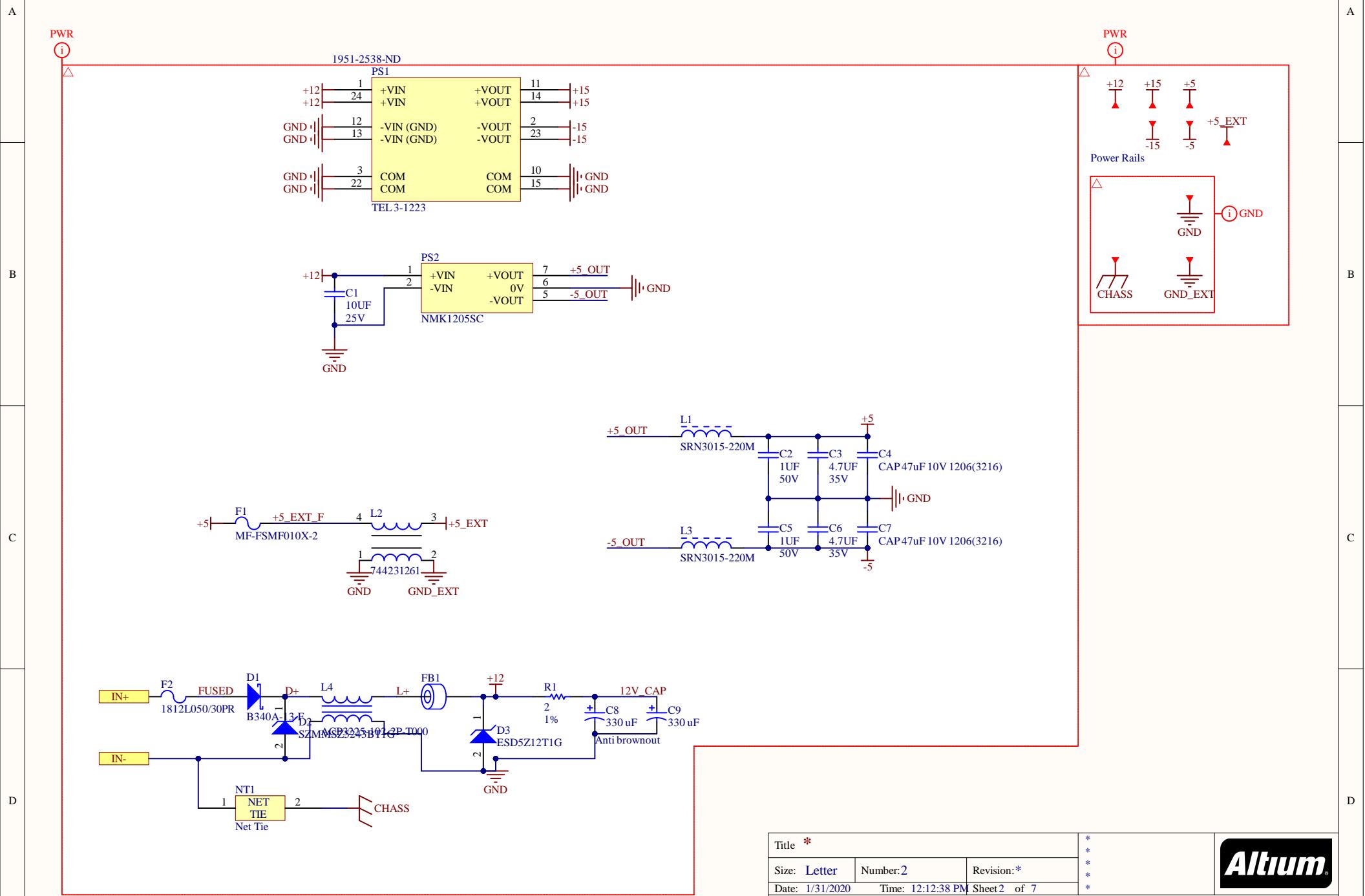


Current Sensor P/N: HAS 400-S

Brake Sensor P/N: MLH02KPSB06A

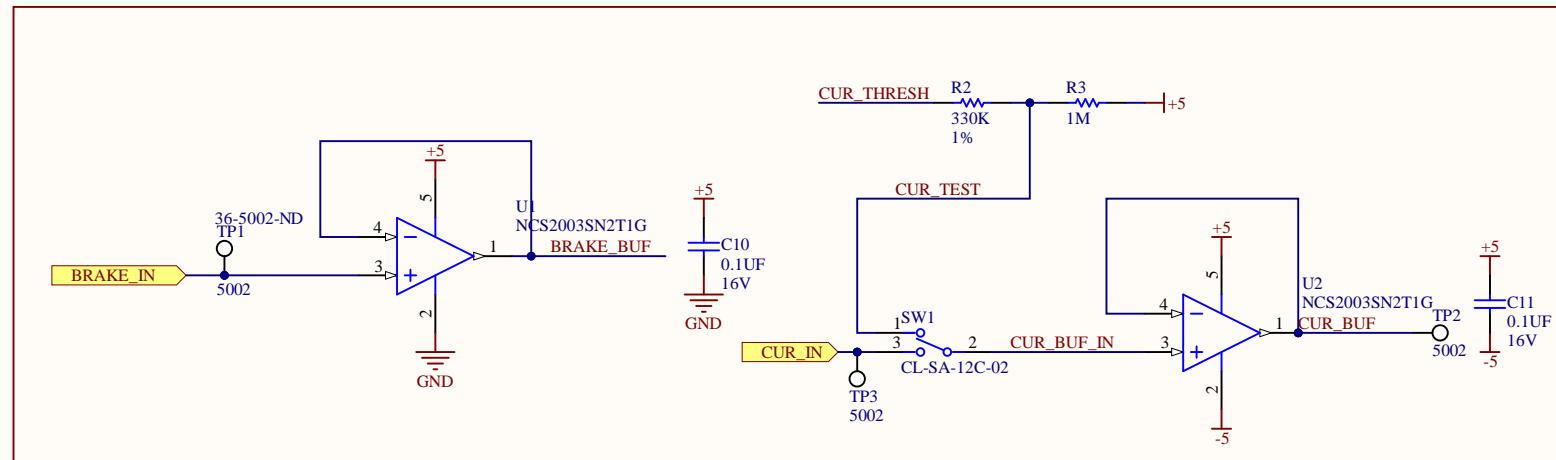
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Size:	Letter	Number:	1	Revision:	A01
Date:	1/31/2020	Time:	12:12:38 PM	Sheet:	1 of 7
File:	C:\Git\AERO_2019-2020\BSPD-2019-2020\TOP.SchDoc				





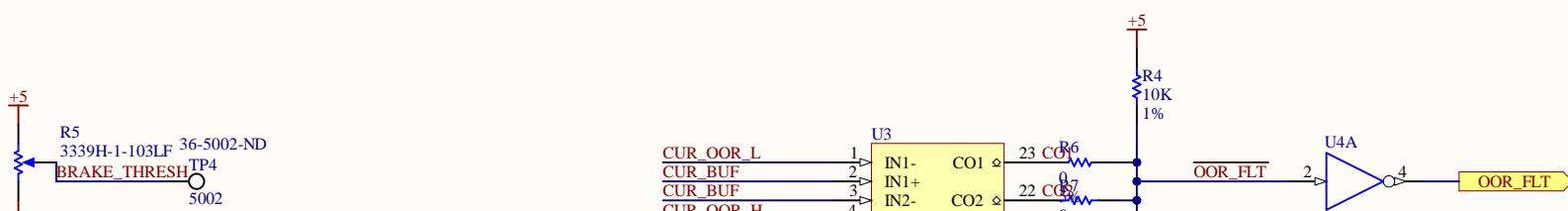
Title *		
Size: Letter	Number: 2	Revision: *
Date: 1/31/2020	Time: 12:12:38 PM	Sheet 2 of 7
File: C:\Git\AERO_2019-2020\BSPD-2019-2020\Power Supply.SchDoc		

