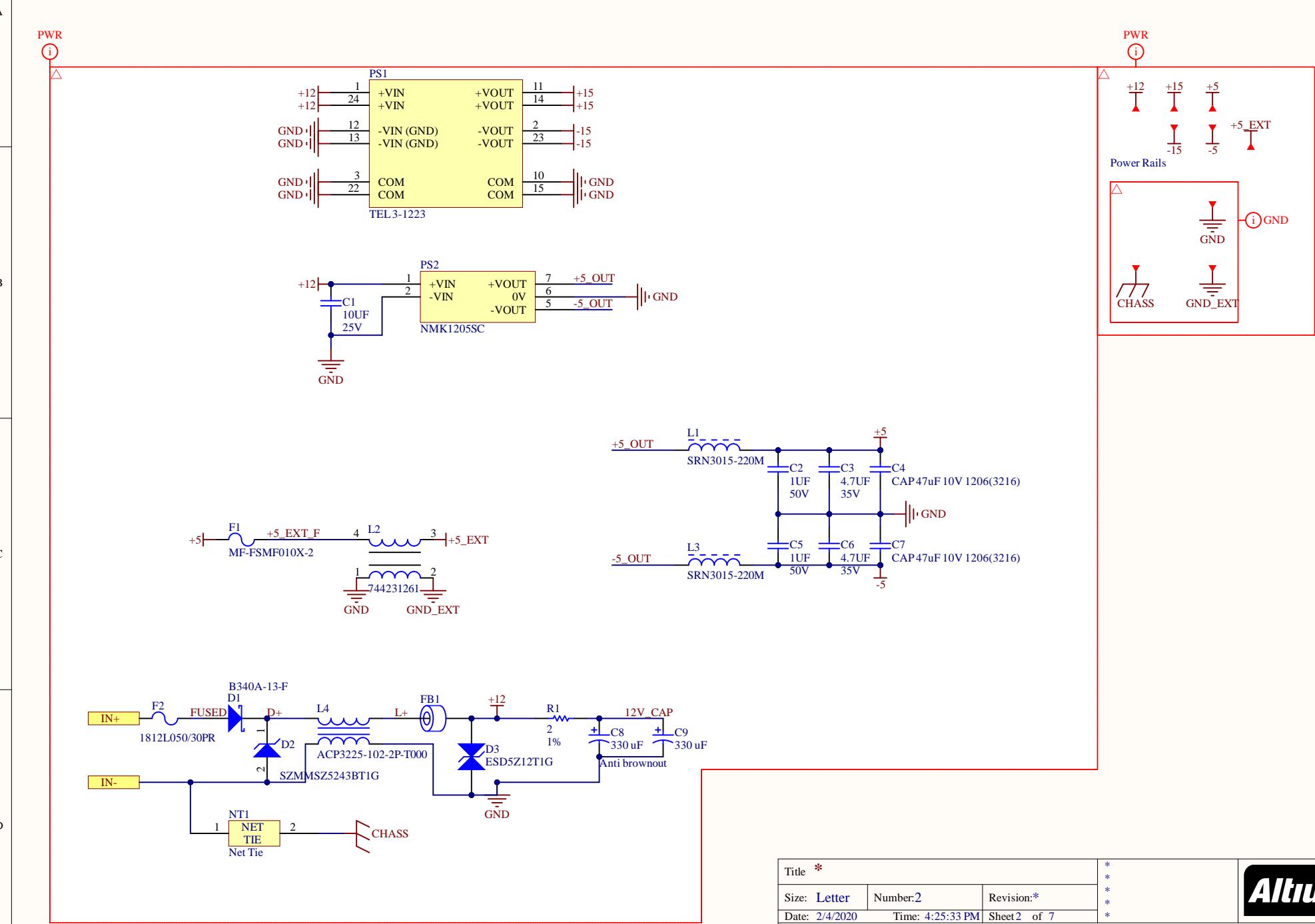
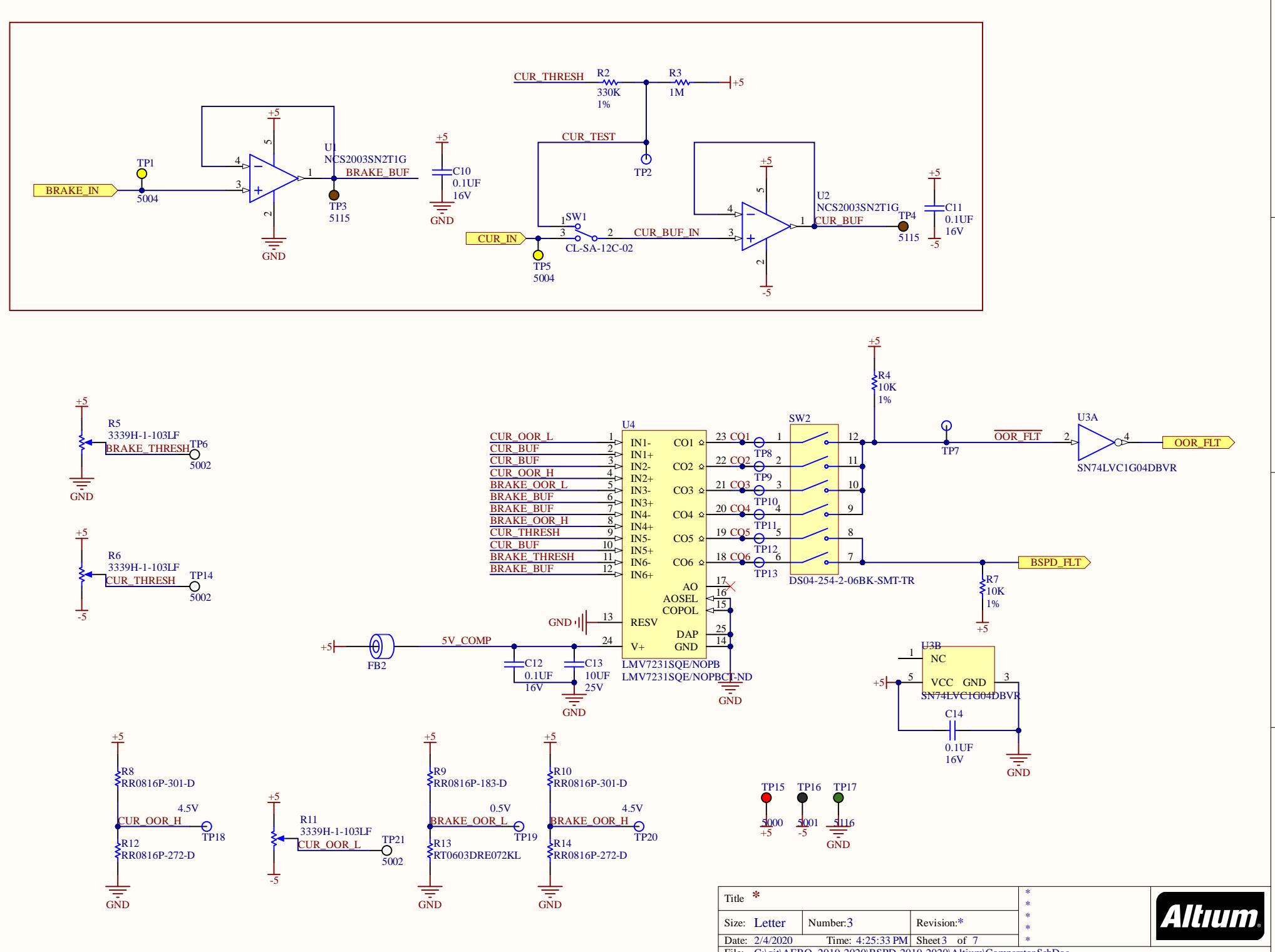


