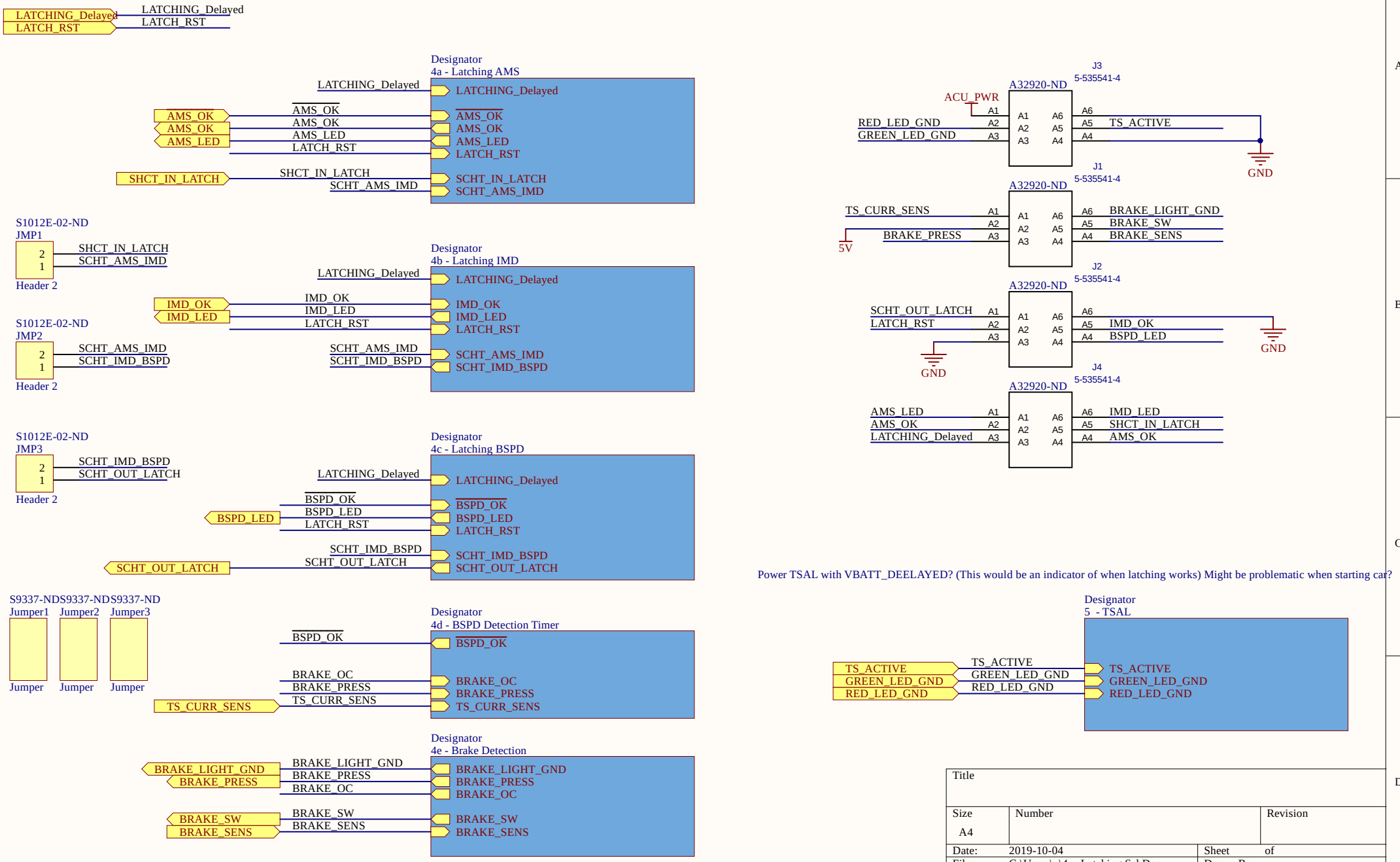
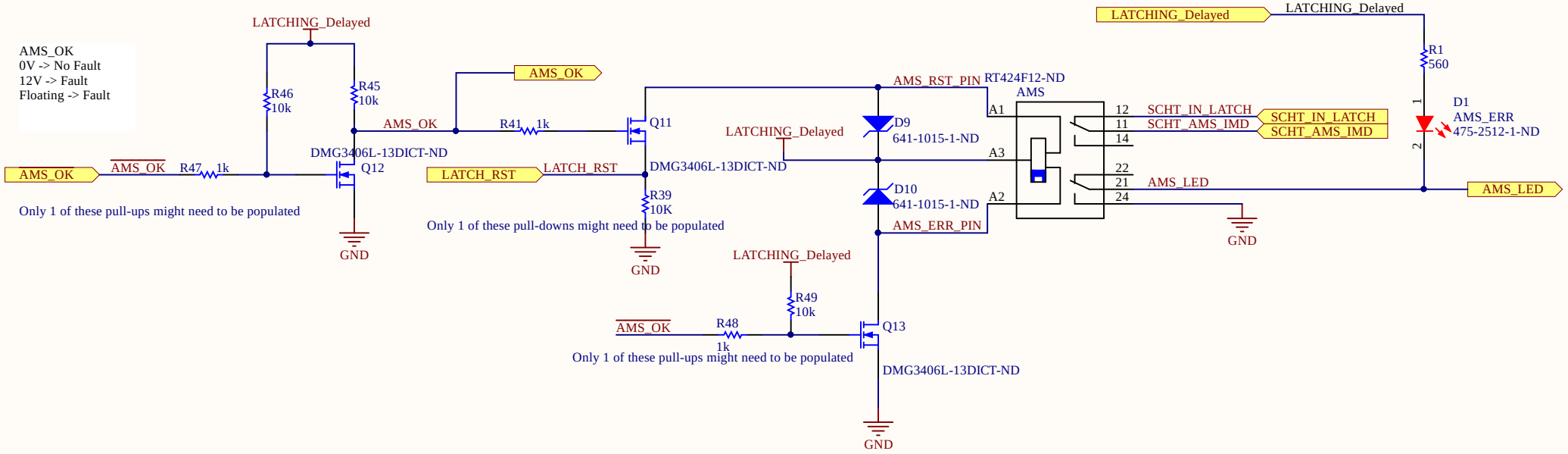