A



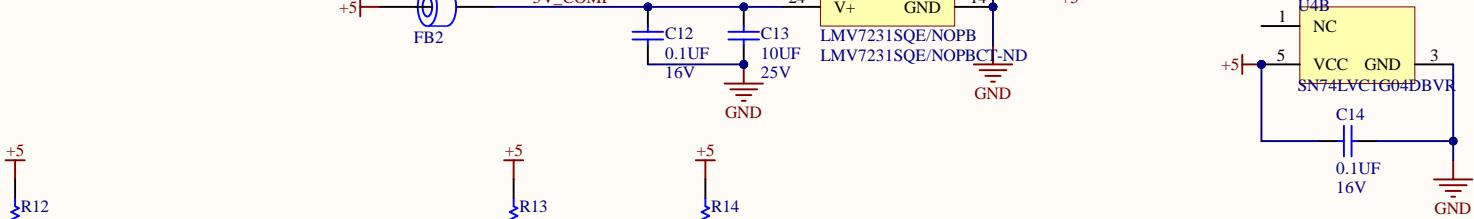
A

B



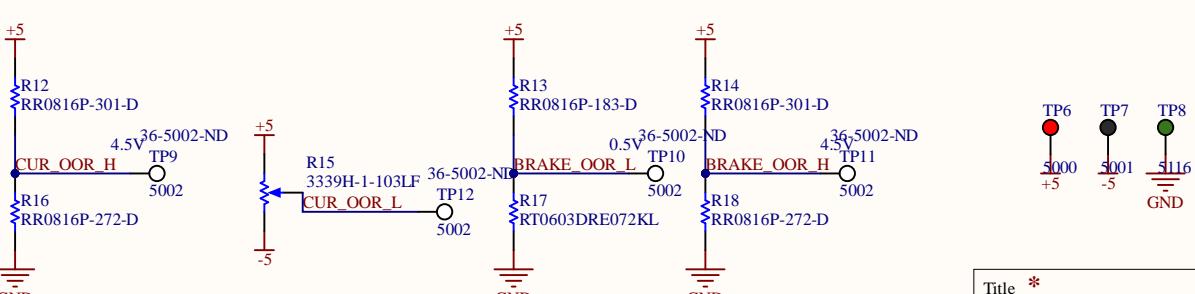
B

C



C

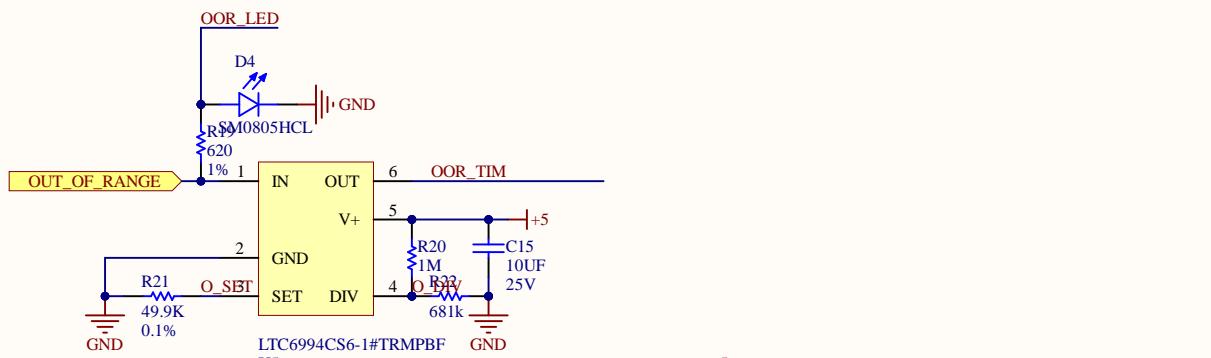
D



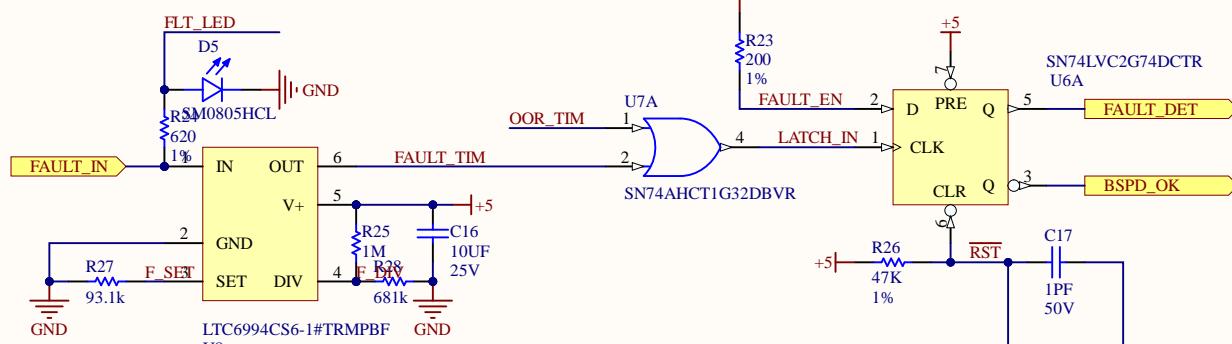
D

Title *		
Size: Letter	Number: 3	Revision: *
Date: 1/31/2020	Time: 12:12:38 PM	Sheet 3 of 7
File: C:\Git\AERO_2019-2020\BSPD-2019-2020\Comparator.SchDoc		

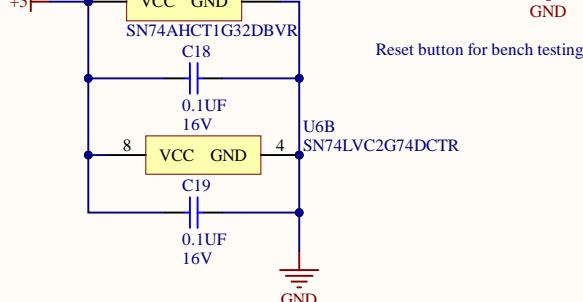
A



B



C



D

Title *			*
Size: Letter	Number: 4	Revision: *	*
Date: 1/31/2020	Time: 12:12:39 PM	Sheet 4 of 7	*
File: C:\Git\AERO_2019-2020\BSPD-2019-2020\LatchDelay.SchDoc			*

A

A

B

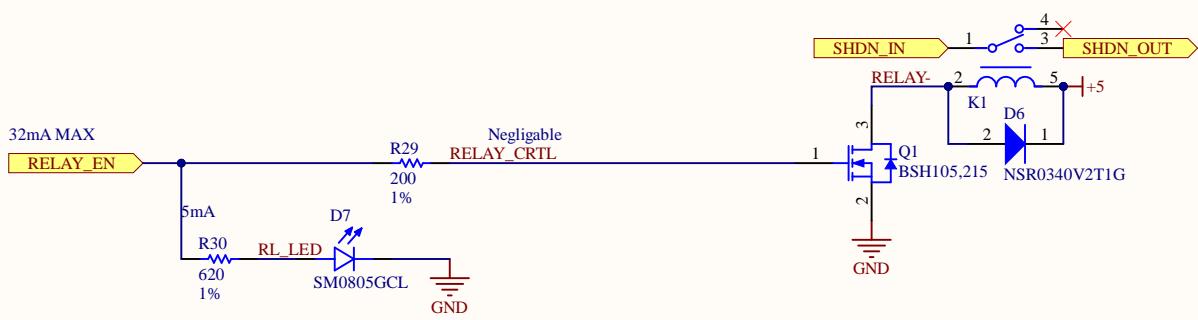
B

C

C

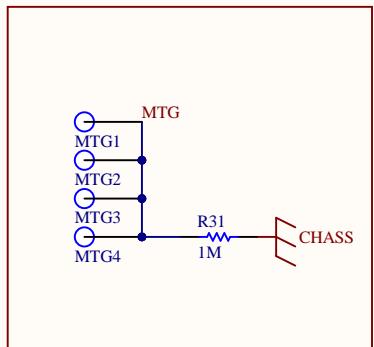
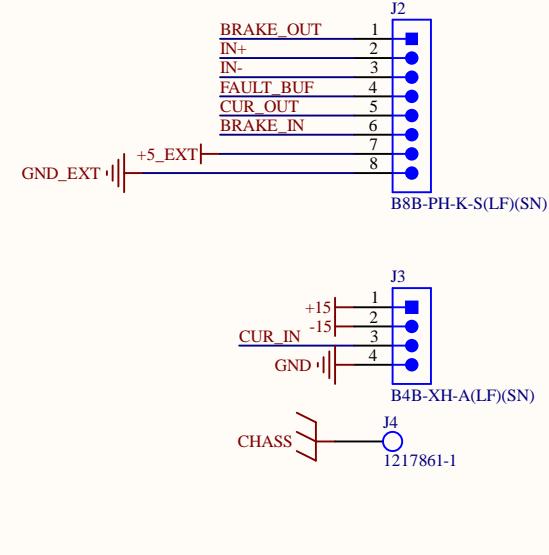
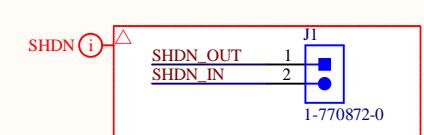
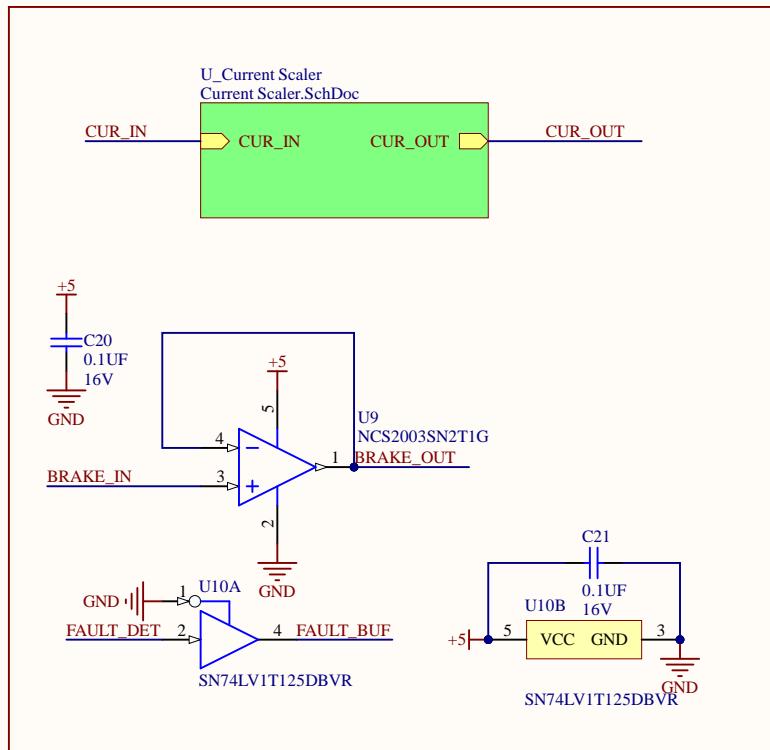
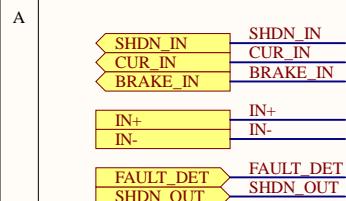
D

D

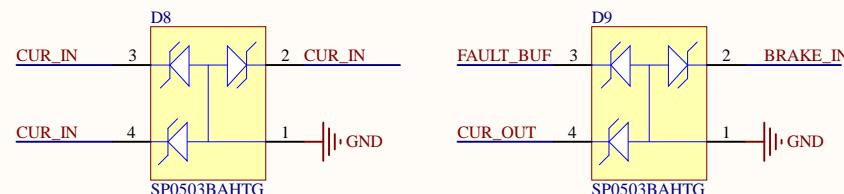


Title *			*
Size: Letter	Number: 5	Revision: *	*
Date: 1/31/2020	Time: 12:12:39 PM	Sheet 5 of 7	*
File: C:\Git\AERO_2019-2020\BSPD-2019-2020\Relay.SchDoc			*





P1	PIN1	PIN2
172165-1	SXH-001T-P0.6	SXH-001T-P0.6
172165-1	SXH-001T-P0.6	SXH-001T-P0.6
PIN3	PHR-4	PHR-4
770904-1	770904-1	770904-1
PIN5	JP1	JP1
770904-1	A08KR08KR26E152B	A08KR08KR26E152B
770904-1		



D

Title

Size	Number	Revision
Letter		
Date:	1/31/2020	Sheet of
File:	C:\Git\..\\IO and Connectors.SchDoc	Drawn By:

A

A

B

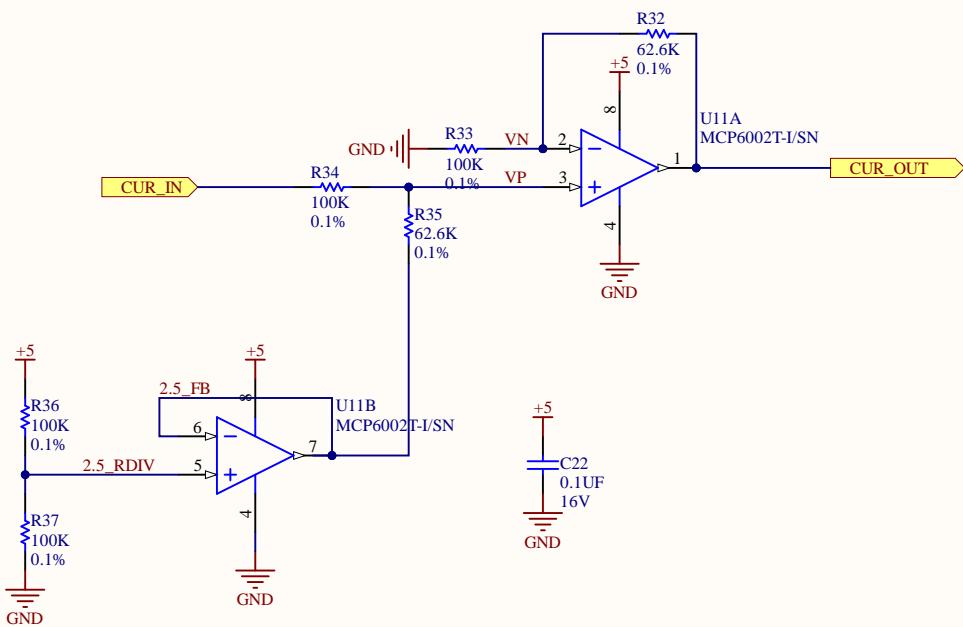
B

C

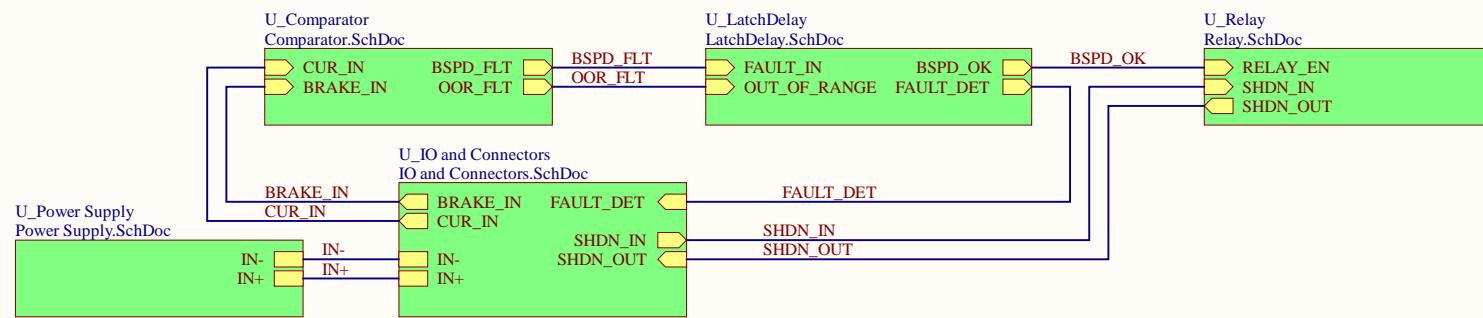
C

D

D



Title *			*
Size: Letter	Number: 7	Revision: *	*
Date: 1/31/2020	Time: 12:12:40 PM	Sheet 7 of 7	*
File: C:\Git\AERO_2019-2020\BSPD-2019-2020\Current Scaler.SchDoc			*

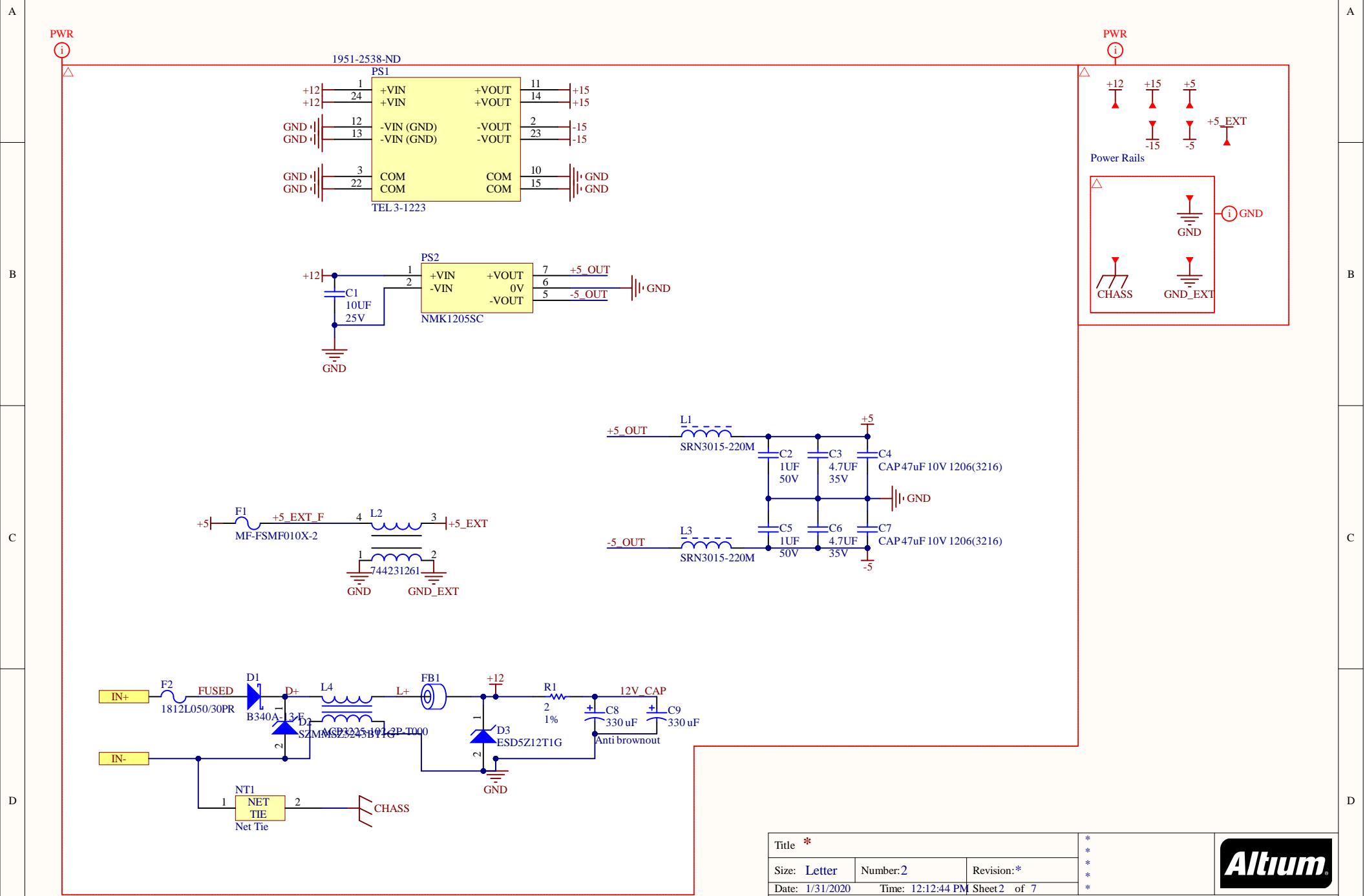


Current Sensor P/N: HAS 400-S

Brake Sensor P/N: MLH02KPSB06A

Title *			*
Size: Letter	Number: 1	Revision: A01	*
Date: 1/31/2020	Time: 12:12:43 PM	Sheet 1 of 7	*
File: C:\Git\AERO_2019-2020\BSPD-2019-2020\TOP.SchDoc			*

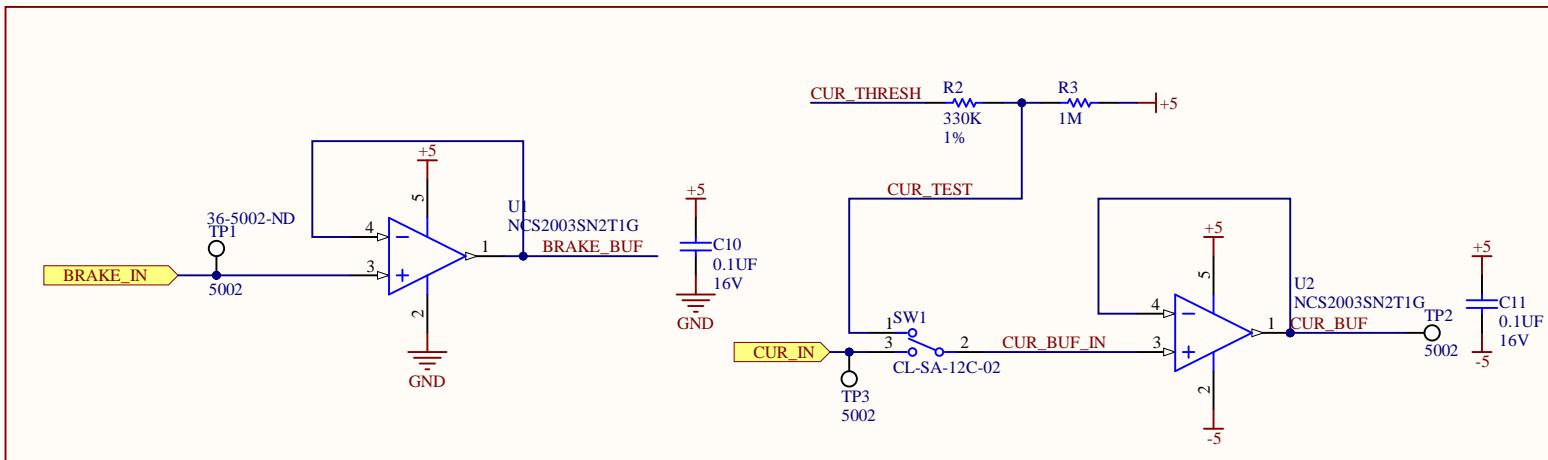




Title *		
Size: Letter	Number: 2	Revision: *
Date: 1/31/2020	Time: 12:12:44 PM	Sheet 2 of 7
File: C:\Git\AERO_2019-2020\BSPD-2019-2020\Power Supply.SchDoc	*	*