Current Sensor P/N: HAS 400-S

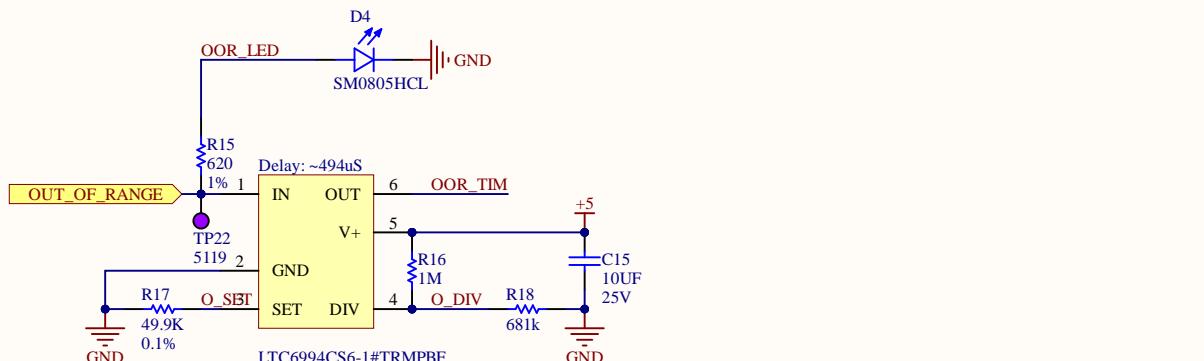
Brake Sensor P/N: MLH02KPSB06A

Title *			*
Size: Letter	Number: 1	Revision: A01	*
Date: 2/4/2020	Time: 4:25:33 PM	Sheet 1 of 7	*
File: C:\git\AERO_2019-2020\BSPD-2019-2020\Altium\TOPSchDoc			Altium®

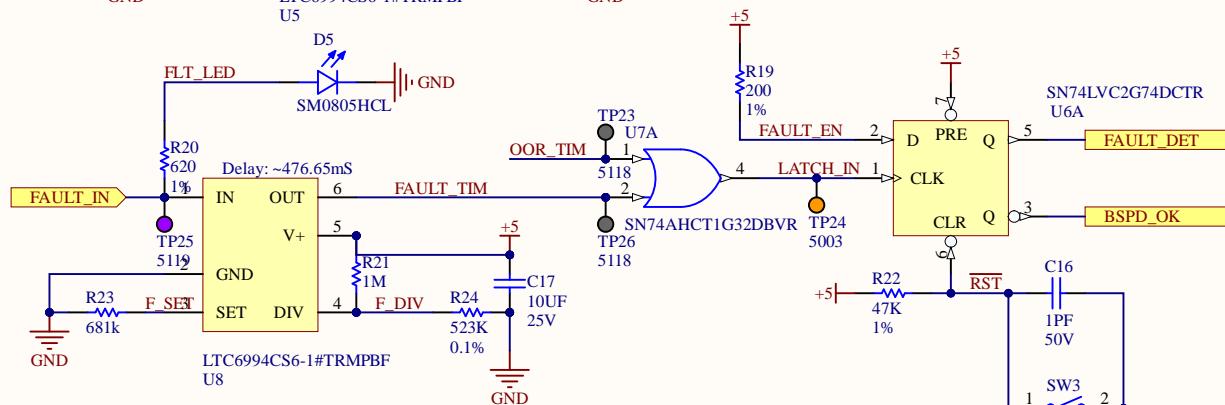




A

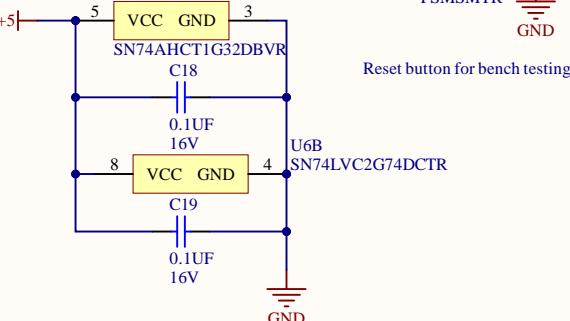


B



C

See SIMS\LatchDelay



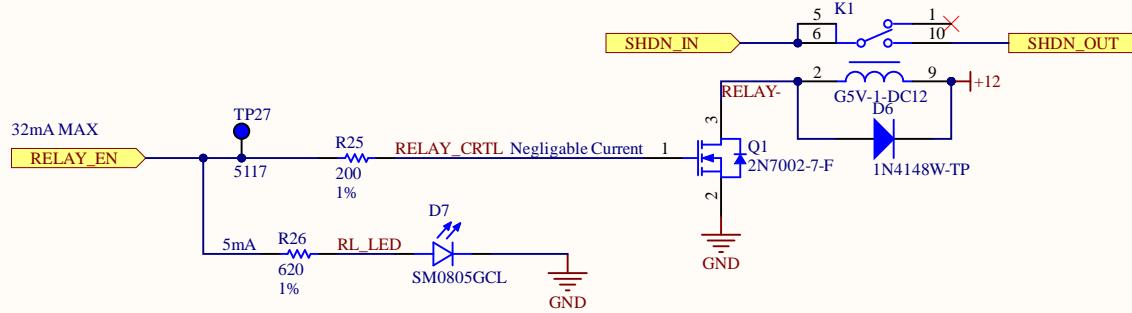
D

A

A

B

B



C

C

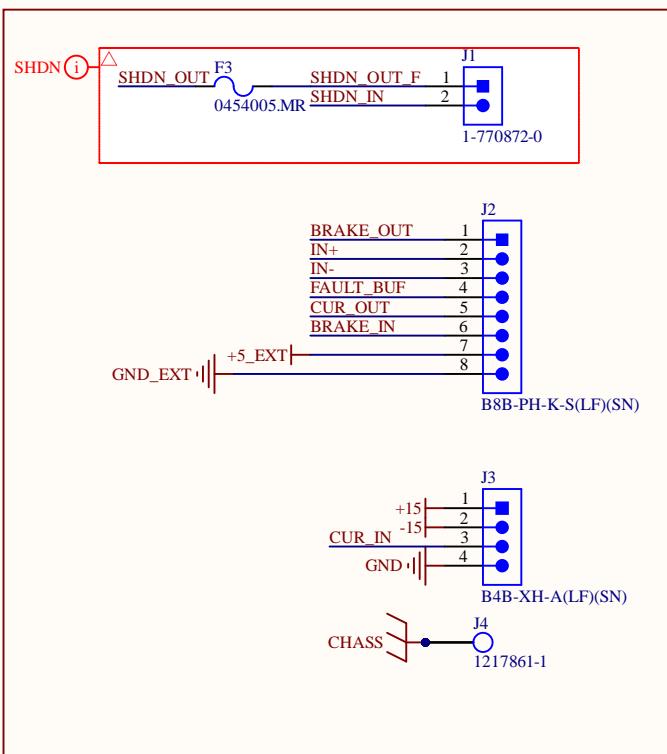
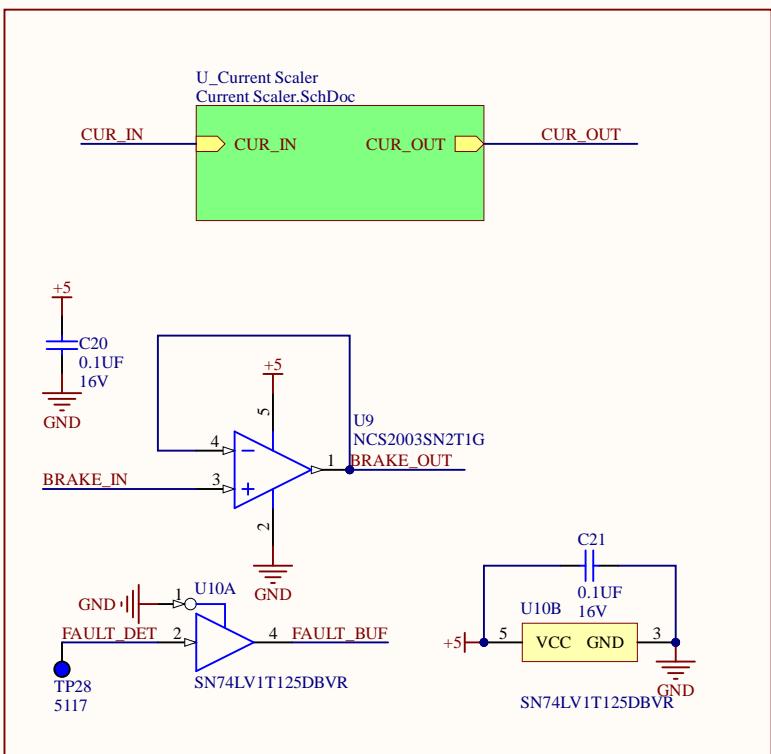
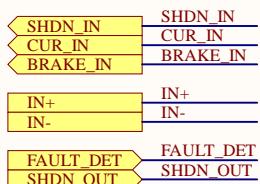
D