LATCHING_Delayed
LATCH_RST
Designator
4a - Latching AMS
AMS_OK
AMS_LED
SHCT_IN_LATCH
SCHT_AMS_IMD
S1012E-02-ND
JMP1
Header 2
Designator
4b - Latching IMD
IMD_OK
IMD_LED
S1012E-02-ND
JMP2
Header 2
S1012E-02-ND
JMP3
Header 2
Designator
4c - Latching BSPD
BSPD_OK
BSPD_LED
SCHT_OUT_LATCH
S9337-NDS9337-NDS9337-ND
Jumper1 Jumper2 Jumper3
Jumper Jumper Jumper
Designator
4d - BSPD Detection Timer
BRAKE_OC
BRAKE_PRESS
TS_CURR_SENS
Designator
4e - Brake Detection
BRAKE_LIGHT_GND
BRAKE_SW
BRAKE_SENS
J3
5-535541-4
A32920-ND
ACU_PWR
RED_LED_GND
GREEN_LED_GND
TS_ACTIVE
GND
J1
5-535541-4
A32920-ND
TS_CURR_SENS
BRAKE_PRESS
5V
BRAKE_LIGHT_GND
BRAKE_SW
BRAKE_SENS
J2
5-535541-4
A32920-ND
SCHT_OUT_LATCH
LATCH_RST
GND
IMD_OK
BSPD_LED
J4
5-535541-4
A32920-ND
AMS_LED
AMS_OK
LATCHING_Delayed
IMD_LED
SHCT_IN_LATCH
AMS_OK
Power TSAL with VBATT_DEELAYED? (This would be an indicator of when latching works) Might be problematic when starting car?
Designator
5 - TSAL
TS_ACTIVE
GREEN_LED_GND
RED_LED_GND
Title
Size
A4
Number
Revision
Date: 2019-10-04
Sheet of
File: C:\Users\..\4 - Latching.SchDoc
Drawn By:



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Date: 2019-10-04		Sheet of
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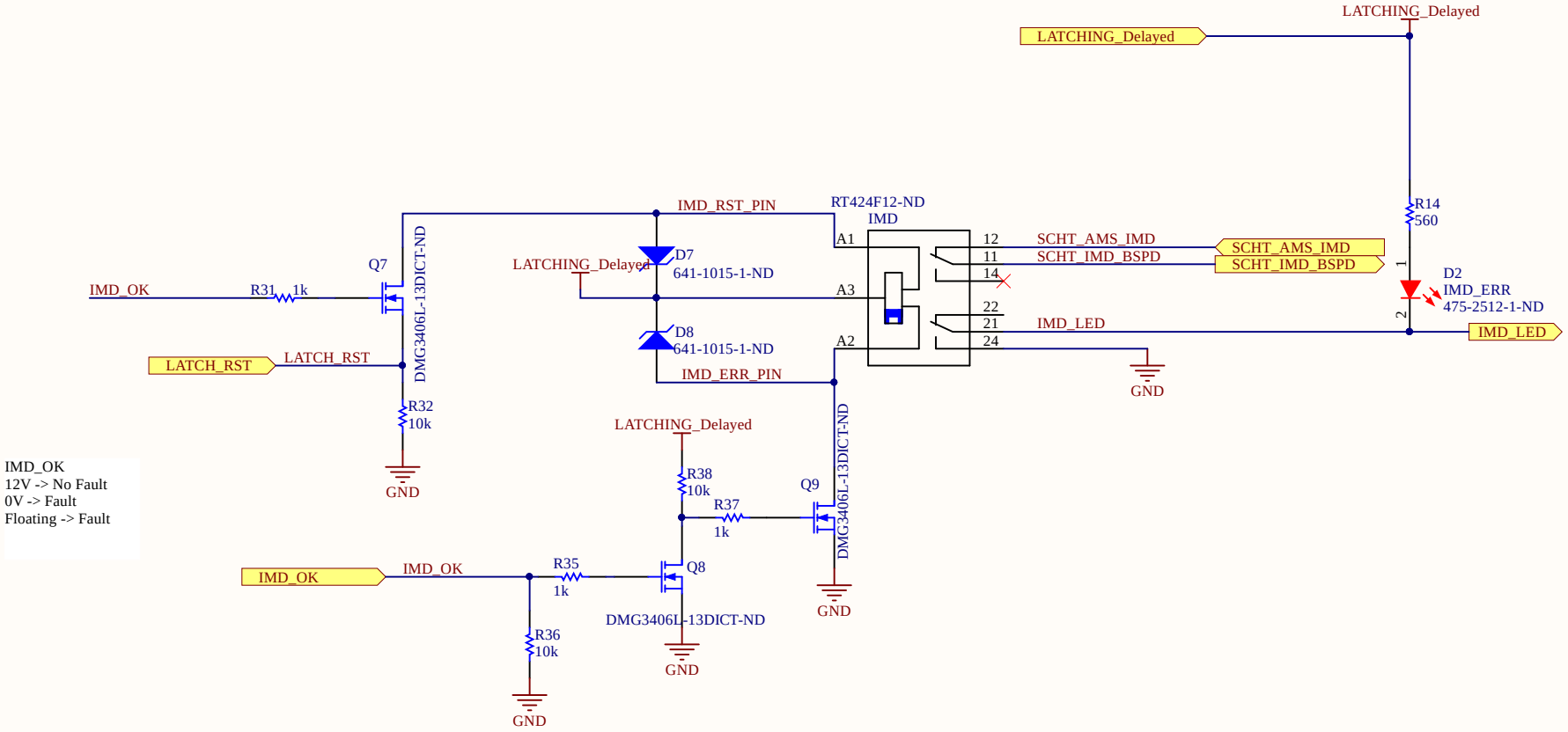
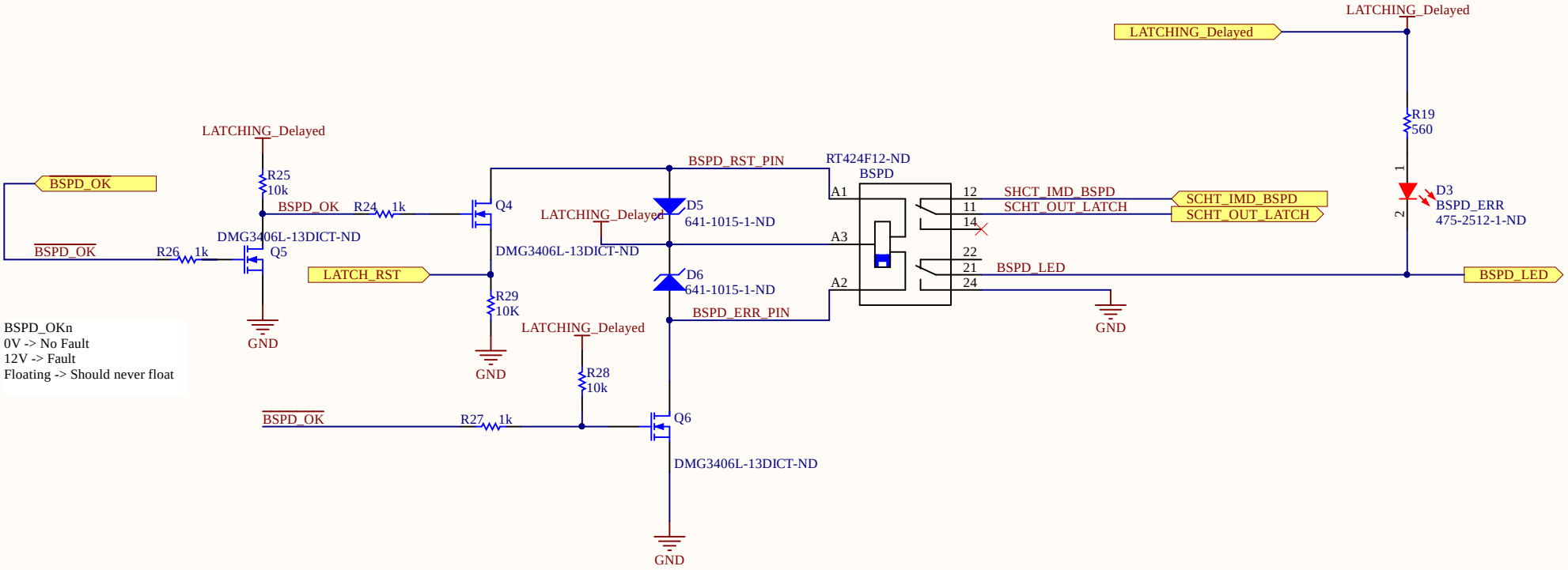
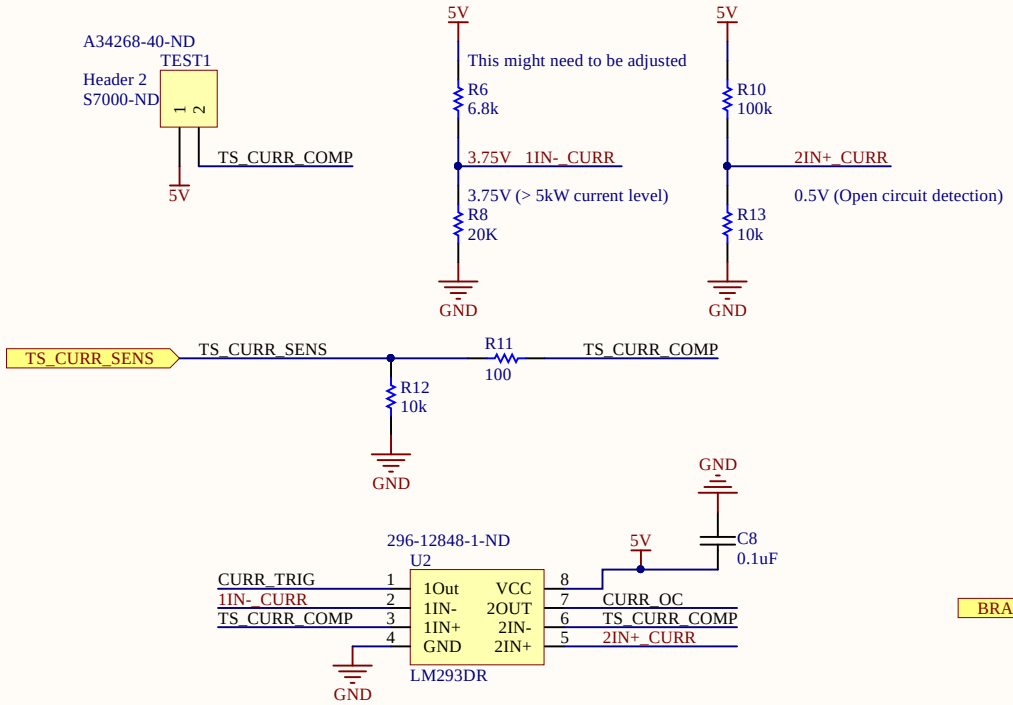