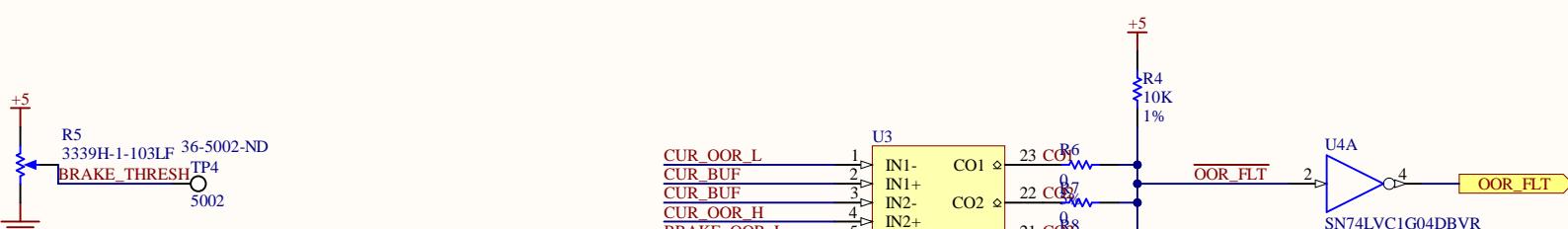
Altium

A



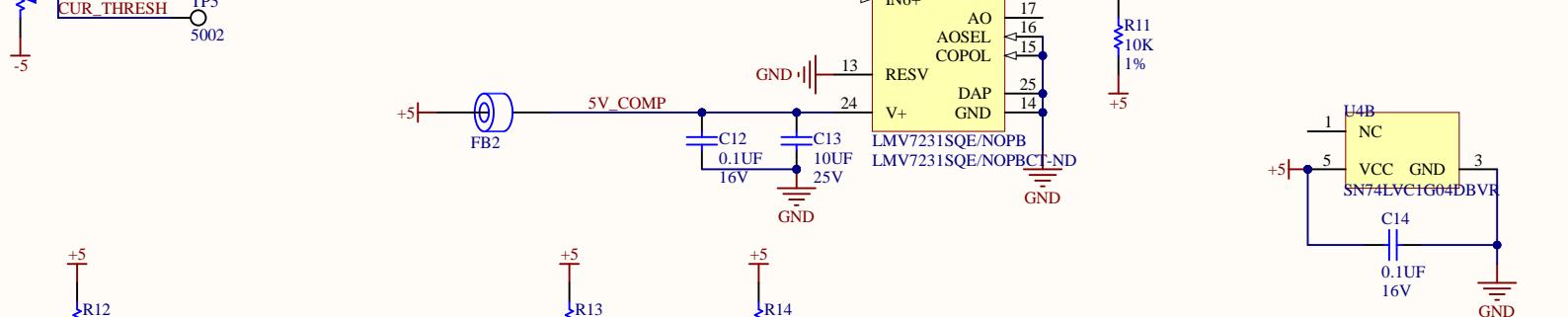
A

B



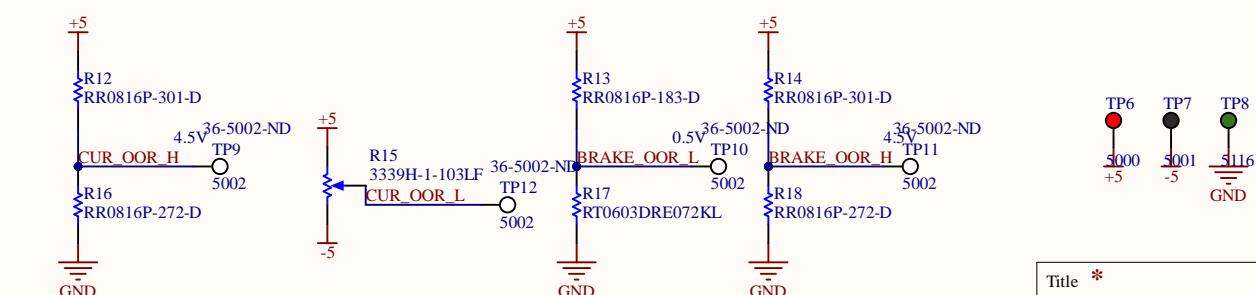
B

C



C

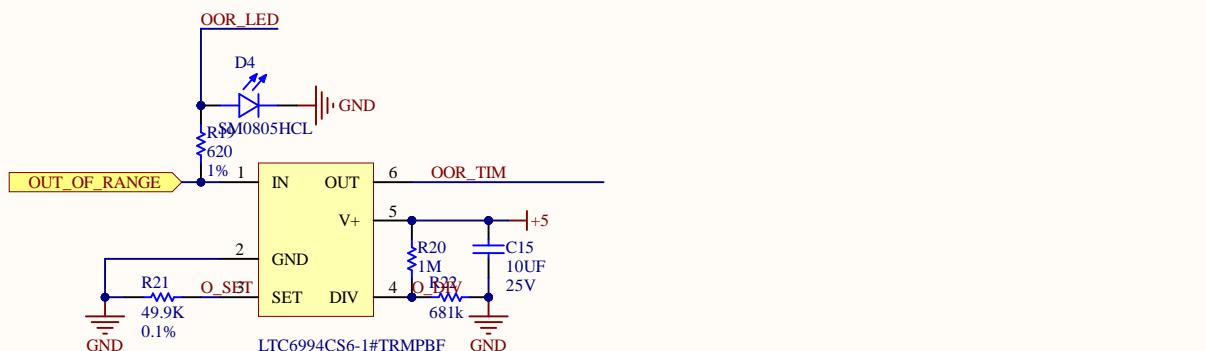
D



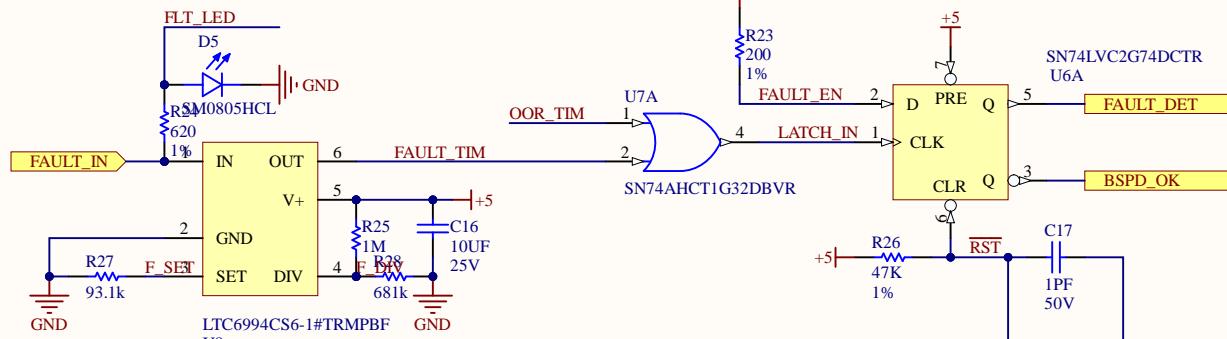
D

Title *			*
Size: Letter	Number: 3	Revision: *	*
Date: 1/31/2020	Time: 12:12:44 PM	Sheet 3 of 7	*
File: C:\Git\AERO_2019-2020\BSPD-2019-2020\Comparator.SchDoc			*

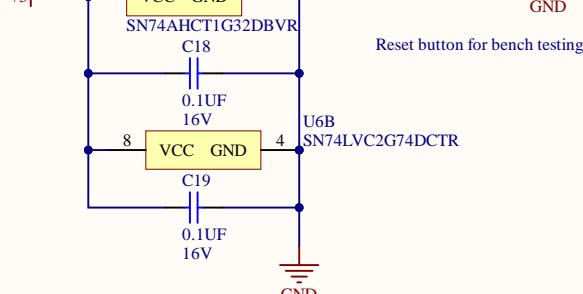
A



B



C



D

Title *		
Size: Letter	Number: 4	Revision: *
Date: 1/31/2020	Time: 12:12:44 PM	Sheet 4 of 7
File: C:\Git\AERO_2019-2020\BSPD-2019-2020\LatchDelay.SchDoc		

A

A

B

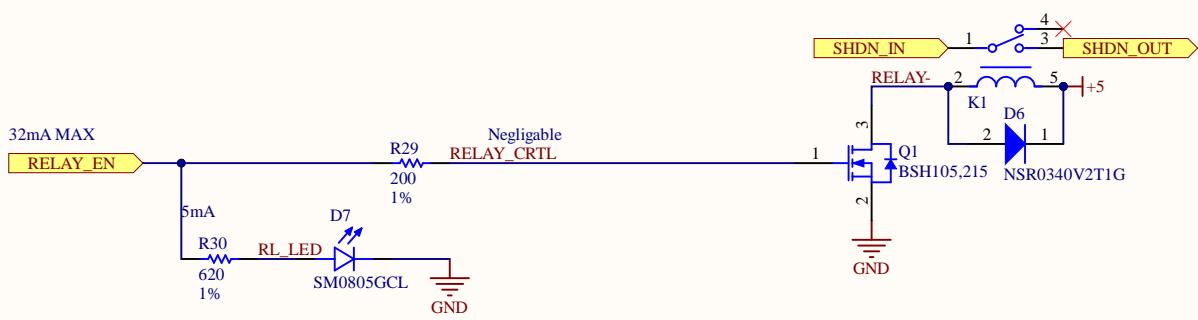
B

C

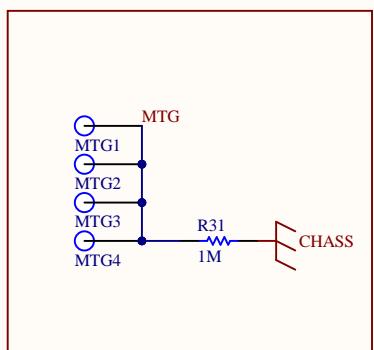
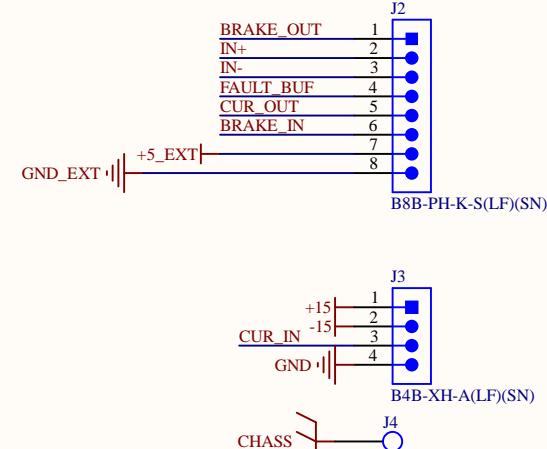
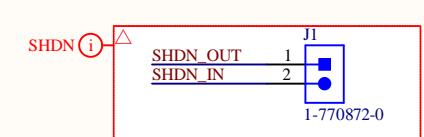
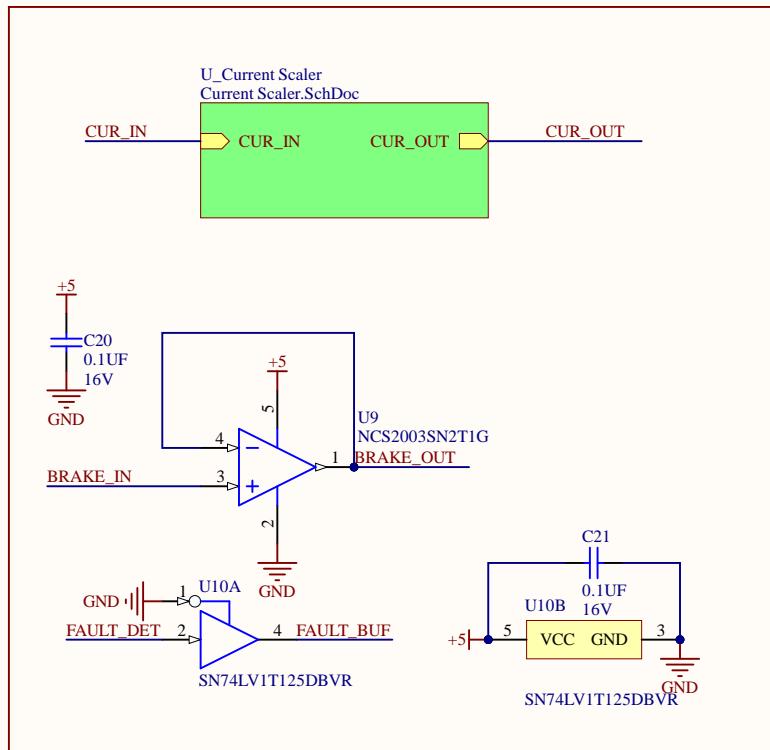
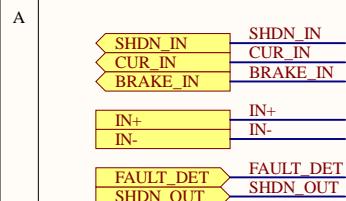
C

D

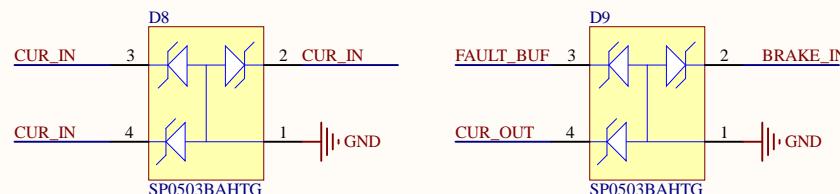
D



Title *			*
Size: Letter	Number: 5	Revision: *	*
Date: 1/31/2020	Time: 12:12:44 PM	Sheet 5 of 7	*
File: C:\Git\AERO_2019-2020\BSPD-2019-2020\Relay.SchDoc			*