D

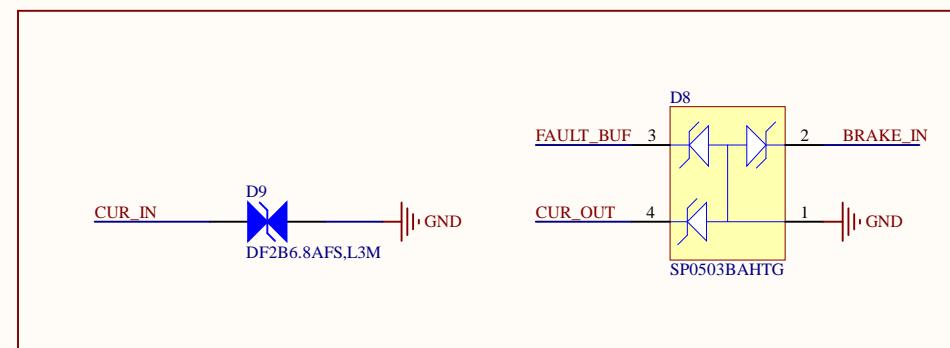
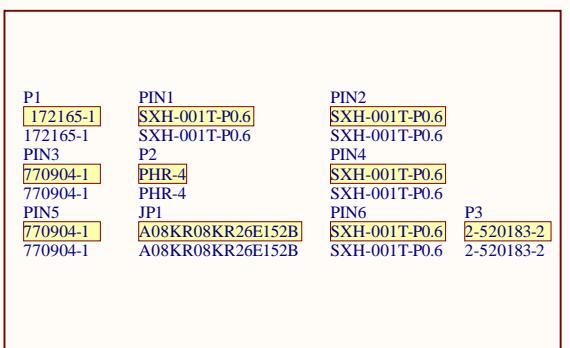
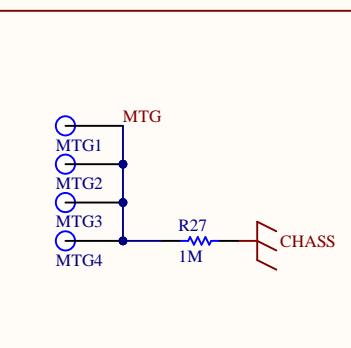
Title *			*
Size:	Letter	Number: 5	Revision: *
Date:	2/4/2020	Time: 4:25:33 PM	Sheet 5 of 7
File:	C:\git\AERO_2019-2020\BSPD-2019-2020\Altium\Relay.SchDoc		



A



B



C

Title		
Size	Number	Revision
Letter		
Date:	2/04/2020	Sheet of
File:	C:\git\..\IO and Connectors.SchDoc	Drawn By:

A

A

B

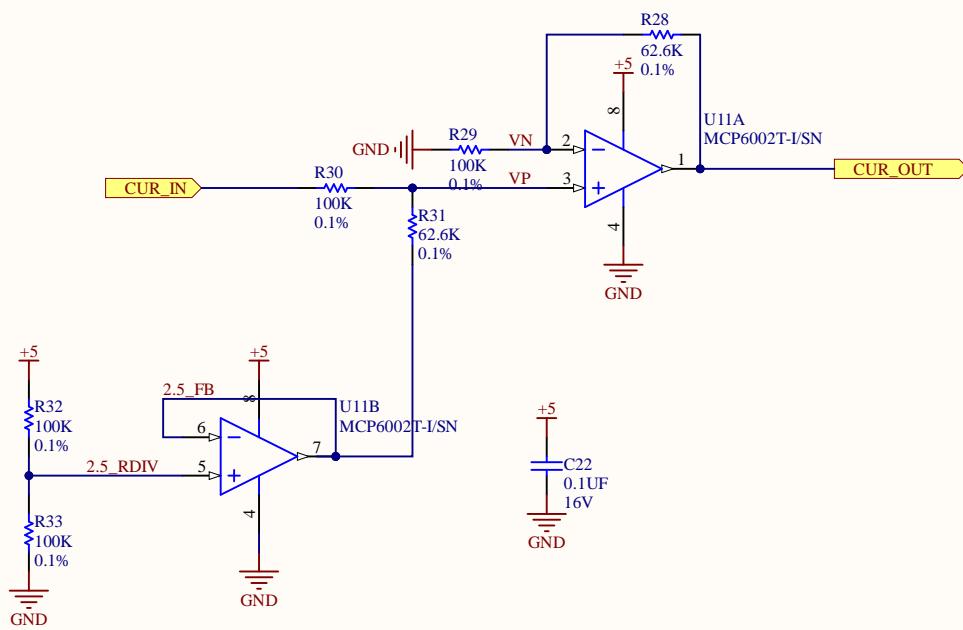
B

C

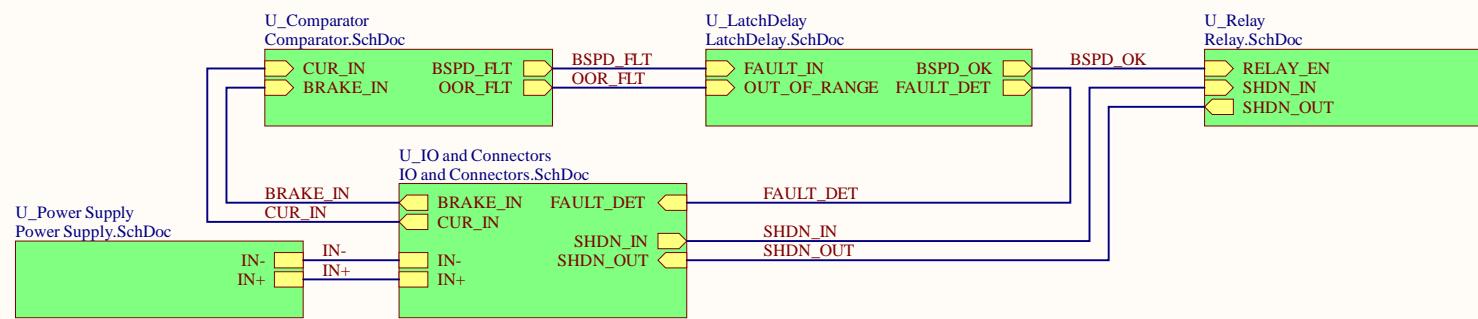
C

D

D



Title *			*
Size: Letter	Number: 7	Revision: *	*
Date: 2/4/2020	Time: 4:25:33 PM	Sheet 7 of 7	*
File: C:\git\AERO_2019-2020\BSPD-2019-2020\Altium\Current Scaler.SchDoc			*