Title		
Size A4	Number	Revision
Date: 2019-10-04		Sheet of
File: C:\Users\..\4b - Latching IMD.SchDoc		Drawn By:



Title		
Size: A4	Number	Revision
Date: 2019-10-04		Sheet of
File: C:\Users\..\4c - Latching BSPD.SchDoc		Drawn By:

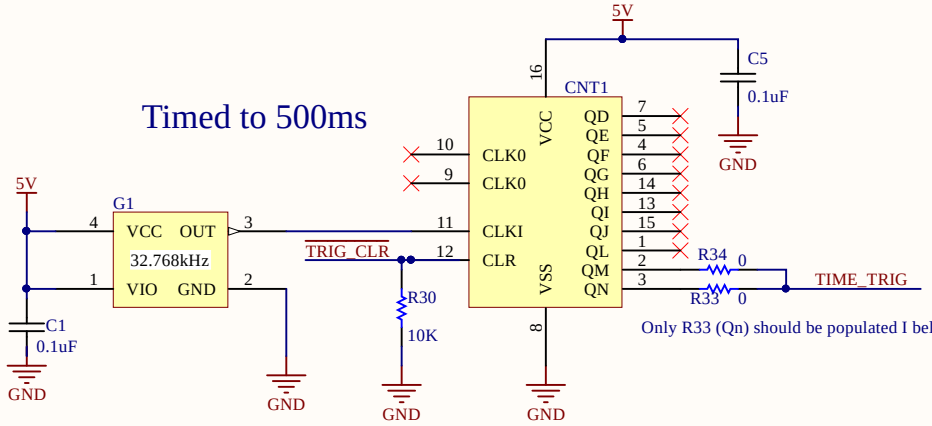
Current Sensor Comparator



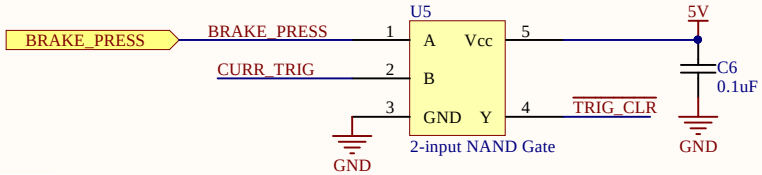
CURR_TRIG:
5V if TS_CURR_COMP > 1IN-_CURR (3.75V)
0V if TS_CURR_COMP < 1IN-_CURR (3.75V)

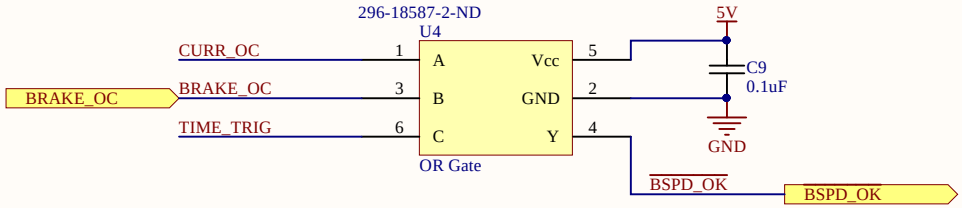
CURR_OC:
0V if TS_CURR_COMP > 2IN+_CURR (0.5V)
5V if TS_CURR_COMP < 2IN+_CURR(0.5V)

