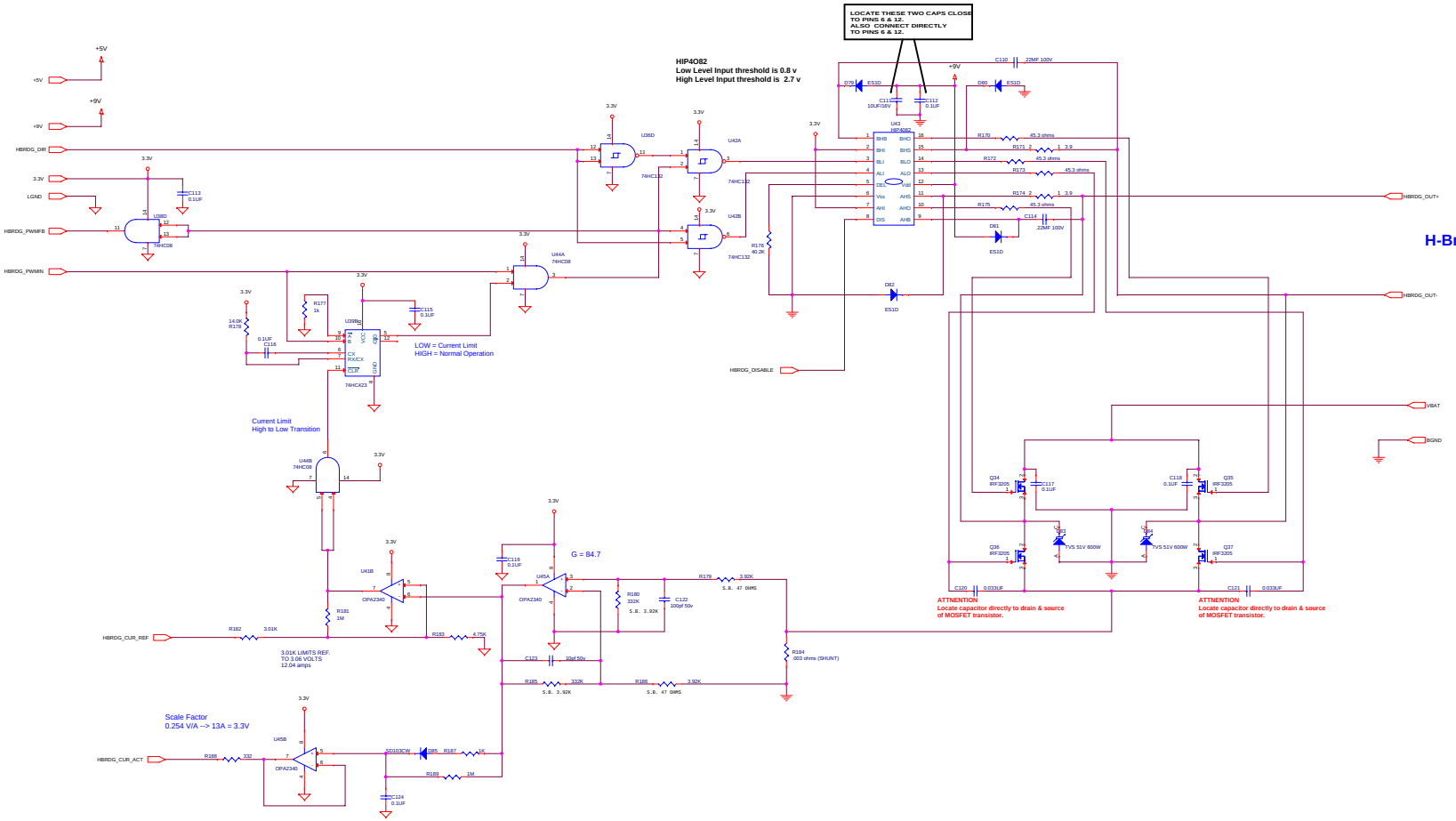
H-Bridge Control



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