P1	PIN1	PIN2
172165-1	SXH-001T-P0.6	SXH-001T-P0.6
172165-1	SXH-001T-P0.6	SXH-001T-P0.6
PIN3	PHR-4	PHR-4
770904-1	770904-1	770904-1
PIN5	JP1	JP1
770904-1	A08KR08KR26E152B	A08KR08KR26E152B
770904-1		



D

Title

Size	Number	Revision
Letter		
Date:	1/31/2020	Sheet of
File:	C:\Git\..\\IO and Connectors.SchDoc	Drawn By:

A

A

B

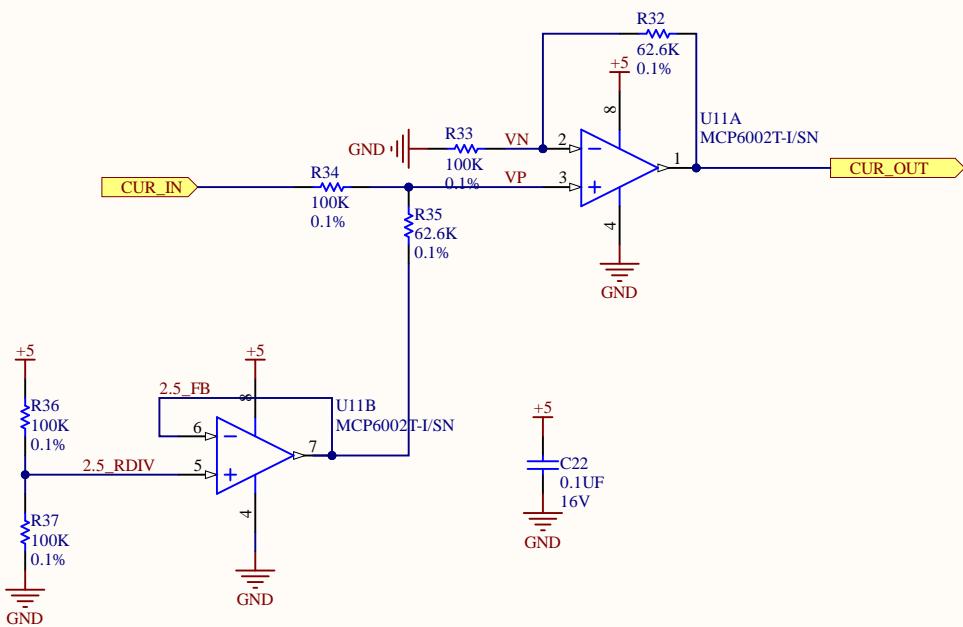
B

C

C

D

D



Title *			*
Size: Letter	Number: 7	Revision: *	*
Date: 1/31/2020	Time: 12:12:45 PM	Sheet 7 of 7	*
File: C:\Git\AERO_2019-2020\BSPD-2019-2020\Current Scaler.SchDoc			*



A

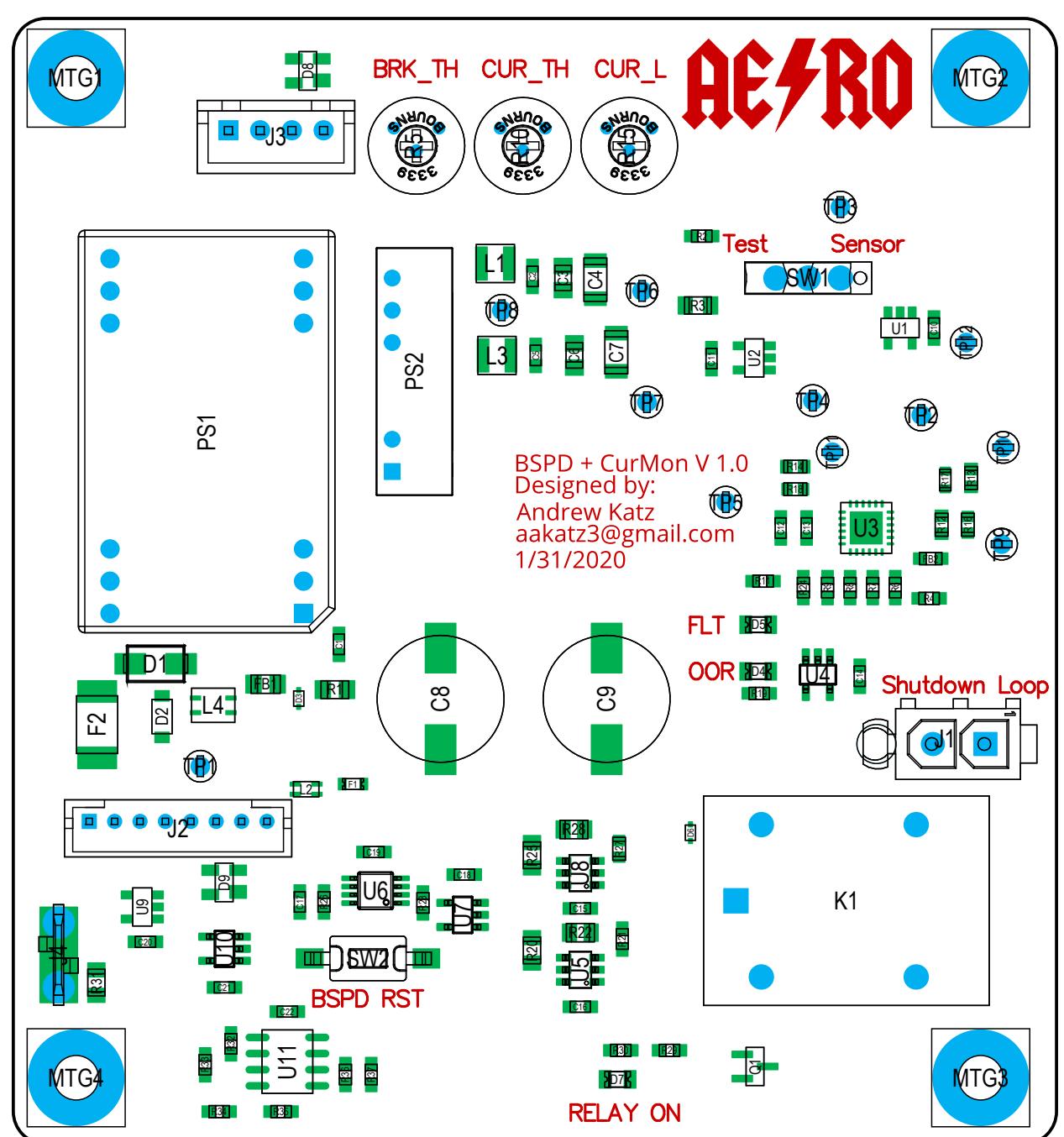
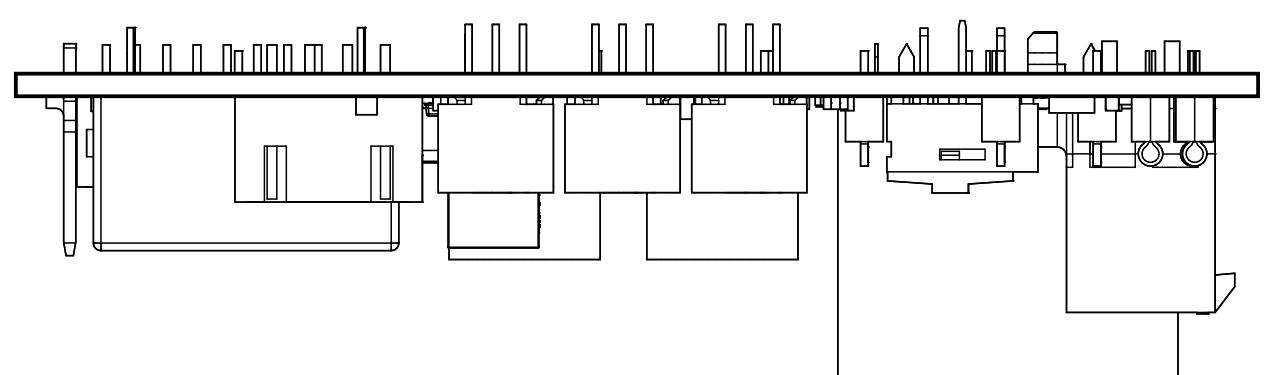
B

C

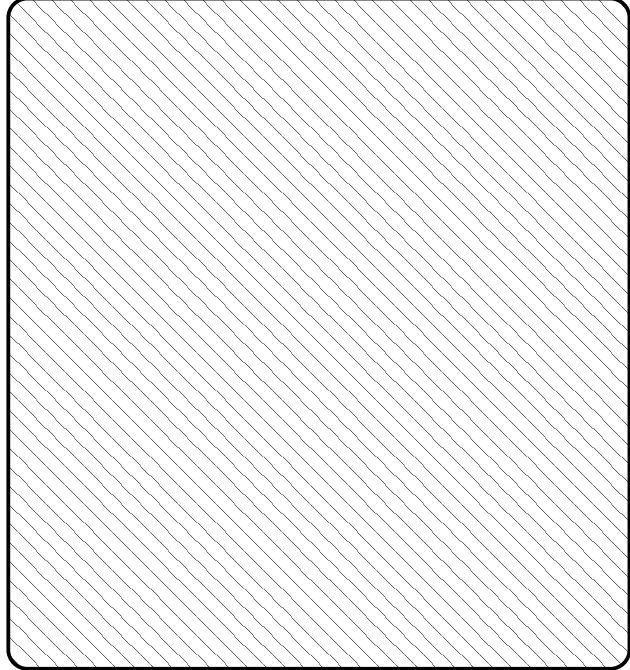
D

E

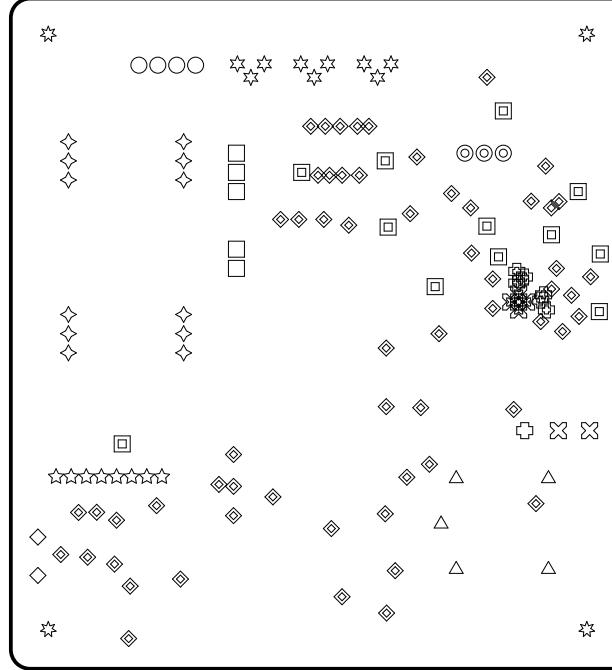
F



Region View (Scale 1:1)