Timed to 500ms

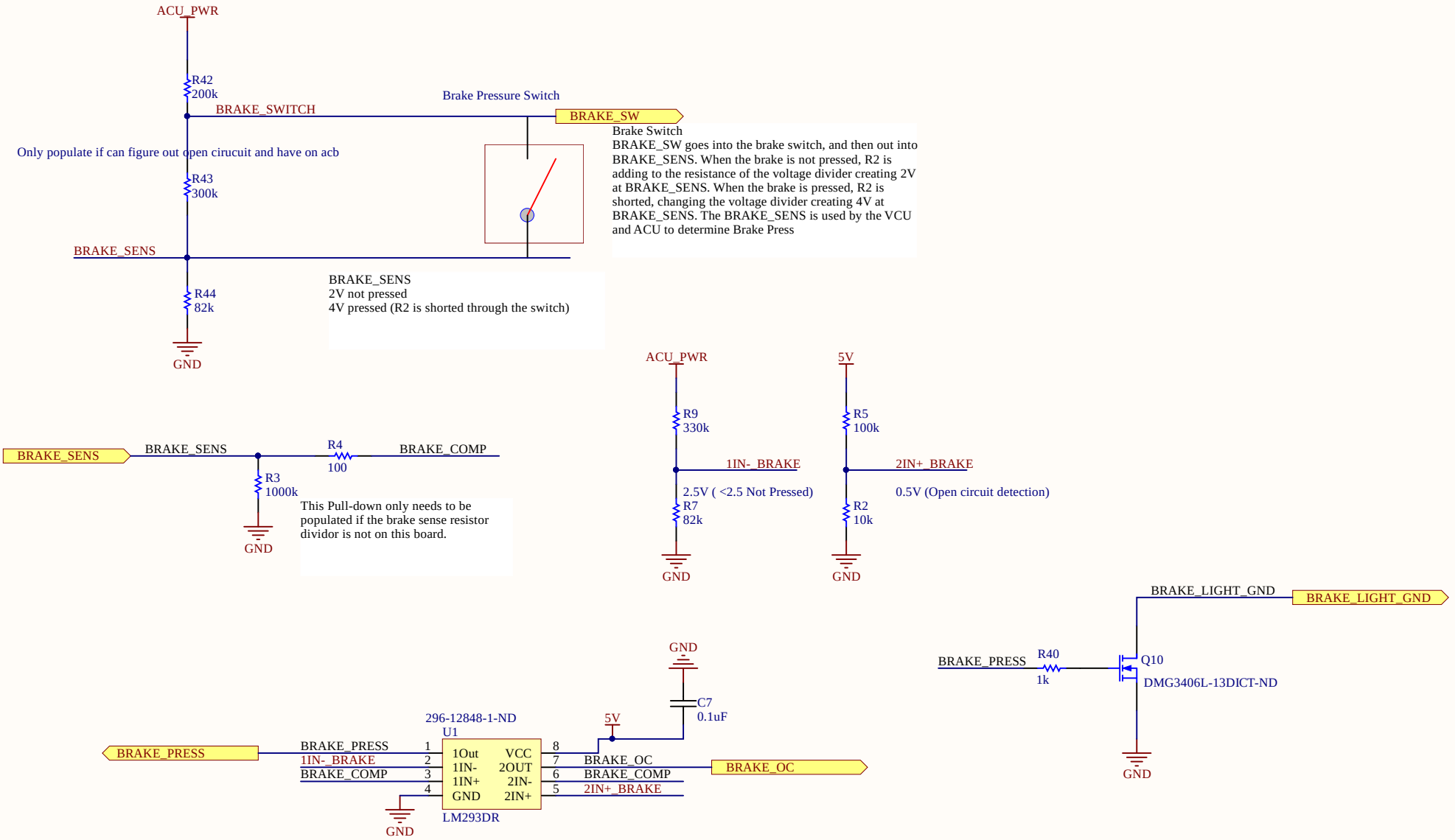


NAND to reset counter





Title		
Size: A4	Number	Revision
Date: 2019-10-04	Sheet of	
File: C:\Users\...\4d - BSPD Detection Timer.SchDoc	Drawn By:	