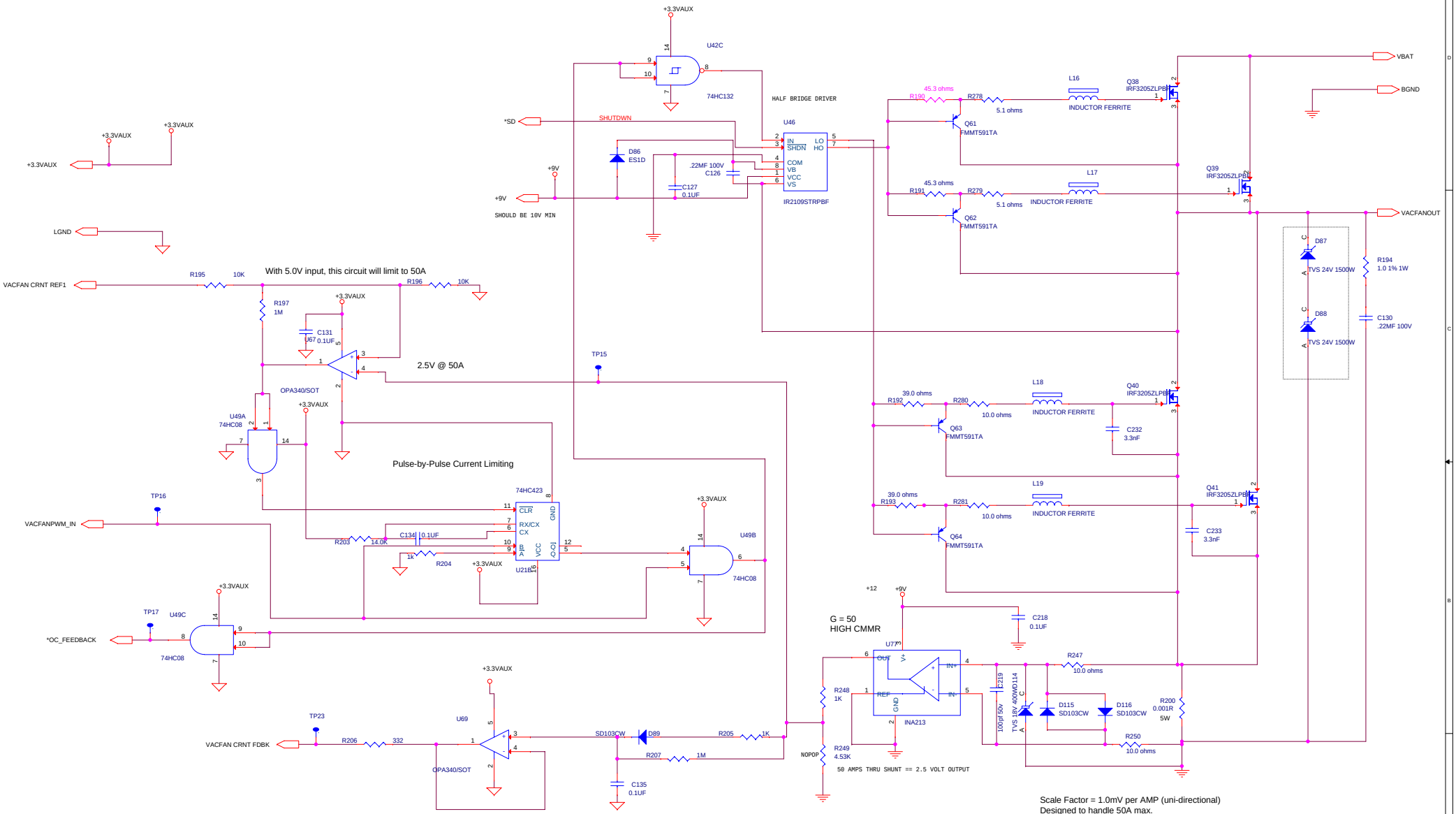
Vacuum Fan Control