Drill Drawing View (Scale 1:1)



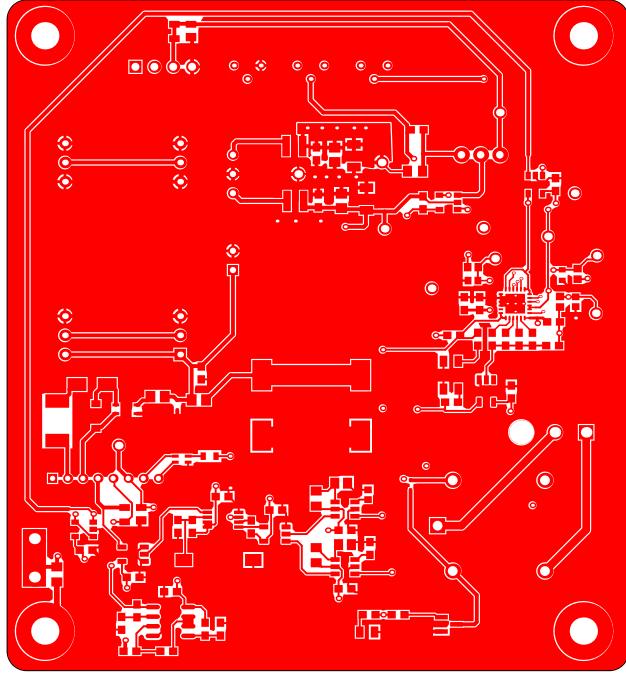
Drill Table

Symbol	Count	Hole Size	Type
☒	5	7.87mil	Plated
▣	7	9.00mil	Plated
◇	60	15.00mil	Plated
☆	9	20.00mil	Plated
★	8	27.56mil	Plated
◆	12	30.00mil	Plated
□	5	32.28mil	Plated
○	3	39.37mil	Plated
■	12	40.00mil	Plated
○	4	41.73mil	Plated
△	5	51.18mil	Plated
✗	2	55.00mil	Plated
◇	2	57.00mil	Plated
✚	1	125.00mil	Non-Plated
✳	4	142.00mil	Plated
139 Total			

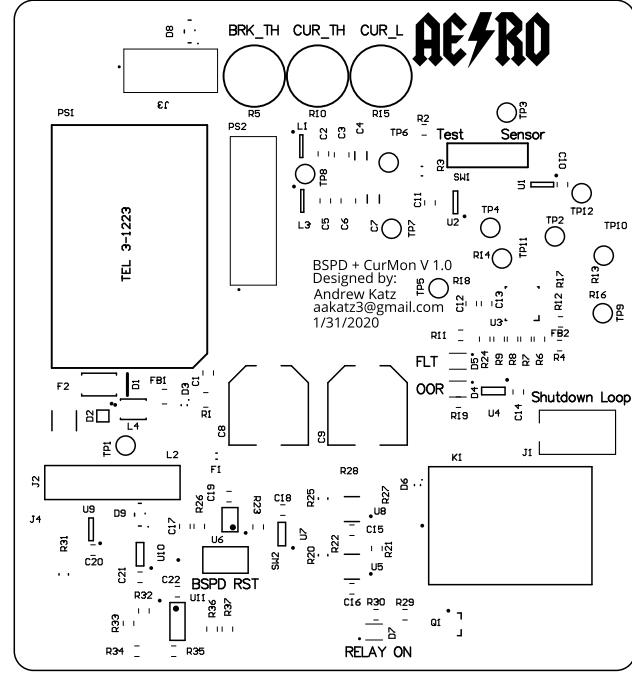
Layer Stack Legend



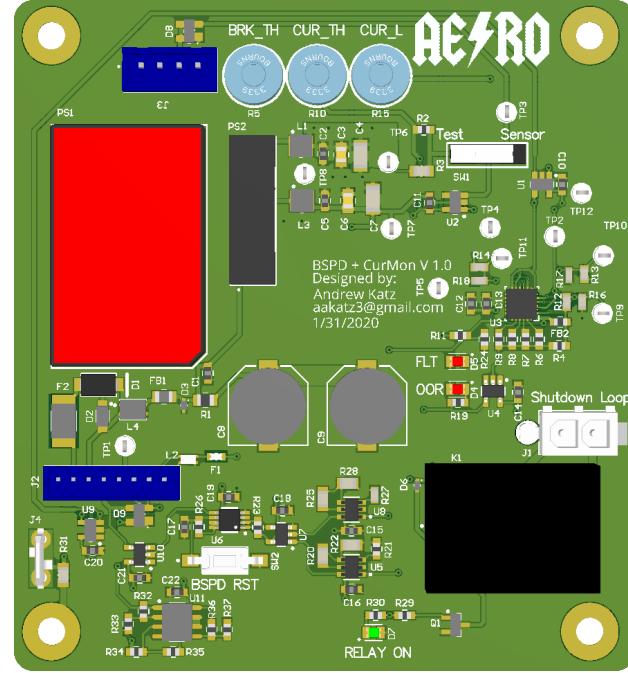
A Top Layer (Scale 1:1)



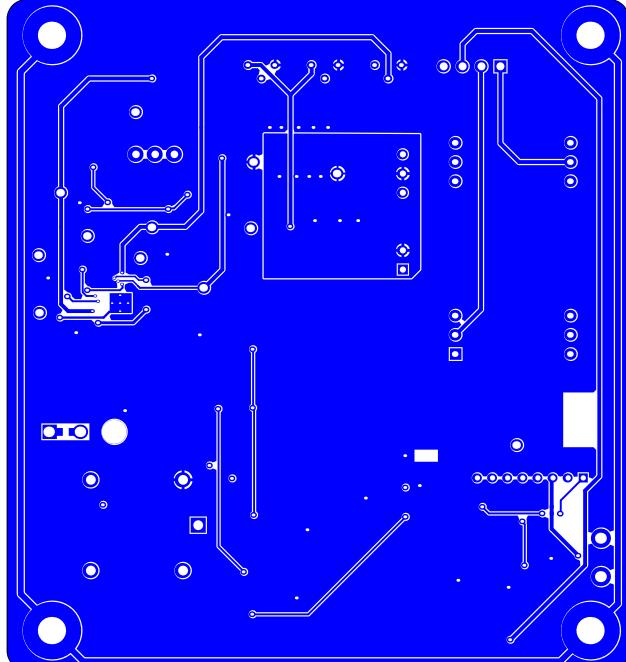
B Top Overlay (Scale 1:1)



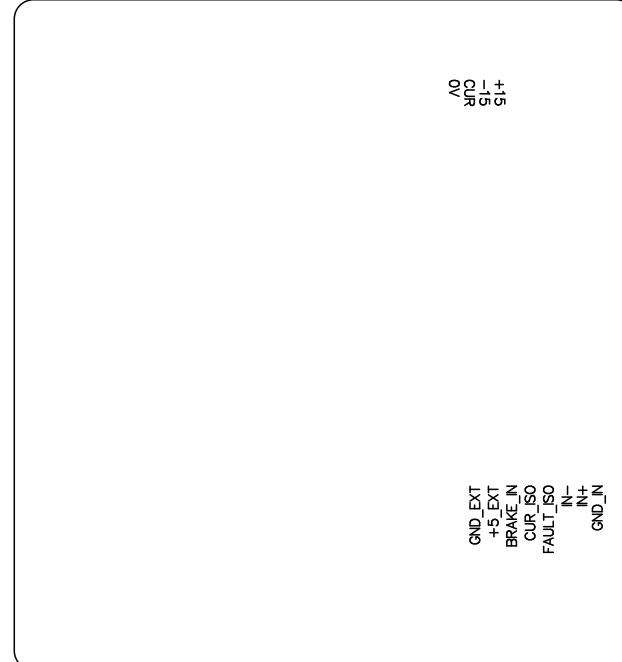
C Realistic View



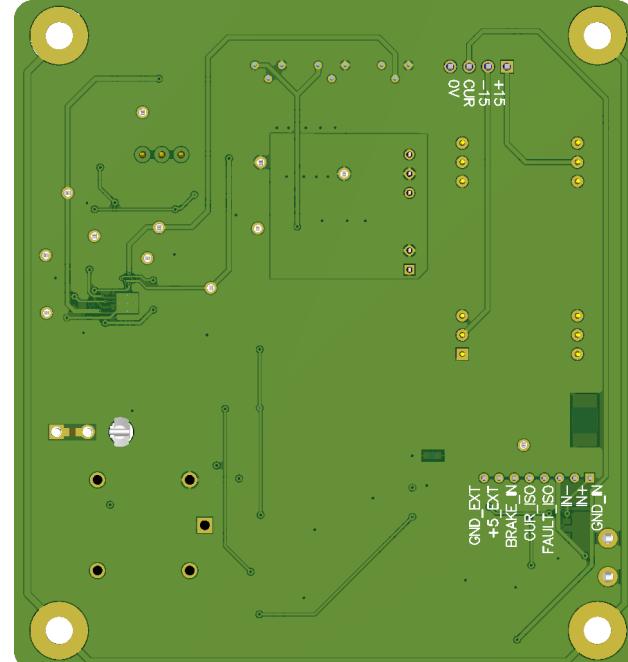
D Bottom Layer (Scale 1:1)



E Bottom Overlay (Scale 1:1)