ACU_PWR
R42
200k
BRAKE_SWITCH
Brake Pressure Switch
BRAKE_SW
Only populate if can figure out open cirucuit and have on acb
R43
300k
BRAKE_SENS
R44
82k
GND
Brake Switch
BRAKE_SW goes into the brake switch, and then out into BRAKE_SENS. When the brake is not pressed, R2 is adding to the resistance of the voltage divider creating 2V at BRAKE_SENS. When the brake is pressed, R2 is shorted, changing the voltage divider creating 4V at BRAKE_SENS. The BRAKE_SENS is used by the VCU and ACU to determine Brake Press
BRAKE_SENS
2V not pressed
4V pressed (R2 is shorted through the switch)
BRAKE_SENS
BRAKE_SENS
R4
100
BRAKE_COMP
R3
1000k
GND
This Pull-down only needs to be populated if the brake sense resistor dividor is not on this board.
ACU_PWR
R9
330k
1IN-_BRAKE
2.5V (<2.5 Not Pressed)
R7
82k
GND
5V
R5
100k
2IN+_BRAKE
0.5V (Open circuit detection)
R2
10k
GND
BRAKE_LIGHT_GND
BRAKE_LIGHT_GND
BRAKE_PRESS
R40
1k
Q10
DMG3406L-13DICT-ND
GND
GND
C7
0.1uF
296-12848-1-ND
U1
5V
BRAKE_PRESS
BRAKE_PRESS
1IN-_BRAKE
BRAKE_COMP
1
2
3
4
1Out
1IN-
1IN+
GND
VCC
2OUT
2IN-
2IN+
8
7
6
5
BRAKE_OC
BRAKE_COMP
2IN+_BRAKE
BRAKE_OC
GND
LM293DR
BRAKE_PRESS:
5V if BRAKE_COMP > 1IN-_BRAKE (2.5V) (Pressed)
0V if BRAKE_COMP < 1IN-_BRAKE (2.5V) (not pressed)
BRAKE_OC:
0V if BRAKE_COMP > 2IN+_BRAKE (0.5V)
5V if BRAKE_COMP < 2IN+_BRAKE (0.5V)
Title
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Number
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Date:
2019-10-04
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of
File:
C:\Users\..\4e - Brake Detection.SchDoc
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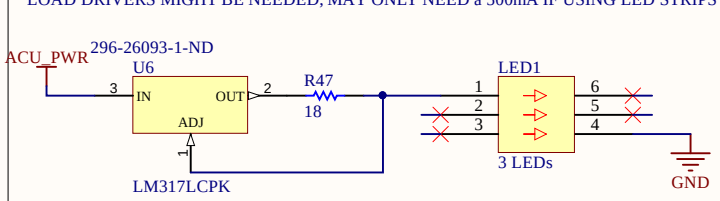
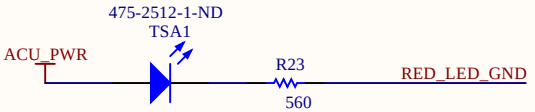
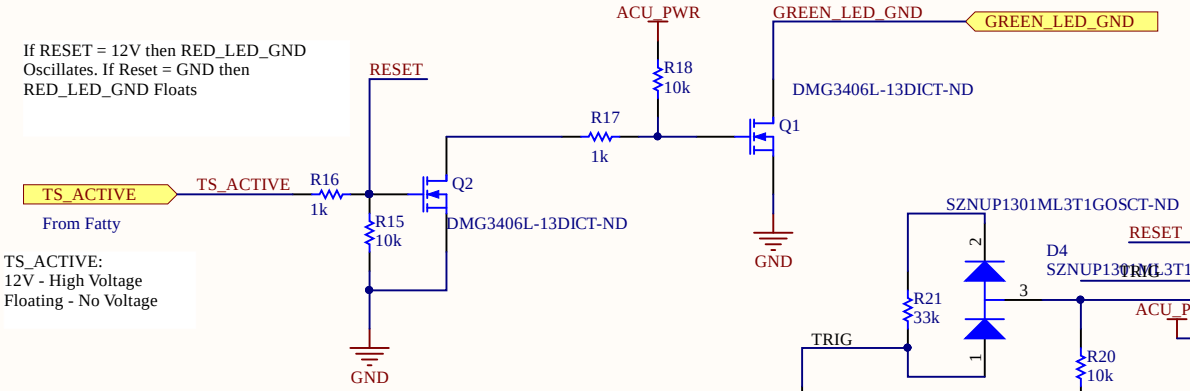
LOAD DRIVERS MIGHT BE NEEDED, MAY ONLY NEED a 500mA IF USING LED STRIPS DEPENDING ON TESTS





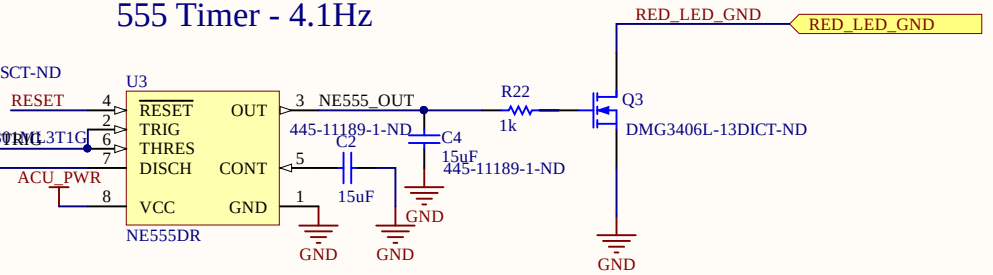
If RESET = 12V then RED_LED_GND Oscillates. If Reset = GND then RED_LED_GND Floats

TS_ACTIVE:
12V - High Voltage
Floating - No Voltage



Check values on current TSAL for timing

555 Timer - 4.1Hz



The Addition of these resistors controls the Frequency. The Division controls the Duty cycle. Increasing the resistor on top deacreases the duty cycle. Try to keep the addition constant. NEEDS TO BE TESTED. (I just used the ESD Diodes but might need to find other ones) Cap at output might not be