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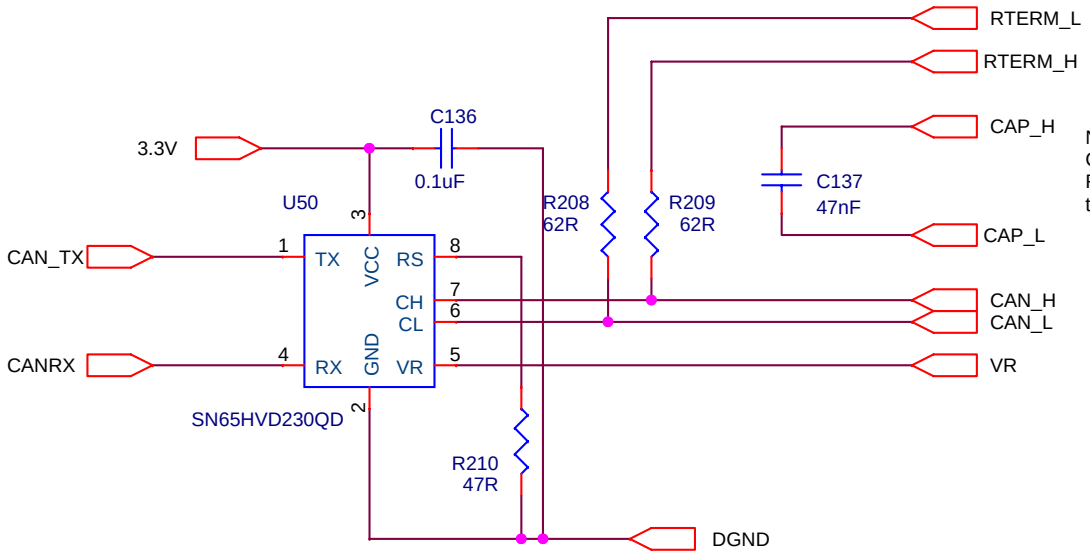
CANBUS



Note:
Connect RTERM_H and RTERM_L together when transceiver is at an end-point.

Note:
Connect CAP_H to both RTERM_H and RTERM_L. Connect CAP_L to DGND when transceiver is at an end-point.

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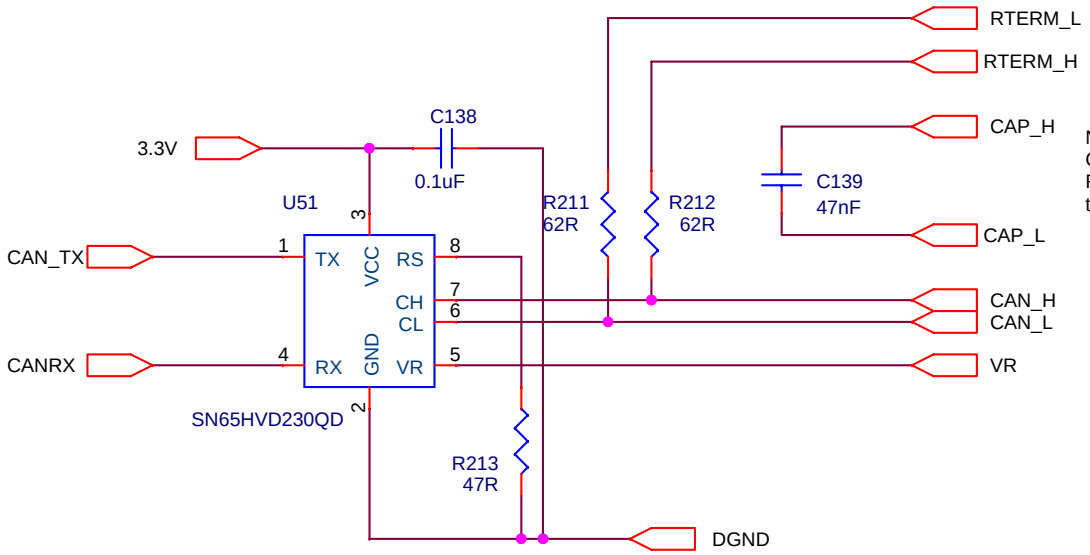
CANBUS



Note:
Connect RTERM_H and RTERM_L together when transceiver is at an end-point.

Note:
Connect CAP_H to both RTERM_H and RTERM_L. Connect CAP_L to DGND when transceiver is at an end-point.