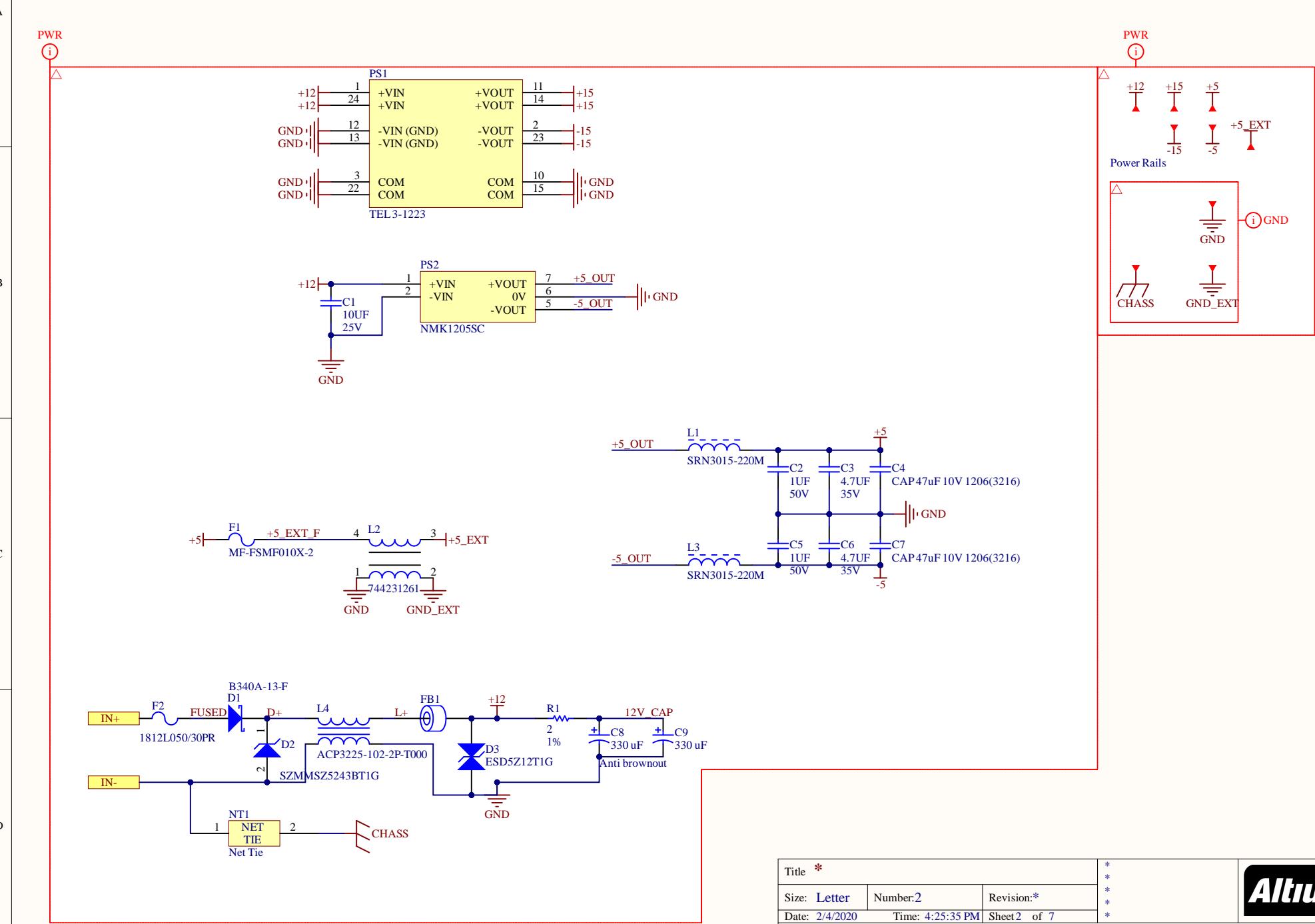


Current Sensor P/N: HAS 400-S

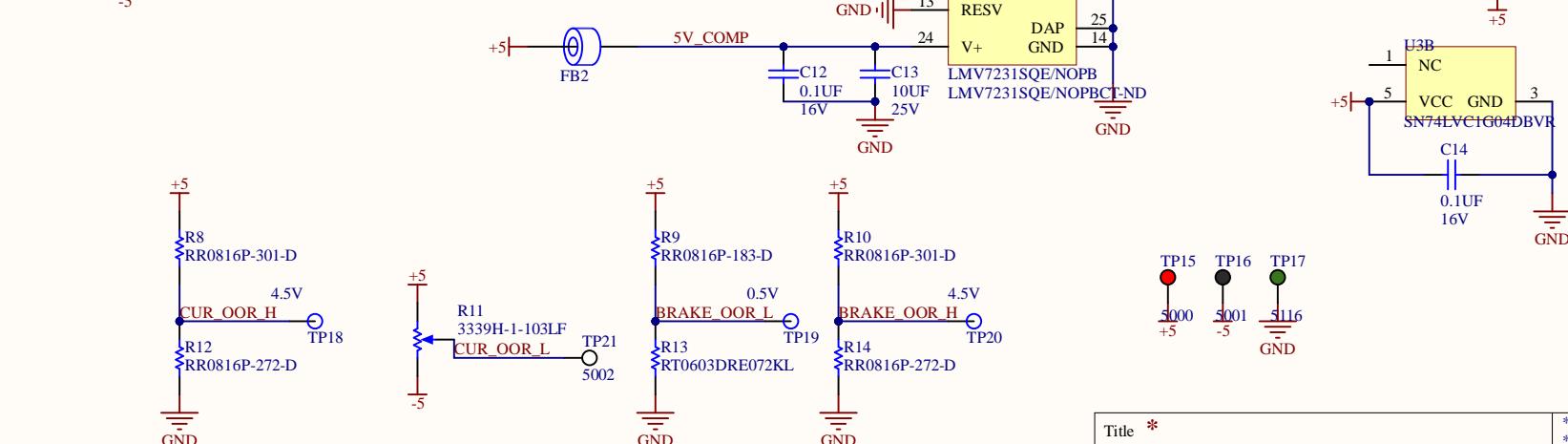
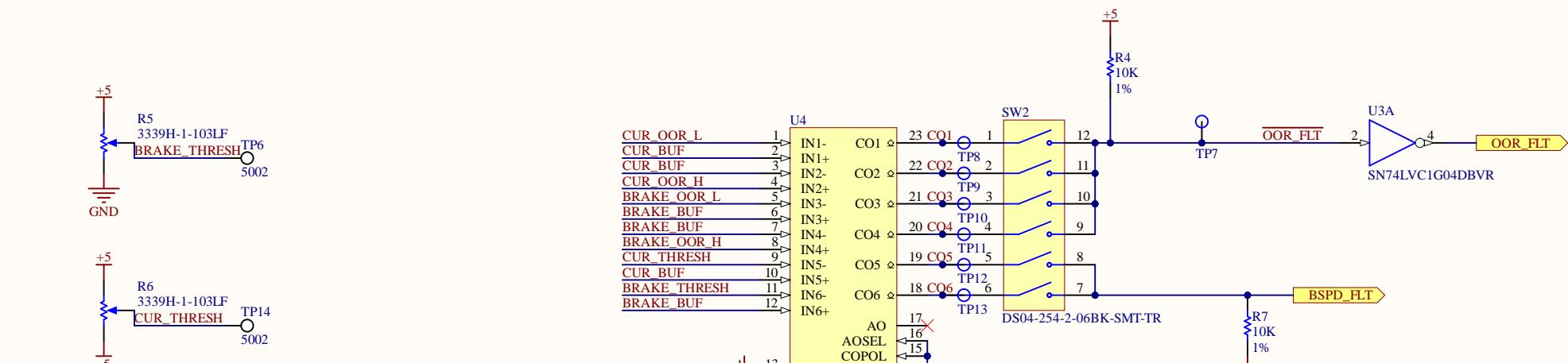
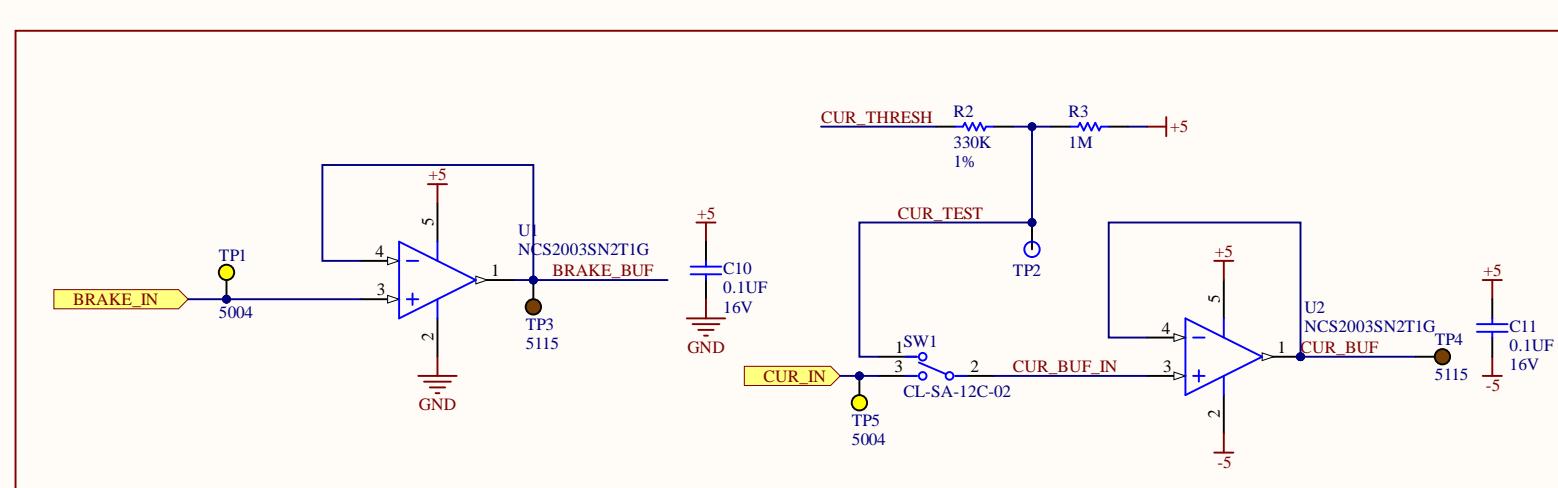
Brake Sensor P/N: MLH02KPSB06A