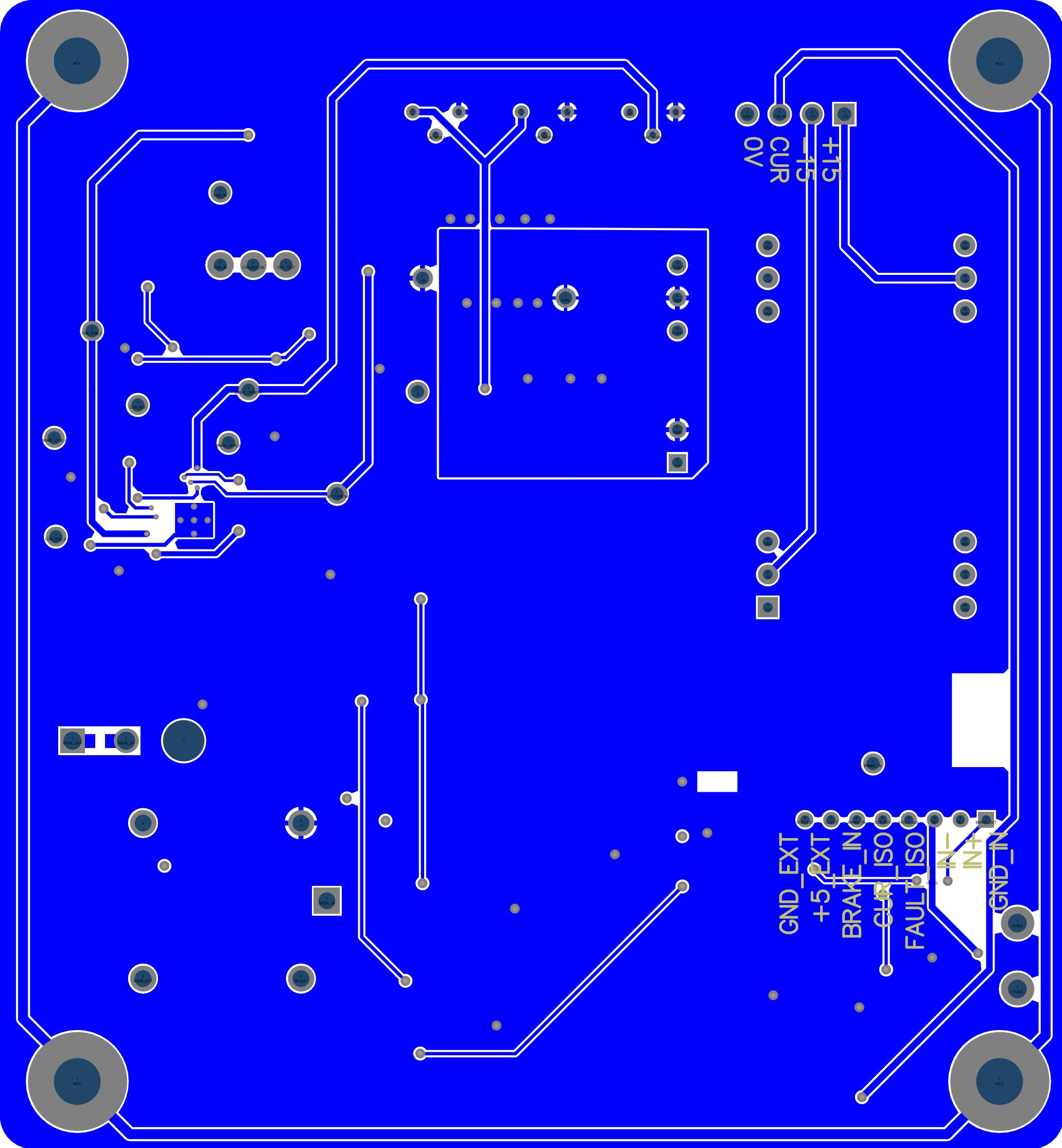
F Realistic View



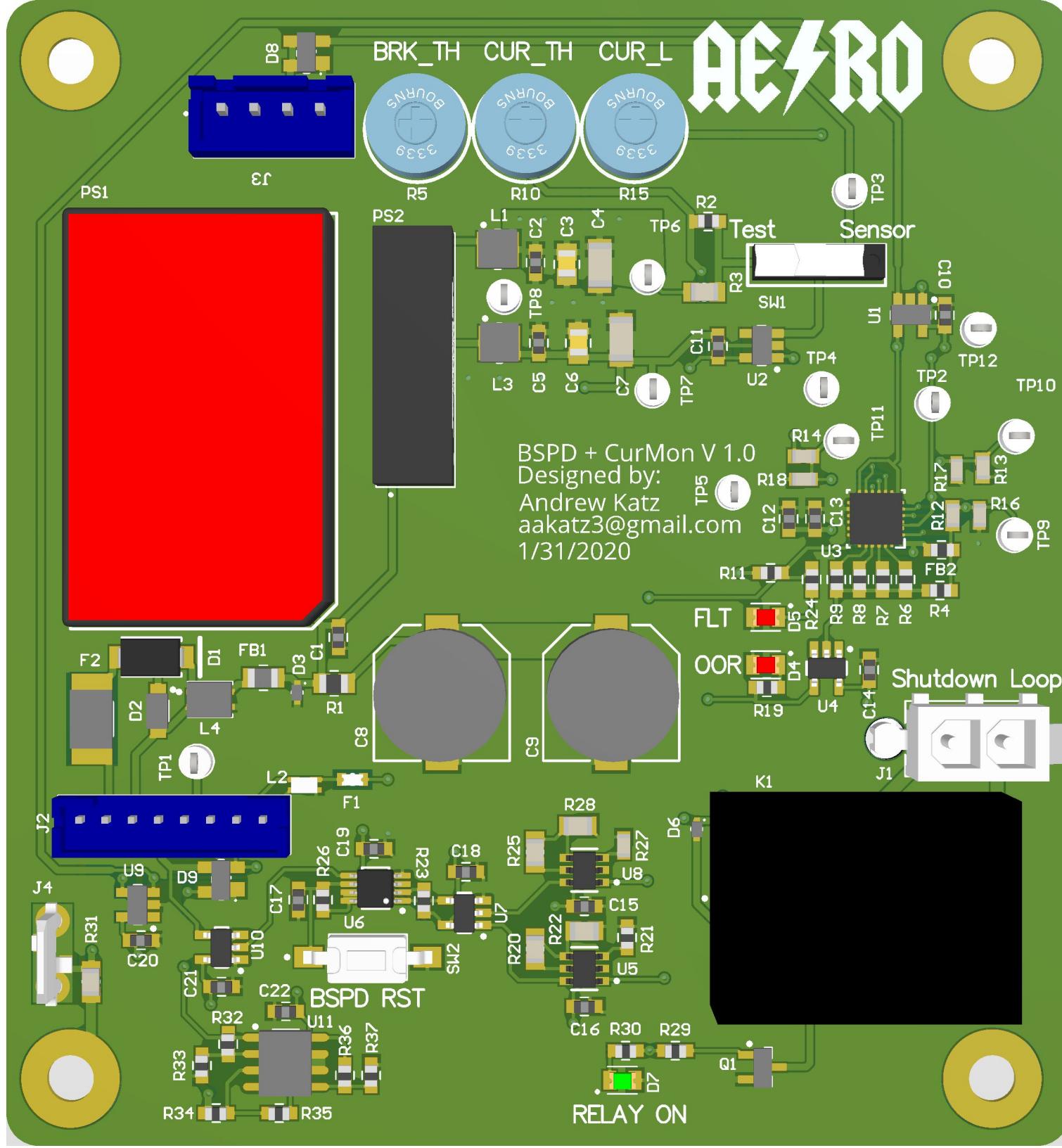
AC/DC

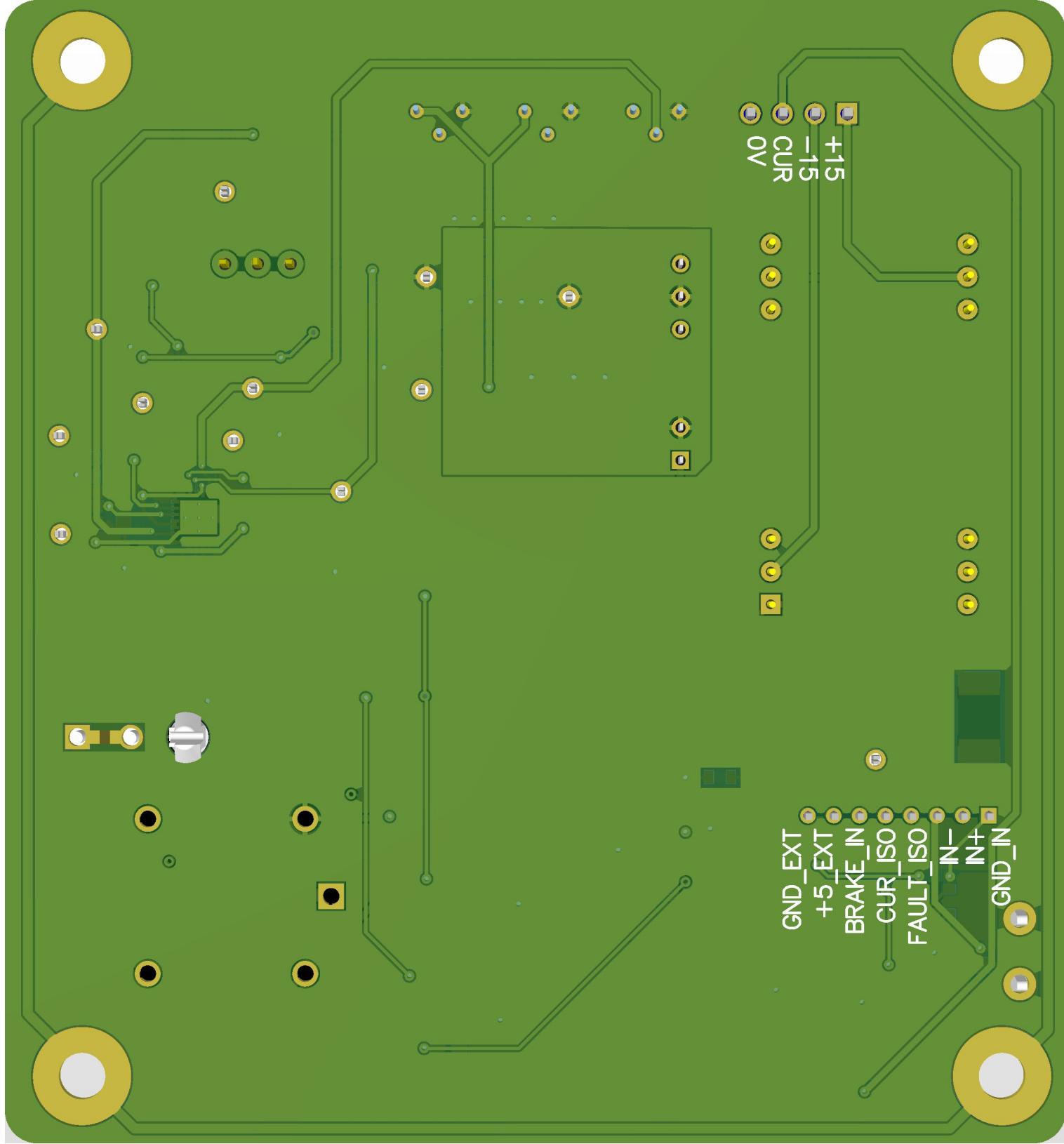
BRK TH CUR TH CUR L

BSPD + CurMon V 1.0
Designed by: Andrew Katz (akatz3@gmail.com)
TP5
1/31/2020



ACERO





Line #	Designator	Quantity	Manufacturer 1	Manufacturer Part Number 1	Supplier 1	Supplier Part Number 1
1	C1, C13, C15, C16	4	Murata	GRM188R61E106MA73J	Mouser	81-GRM188R61E106MA3J
2	C2, C5	2	TDK	C1608X5R1H105K080AB	Digi-Key	445-7468-6-ND
3	C3, C6	2	TDK	C2012X7R1V475K125AC	Mouser	810-C2012X7R1V475KAC
4	C4, C7	2	KEMET	C1206C476M8PACTU	Digi-Key	399-5508-1-ND
5	C8, C9	2	Nichicon	UUD1V331MNL1GS	Digi-Key	493-2293-1-ND
6	C10, C11, C12, C14, C18, C19, C20, C21, C22	9	Kyocera AVX	0603YC104KAT2A	Mouser	581-060316C104K
7	C17	1	Kyocera AVX	ML03511R0BAT2A	Mouser	581-ML03511R0BAT2A
8	D1	1	Diodes	B340A-13-F	Digi-Key	B340A-FDIDKR-ND
9	D2	1	ON Semiconductor	SZMMSZ5243BT1G	Digi-Key	SZMMSZ5243BT1GOSDKR-ND
10	D3	1	ON Semiconductor	ESD5Z12T1G	Digi-Key	ESD5Z12T1GOSCT-ND
11	D4, D5	2	Bivar	SM0805HCL	Digi-Key	492-2281-1-ND
12	D6	1	ON Semiconductor	NSR0340V2T1G	Digi-Key	NSR0340V2T1GOSCT-ND
13	D7	1	Bivar	SM0805GCL	Digi-Key	492-2525-1-ND
14	D8, D9	2	Littelfuse	SP0503BAHTG	Digi-Key	F2715CT-ND
15	F1	1	Bourns	MF-FSMF010X-2	Digi-Key	MF-FSMF010X-2CT-ND
16	F2	1	Littelfuse	1812L050/30PR	Digi-Key	F4159CT-ND
17	FB1	1	Wurth Electronics	742792097	Digi-Key	732-4649-6-ND
18	FB2	1	TDK	MMZ1608S121ATA00	Digi-Key	445-2173-6-ND
19	J1	1	TE Connectivity	1-770872-0	Digi-Key	A32449-ND
20	J2	1	JST	B8B-PH-K-S(LF)(SN)	Digi-Key	455-1710-ND
21	J3	1	JST	B4B-XH-AM(LF)(SN)	Digi-Key	455-2237-ND
22	J4	1	AMP - TE CONNECTIVITY	1217861-1	Digi-Key	A100452CT-ND
23	JP1	1	JST	A08KR08KR26E152B	Digi-Key	455-3153-ND
24	K1	1	Omron	G5LE-1-DC5	Digi-Key	Z1014-ND
25	L1, L3	2	Bourns	SRN3015-220M	Digi-Key	SRN3015-220MCT-ND
26	L2	1	Wurth Electronics	744231261	Digi-Key	732-1467-6-ND
27	L4	1	TDK	ACP3225-102-2P-T000	Digi-Key	445-8637-1-ND
28	P1	1	AMP - TE CONNECTIVITY	172165-1	Digi-Key	A25587-ND
29	P2	1	JST	PHR-4	Digi-Key	455-1164-ND
30	P3	1	TE Connectivity	2-520183-2	Digi-Key	A27817CT-ND
31	PIN1, PIN2, PIN4, PIN6	4	JST	SXH-001T-P0.6	Digi-Key	455-1135-1-ND
32	PIN3, PIN5	2	TE Connectivity	770904-1	Digi-Key	A25684CT-ND
34	PS2	1	Murata	NMK1205SC	Digi-Key	811-3393-5-ND
35	Q1	1	Nexperia	BSH105,215	Mouser	771-BSH105215
36	R1	1	Panasonic	ERJ-6ENF2001V	Mouser	667-ERJ-6ENF2001V
37	R2	1	Panasonic	ERJ-3EKF3303V	Mouser	667-ERJ-3EKF3303V
38	R3, R20, R25, R31	4	Yageo	RT0805BRE071ML	Digi-Key	YAG4967DKR-ND
39	R4, R11	2	Yageo	RC0603FR-0710KL	Mouser	603-RC0603FR-0710KL
40	R5, R10, R15	3	Bourns	3339H-1-103LF	Digi-Key	3339H-103LF-ND
41	R6, R7, R8, R9	4	Yageo	RC0603JR-070RL	Mouser	603-RC0603JR-070RL
42	R12, R14	2	Susumu	RR0816P-301-D	Digi-Key	RR08P300DCT-ND
43	R13	1	Susumu	RR0816P-183-D	Digi-Key	RR08P18.0KDCT-ND
44	R16, R18	2	Susumu	RR0816P-272-D	Digi-Key	RR08P2.7KDCT-ND
45	R17	1	Yageo	RT0603DRE072KL	Digi-Key	311-2525-1-ND
46	R19, R24, R30	3	Yageo	RC0603FR-07620RL	Digi-Key	311-620HRDKR-ND
47	R21	1	Panasonic	ERA-3AEBA992V	Digi-Key	P49.9KDBDKR-ND
48	R22, R28	2	Panasonic	ERA-6AEBA6813V	Digi-Key	P681KDAADKR-ND
49	R23, R29	2	Panasonic	ERJ-3EKF2000V	Mouser	667-ERJ-3EKF2000V
50	R26	1	Panasonic	ERJ3EKF4702V	Digi-Key	P47.0KHDKR-ND
51	R27	1	Susumu	RG1608P-9312-B-T5	Digi-Key	RG16P93.1KBDKR-ND
52	R32, R35	2	Vishay	TNPW060362K6BEEN	Mouser	71-TNPW060362K6BEEN
53	R33, R34, R36, R37	4	Panasonic	ERA-3AEBA104V	Digi-Key	P100KDBDKR-ND
54	SW1	1	Nidec Copal	CL-SA-12C-02	Digi-Key	563-1388-ND
55	SW2	1	TE Connectivity	FSMSMTR	Digi-Key	450-1758-6-ND
56	TP1, TP2, TP3, TP4, TP5, TP9, TP10, TP11, TP12	9	Permbond	5002	Digi-Key	36-5002-ND
57	TP6	1	Keystone Electronics	5000	Digi-Key	36-5000-ND
58	TP7	1	Keystone Electronics	5001	Digi-Key	36-5001-ND
59	TP8	1	Keystone Electronics	5116	Digi-Key	36-5116-ND
60	U1, U2, U9	3	ON Semiconductor	NCS2003SN2T1G	Digi-Key	NCS2003SN2T1GOSDKR-ND