Title: Modular - CANBUS		
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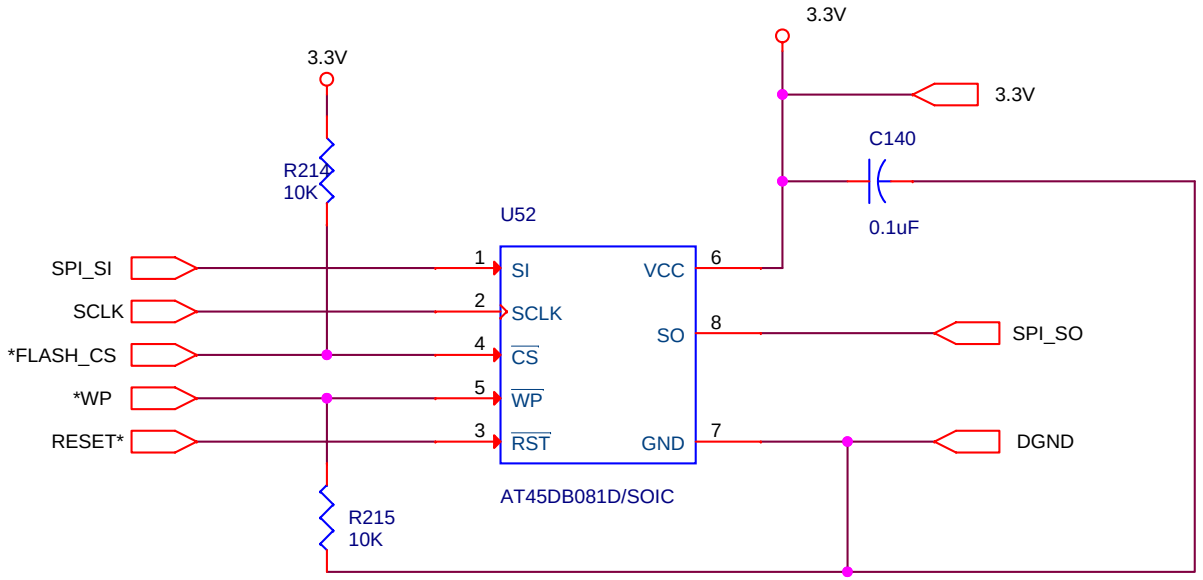
FLASH MEMORY



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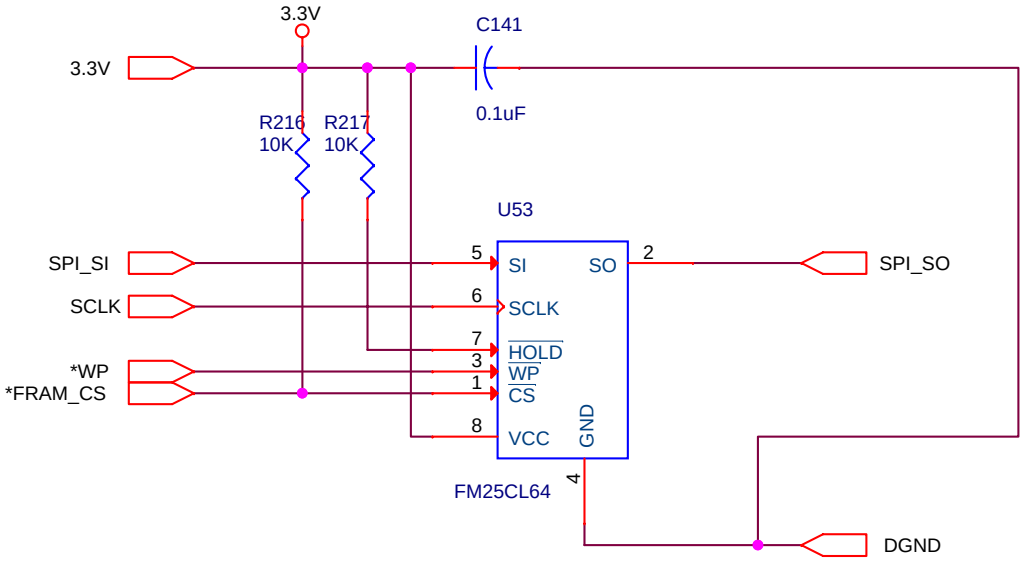
FRAM