Title *		
Size: Letter	Number: 1	Revision: A01
Date: 2/4/2020	Time: 4:25:35 PM	Sheet 1 of 7
File: C:\git\AERO_2019-2020\BSPD-2019-2020\Altium\TOPSchDoc		

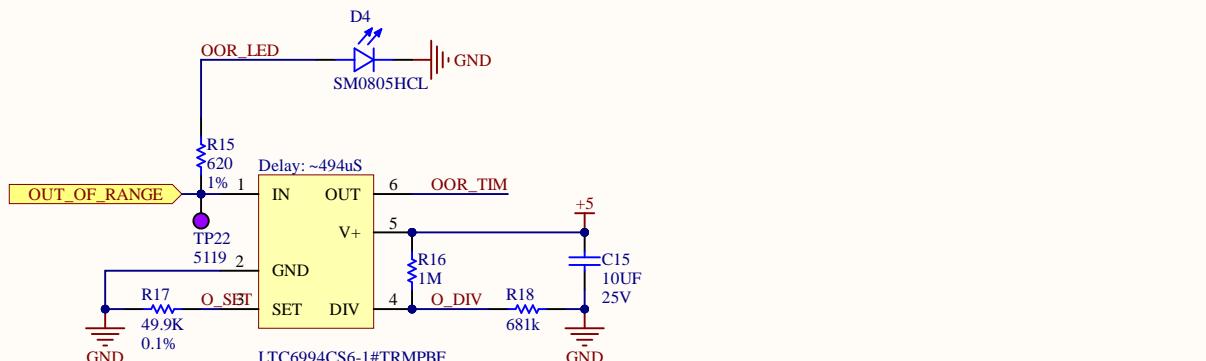




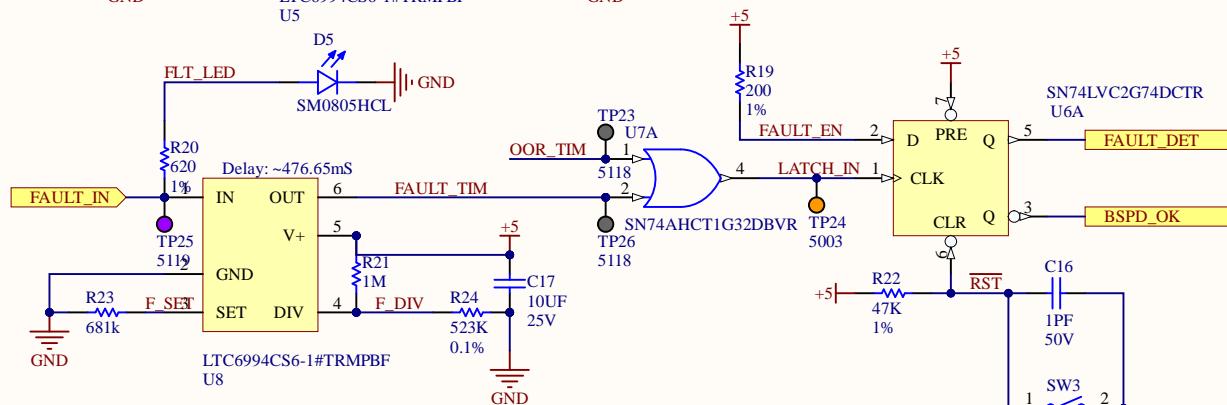
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Size: Letter	Number: 2	Revision: *
Date: 2/4/2020	Time: 4:25:35 PM	Sheet 2 of 7
File: C:\git\AERO_2019-2020\BSPD-2019-2020\Altium\Power Supply.SchDoc		



A

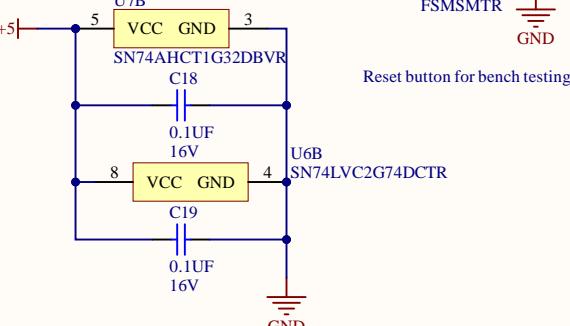


B



C

See SIMS\LatchDelay



D

Title *		
Size: Letter	Number: 4	Revision: *
Date: 2/4/2020	Time: 4:25:35 PM	Sheet 4 of 7
File: C:\git\AERO_2019-2020\BSPD-2019-2020\Altium\LatchDelay.SchDoc		