Title		
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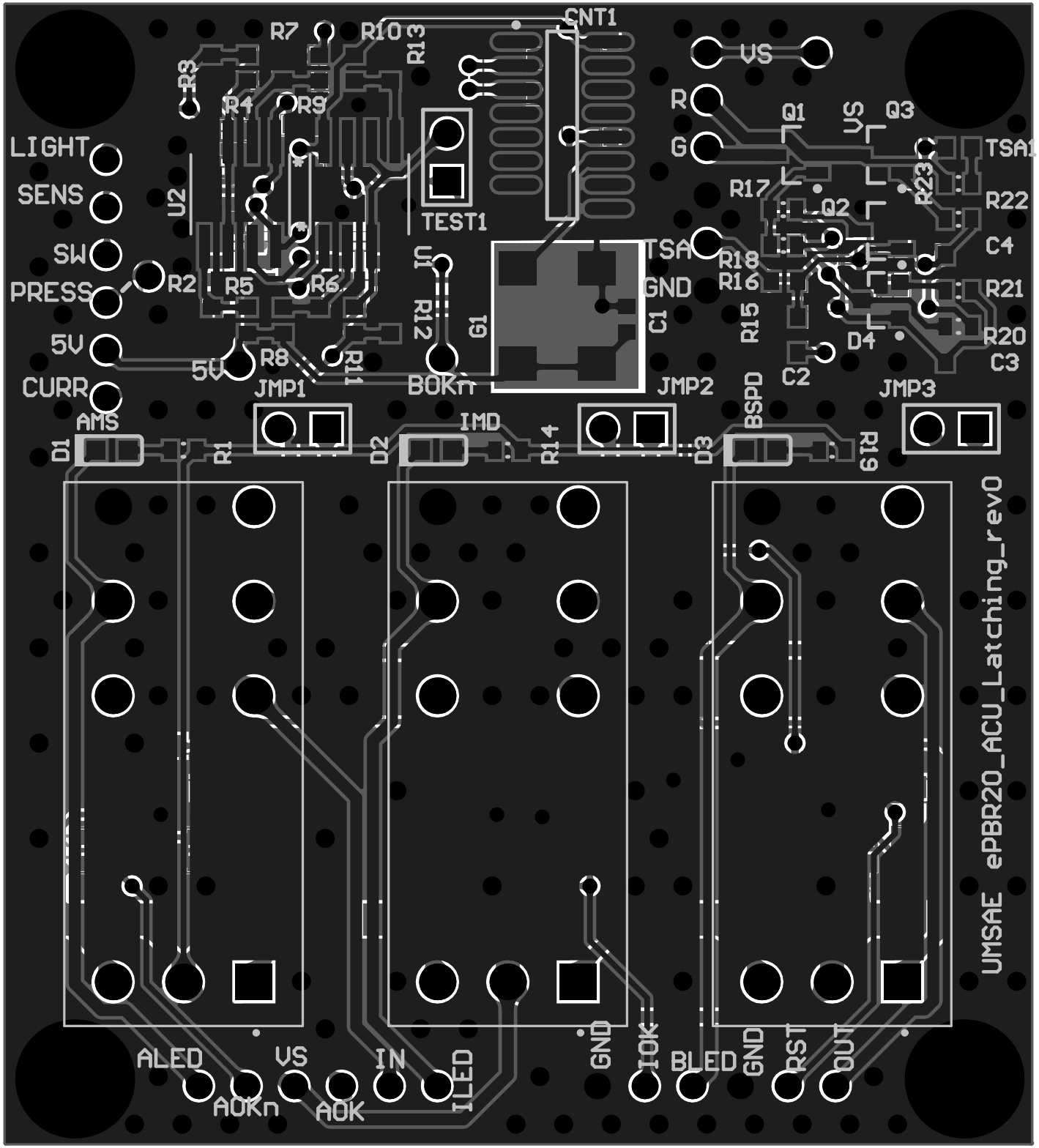
CNT1
R7
R10
R13
R3
R4
R9
LIGHT
SENS
SW
PRESS
5V
CURR
U2
R2
R5
R6
R8
R11
R12
5V
TEST1
IN
G1
BOKn
JMP1
AMS
D1
R1
IMD
D2
R14
JMP2
D3
BSPD
R19
JMP3
VS
R
G
Q1
VS
Q3
TSA1
R17
Q2
R23
R22
TSA
R18
R16
GND
C1
R15
C4
R21
D4
R20
C2
C3
ALED
VS
IN
AOKn
AOK
ILED
GND
IOK
BLED
GND
RST
OUT
UMSAE ePBR20_ACU_Latching_rev0