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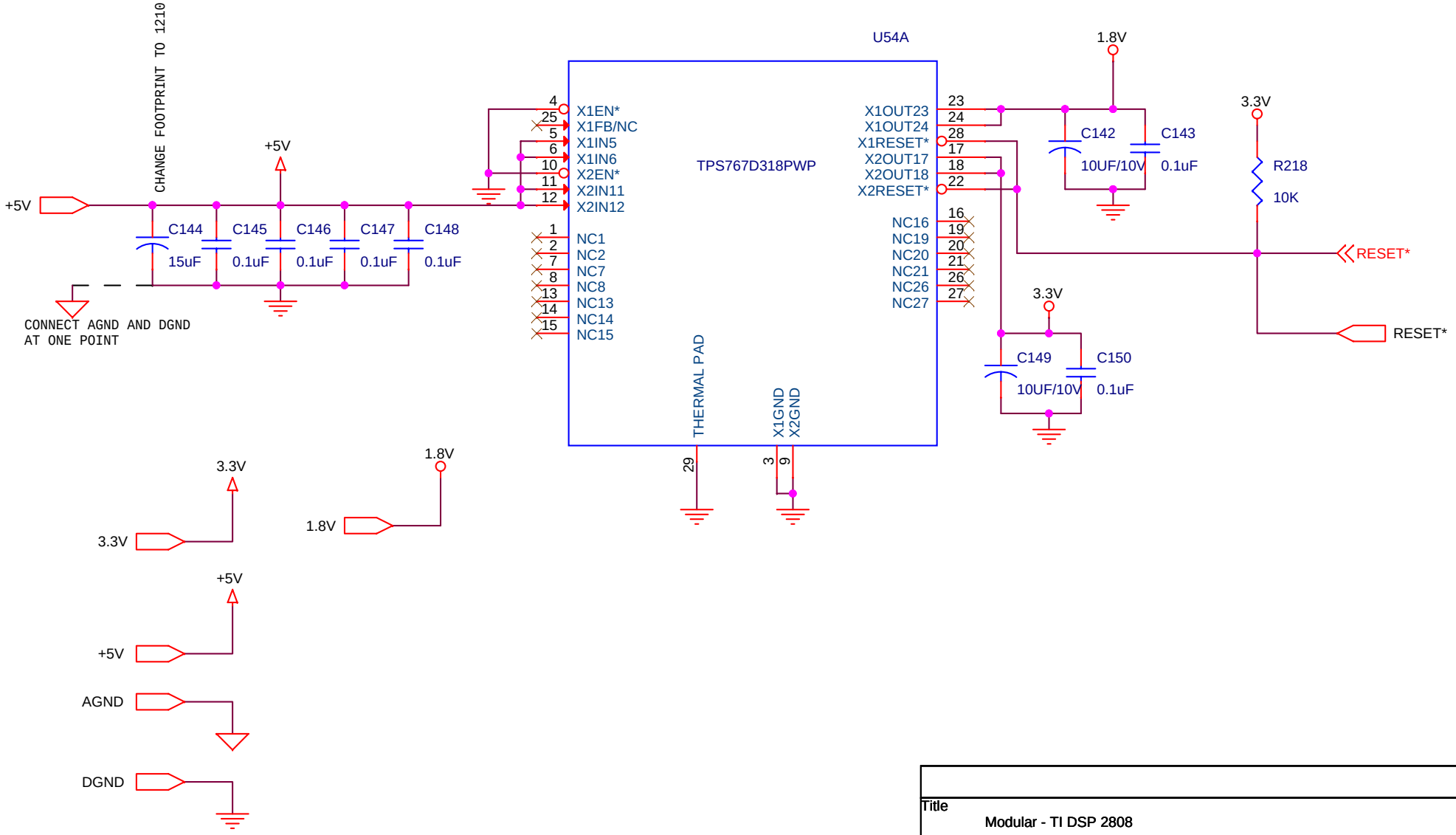
POWER REGULATOR



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