A

A

B

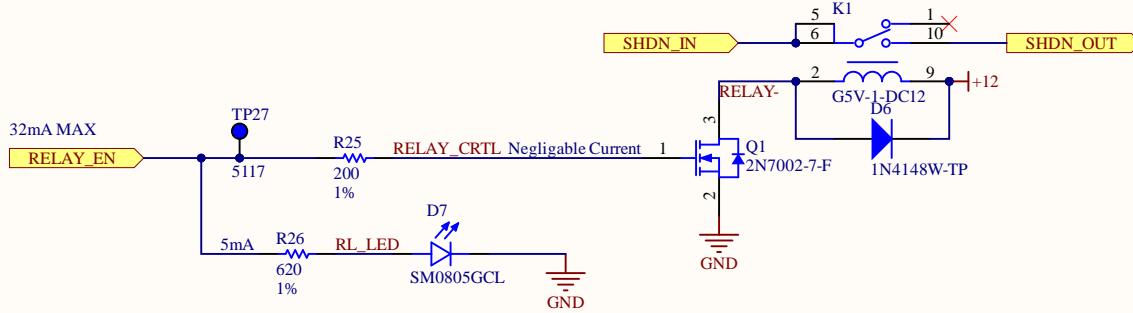
B

C

C

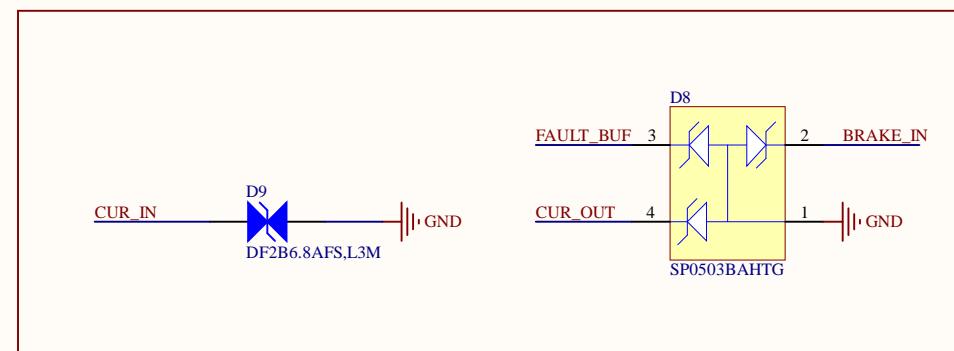
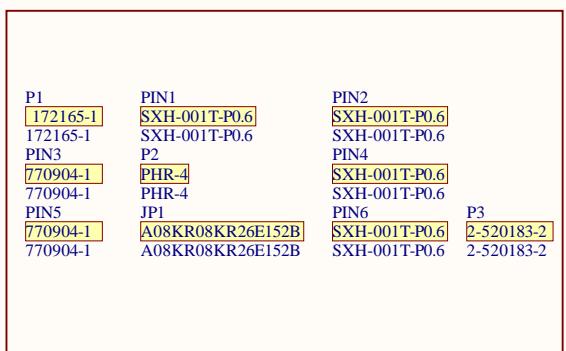
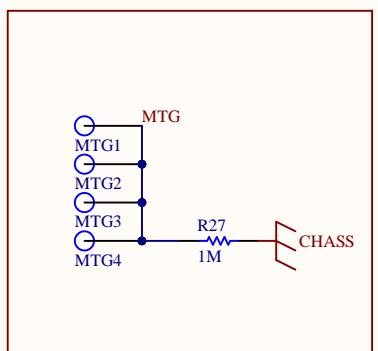
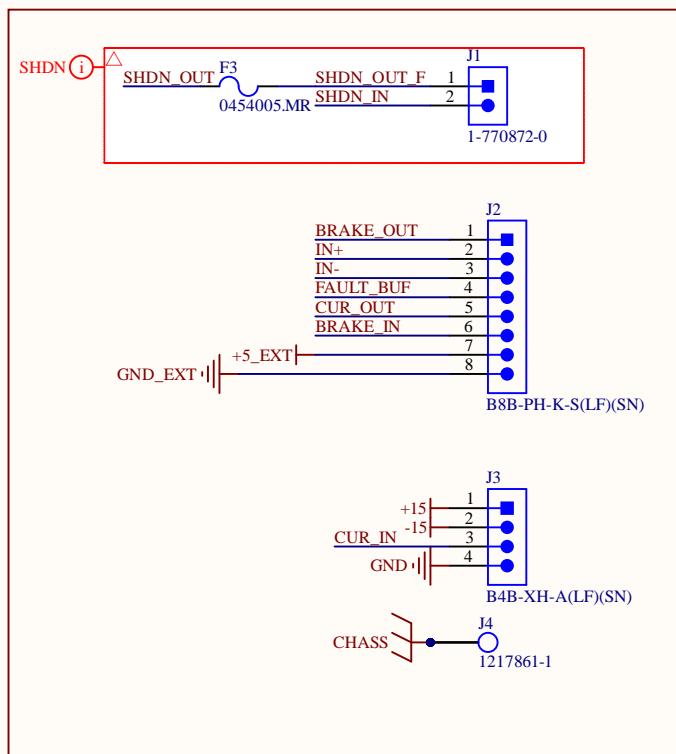
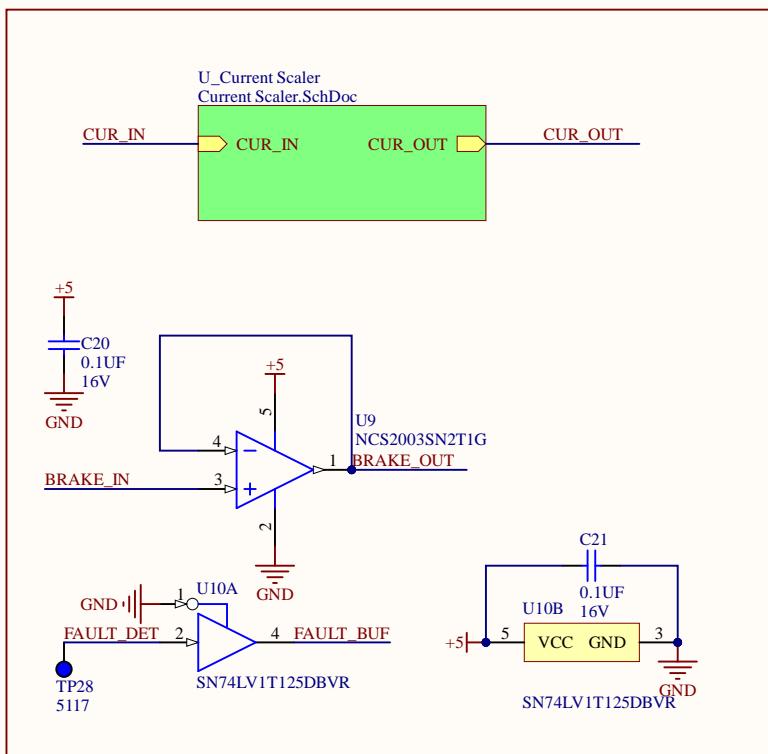
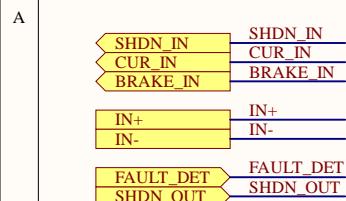
D

D



Title *		
Size: Letter	Number: 5	Revision: *
Date: 2/4/2020	Time: 4:25:35 PM	Sheet 5 of 7
File: C:\git\AERO_2019-2020\BSPD-2019-2020\Altium\Relay.SchDoc		





D

Title		
Size	Number	Revision
Letter		
Date:	2/04/2020	Sheet of
File:	C:\git\..\IO and Connectors.SchDoc	Drawn By:

A

A

B

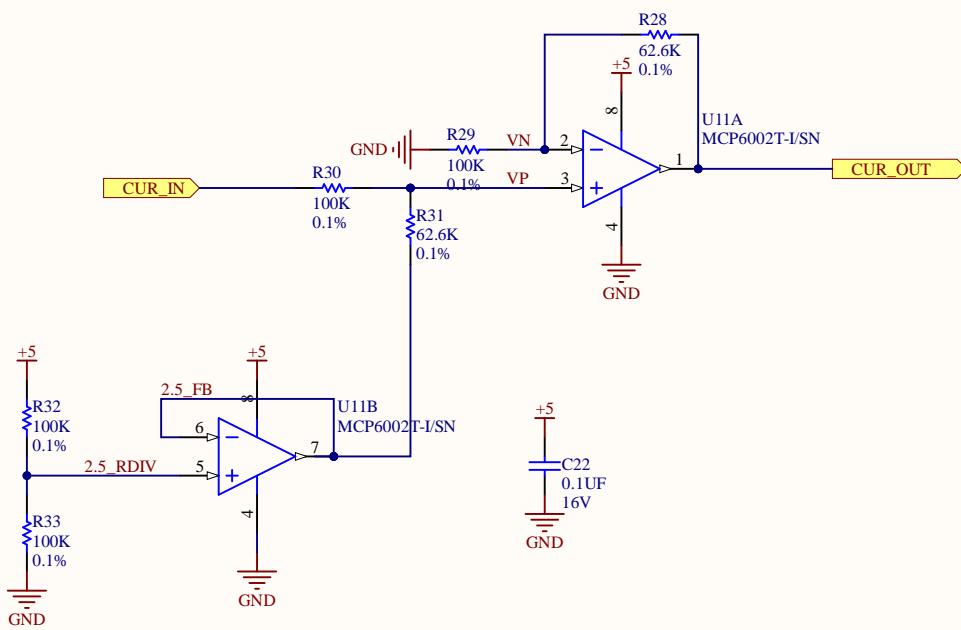
B

C

C

D

D



Title *			*
Size: Letter	Number: 7	Revision: *	*
Date: 2/4/2020	Time: 4:25:36 PM	Sheet 7 of 7	*
File: C:\git\AERO_2019-2020\BSPD-2019-2020\Altium\Current Scaler.SchDoc			*