61	U3	1	TI National Semiconductor	LMV7231SQE/NOPB	Digi-Key	LMV7231SQE/NOPBCT-ND
62	U4	1	Texas Instruments	SN74LVC1G04DBVR	Digi-Key	296-11599-1-ND
63	U5, U8	2	Analog Devices / Linear Technology	LTC6994CS6-1#TRMPBF	Digi-Key	LTC6994CS6-1#TRMPBFCT-ND
64	U6	1	Texas Instruments	SN74LVC2G74DCTR	Digi-Key	296-13273-1-ND
65	U7	1	Texas Instruments	SN74AHCT1G32DBVR	Digi-Key	296-1115-1-ND
66	U10	1	Texas Instruments	SN74LV1T125DBVR	Digi-Key	296-37172-6-ND
67	U11	1	Microchip	MCP6002T-I/SN	Digi-Key	MCP6002T-I/SNDKR-ND

Design Rules Verification Report

Filename : C:\Git\AERO_2019-2020\BSPD-2019-2020\UVM AERO BSPD.PcbDoc

Warnings 0
Rule Violations 0

Warnings	
Total	0
Rule Violations	
Clearance Constraint (Gap=6mil) (IsStitchingVia),((OnLayer('Top Overlay)))	0
Clearance Constraint (Gap=6mil) (All),(All)	0
Short-Circuit Constraint (Allowed=No) (All),(All)	0
Un-Routed Net Constraint (All)	0
Modified Polygon (Allow modified: No), (Allow shelved: No)	0
Width Constraint (Min=8mil) (Max=100mil) (Preferred=10mil) (All)	0
Width Constraint (Min=10mil) (Max=80mil) (Preferred=20mil) (InNetClass('PWR'))	0
Power Plane Connect Rule(Relief Connect)(Expansion=20mil) (Conductor Width=10mil) (Air Gap=10mil) (Entries=4)	0
Minimum Annular Ring (Minimum=3mil) (All)	0
Hole Size Constraint (Min=7.874mil) (Max=200mil) (All)	0
Pads and Vias to follow the Drill pairs settings	0
Hole To Hole Clearance (Gap=10mil) (All),(All)	0
Minimum Solder Mask Sliver (Gap=1mil) (All),(All)	0
Silk To Solder Mask (Clearance=1.8mil) (IsPad or IsVia),(All)	0
Silk to Silk (Clearance=10mil) (All),(All)	0
Net Antennae (Tolerance=0mil) (All)	0
Height Constraint (Min=0mil) (Max=1000mil) (Preferred=500mil) (All)	0
Total	0

Electrical Rules Check Report

Class	Document	Message
Warning	Current Scaler.SchDoc	Net 2.5_RDIV has no driving source (Pin R36-1, Pin R37-2, Pin U11-5)
Warning	Comparator.SchDoc	Net \OOR_FLT has no driving source (Pin R4-1, Pin R6-2, Pin R7-2, Pin R8-2, Pin R9-2, Pin U4-2)
Warning	LatchDelay.SchDoc	Net \RST has no driving source (Pin C17-1, Pin R26-2, Pin SW2-1, Pin U6-6)
Warning	TOP.SchDoc	Net BRAKE_IN has no driving source (Pin D9-2, Pin J2-6, Pin TP1-1, Pin U1-3, Pin U9-3)
Warning	Comparator.SchDoc	Net BRAKE_OOR_H has no driving source (Pin R14-1, Pin R18-2, Pin TP11-1, Pin U3-8)
Warning	Comparator.SchDoc	Net BRAKE_OOR_L has no driving source (Pin R13-1, Pin R17-2, Pin TP10-1, Pin U3-5)
Warning	Comparator.SchDoc	Net BRAKE_THRESH has no driving source (Pin R5-2, Pin TP4-1, Pin U3-11)
Warning	Comparator.SchDoc	Net CUR_BUF_IN has no driving source (Pin SW1-2, Pin U2-3)
Warning	Comparator.SchDoc	Net CUR_OOR_H has no driving source (Pin R12-1, Pin R16-2, Pin TP9-1, Pin U3-4)
Warning	Comparator.SchDoc	Net CUR_OOR_L has no driving source (Pin R15-2, Pin TP12-1, Pin U3-1)
Warning	Comparator.SchDoc	Net CUR_THRESH has no driving source (Pin R2-1, Pin R10-2, Pin TP5-1, Pin U3-9)
Warning	LatchDelay.SchDoc	Net FAULT_EN has no driving source (Pin R23-1, Pin U6-2)
Warning	LatchDelay.SchDoc	Net FAULT_TIM has no driving source (Pin U7-2, Pin U8-6)
Warning	LatchDelay.SchDoc	Net OOR_TIM has no driving source (Pin U5-6, Pin U7-1)
Warning	Current Scaler.SchDoc	Net VN has no driving source (Pin R32-2, Pin R33-2, Pin U11-2)
Warning	Current Scaler.SchDoc	Net VP has no driving source (Pin R34-2, Pin R35-2, Pin U11-3)
Warning	TOP.SchDoc	Nets Wire BSPD_FLT has multiple names (Net Label BSPD_FLT, Port BSPD_FLT, Port FAULT_IN, Sheet Entry U_Comparator-BSPD_FLT(Output), Sheet Entry U_LatchDelay-FAULT_IN(Input))
Warning	TOP.SchDoc	Nets Wire BSPD_OK has multiple names (Net Label BSPD_OK, Port BSPD_OK, Port RELAY_EN, Sheet Entry U_LatchDelay-BSPD_OK(Output), Sheet Entry U_Relay-RELAY_EN(Input))
Warning	TOP.SchDoc	Nets Wire OOR_FLT has multiple names (Net Label OOR_FLT, Port OOR_FLT, Port OUT_OF_RANGE, Sheet Entry U_Comparator-OOR_FLT(Output), Sheet Entry U_LatchDelay-OUT_OF_RANGE(Input))