A

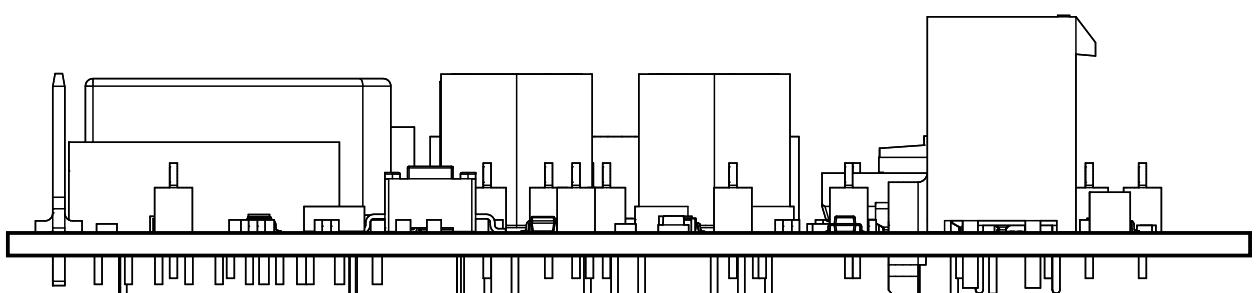
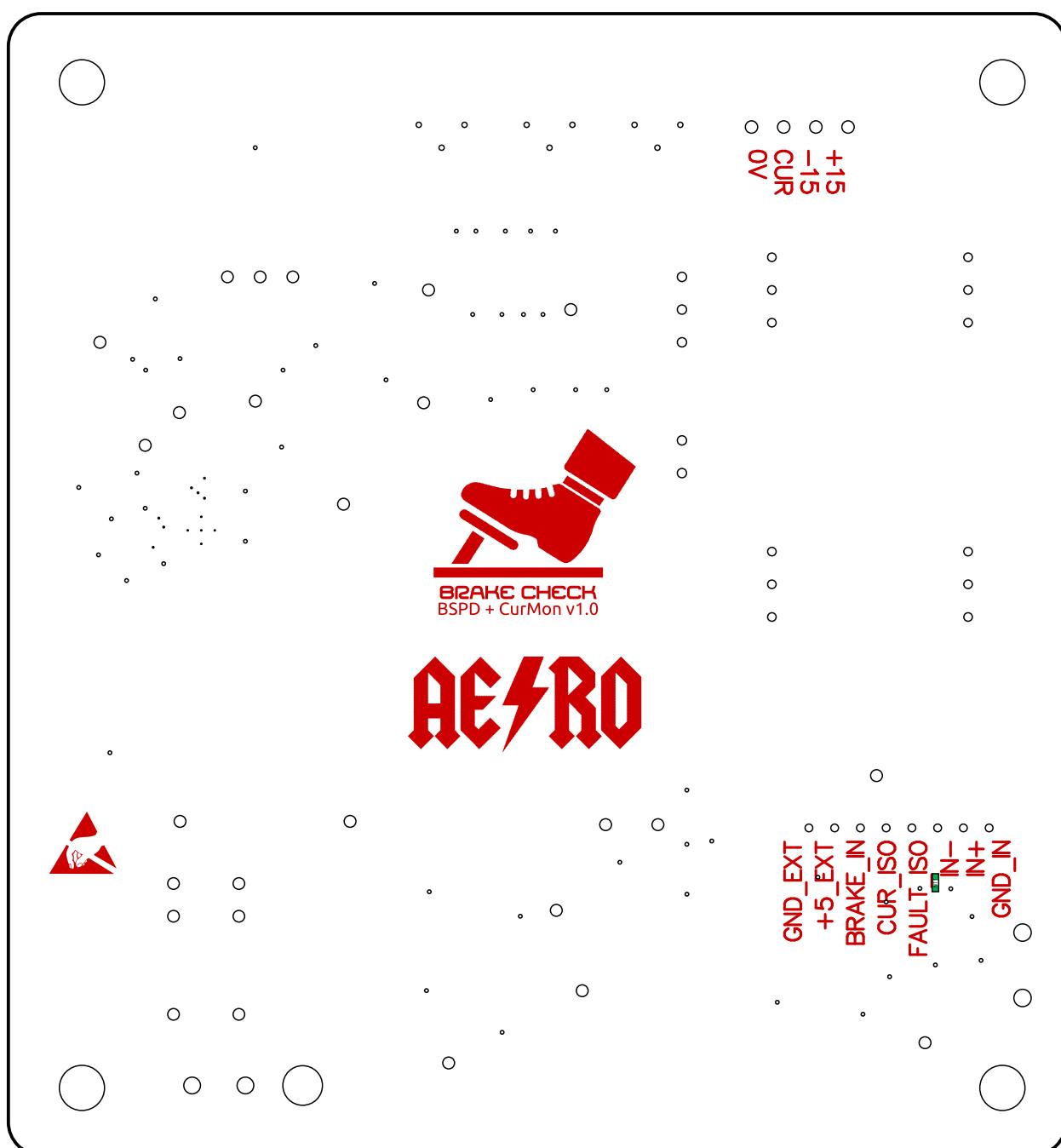
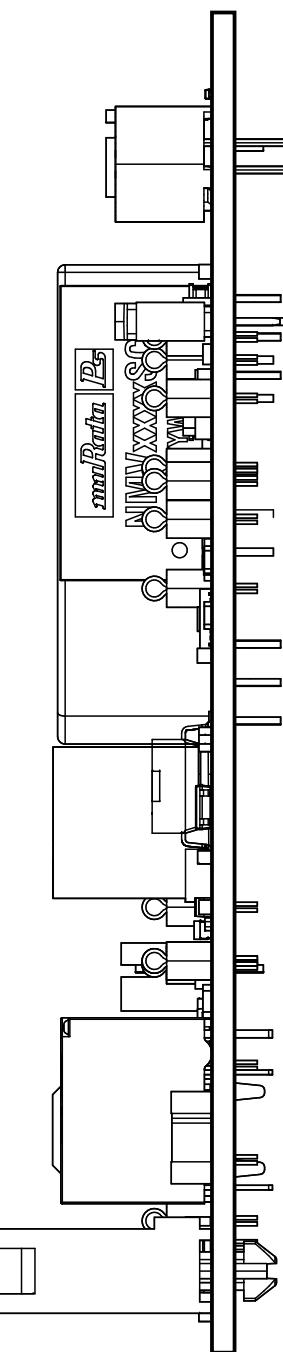
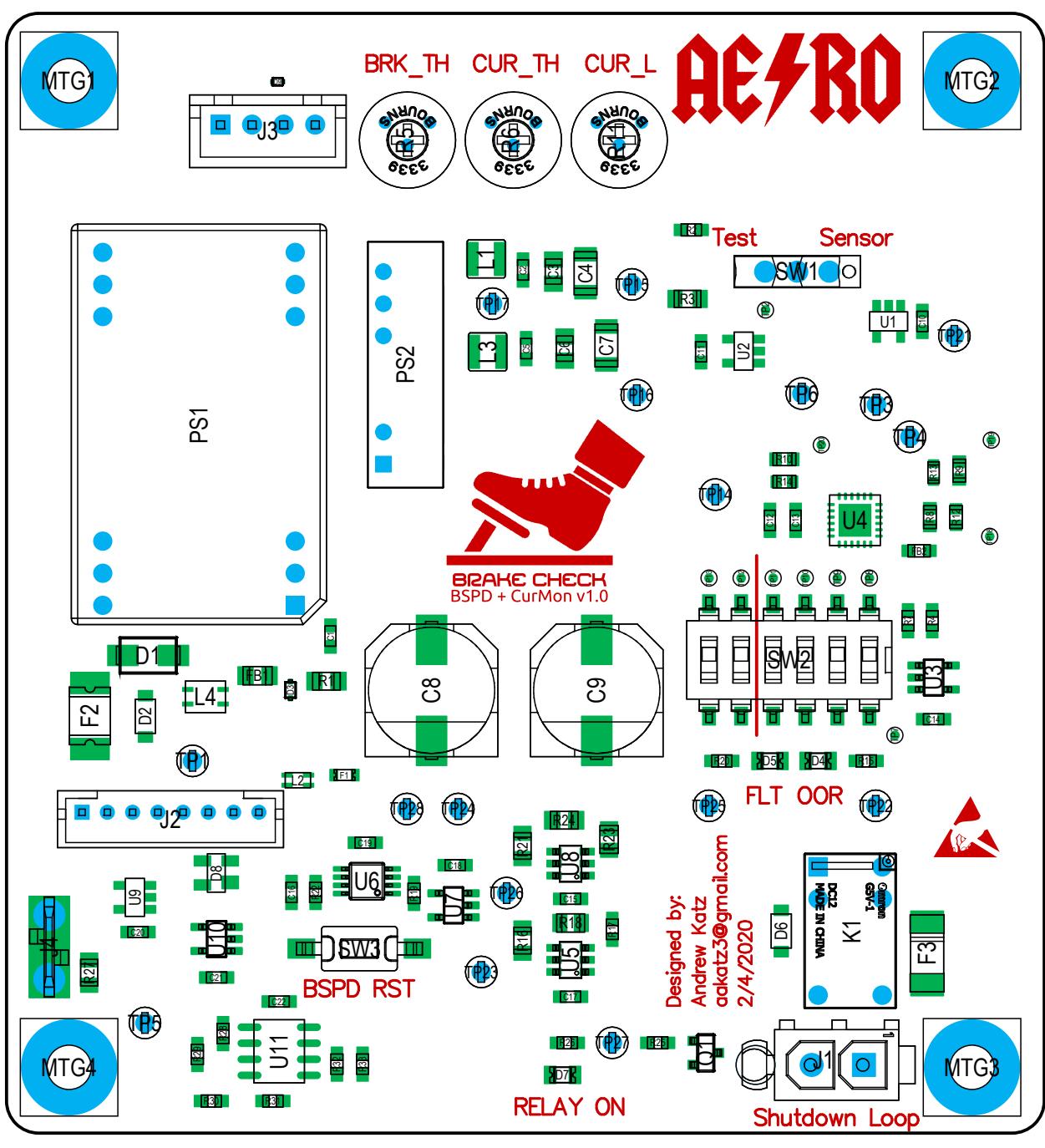
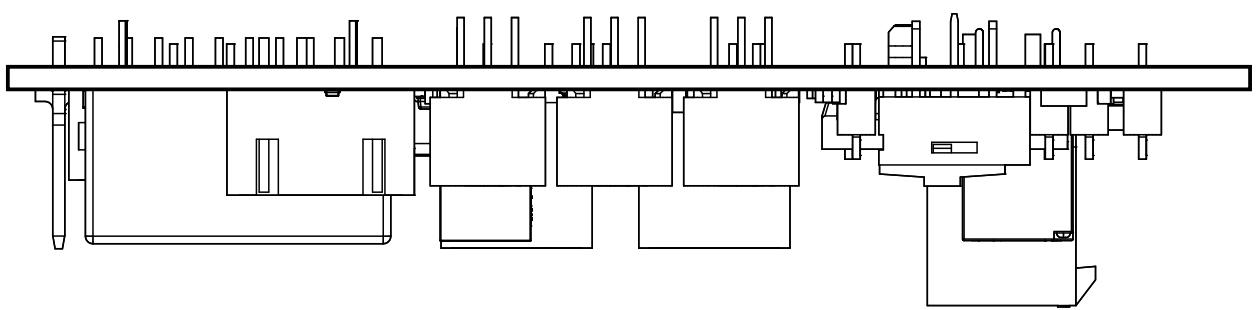
B

C

D

E

F



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WRITTEN PERMISSION OF IS
PROPRIETARY AND CONFIDENTIAL

		UNLESS OTHERWISE SPECIFIED:	NAME	DATE	TITLE
		DIMENSIONS ARE IN INCHES	DRAWN	2/4/2020	
		TOLERANCES:	CHECKED		
		FRACTIONAL±	ENG APPR.		
		ANGULAR: MACH± BEND ±	MFG APPR.		
		TWO PLACE DECIMAL ±	Q.A.		
		THREE PLACE DECIMAL ±	MATERIAL		
		INTERPRET GEOMETRIC TOLERANCING PER:	COMMENTS:		
		NEXT ASSY	USED ON		
		FINISH	APPLICATION	DO NOT SCALE DRAWING	
					SIZE DWG NO.
					SCALE: 1:1
					WEIGHT:
					SHEET 1 OF 1

A

B

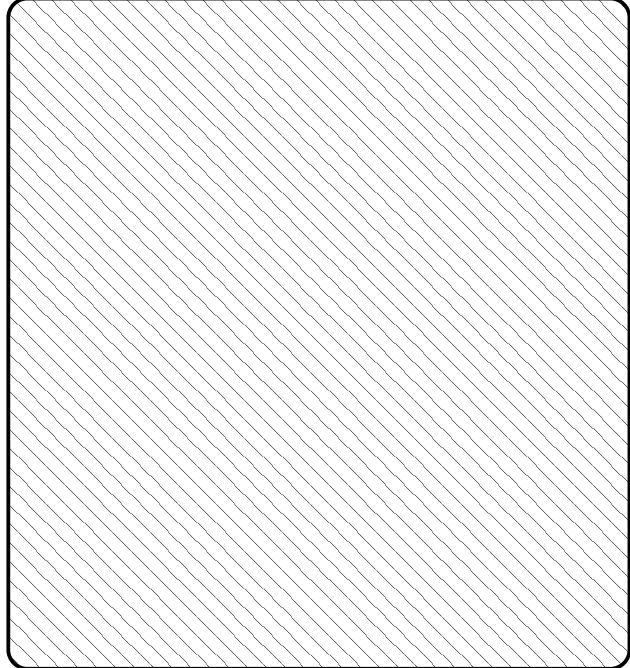
C

D

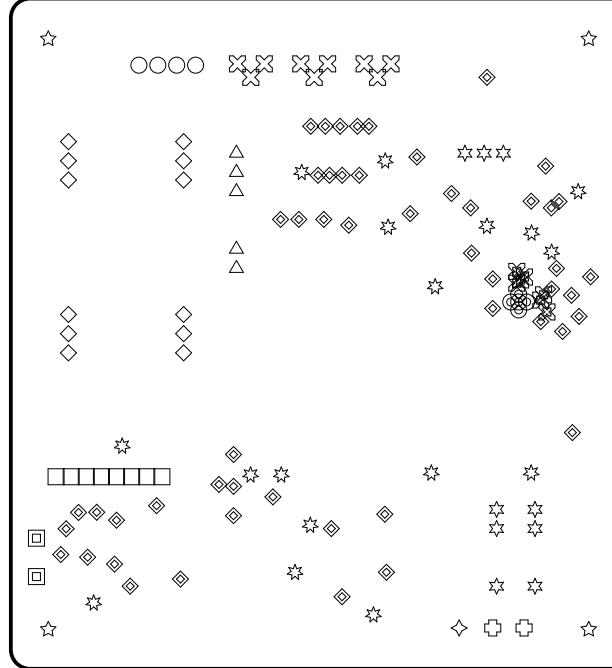
E

F

Region View (Scale 1:1)



Drill Drawing View (Scale 1:1)



Drill Table

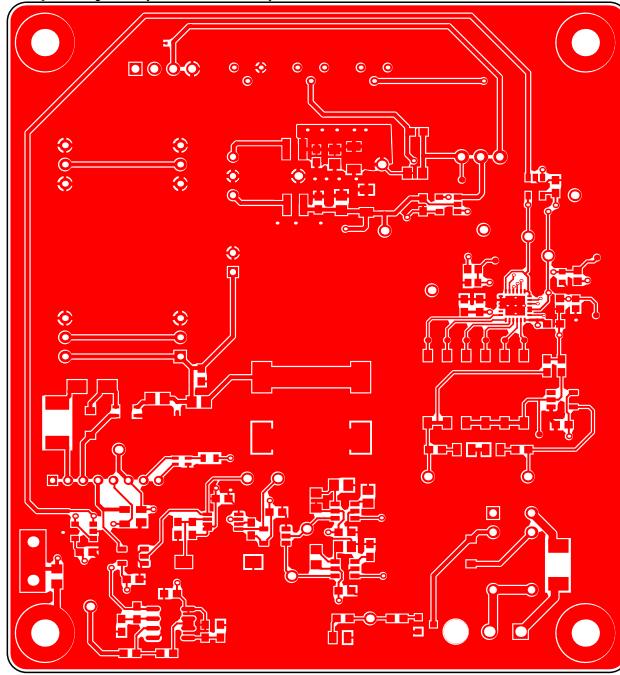
Symbol	Count	Hole Size	Plated
◎	5	7.87mil	Есть
☒	7	9.00mil	Есть
◇	52	15.00mil	Есть
✗	9	20.00mil	Есть
□	8	27.56mil	Есть
◇	12	30.00mil	Есть
△	5	32.28mil	Есть
☆	9	39.37mil	Есть
✿	17	40.00mil	Есть
○	4	41.73mil	Есть
✚	2	55.00mil	Есть
▣	2	57.00mil	Есть
◇	1	125.00mil	Нет
☆	4	142.00mil	Есть
137 Total			

Layer Stack Legend

Material	Layer	Thickness	Dielectric Material	Type	Gerber
	Top Overlay			Legend	GTO
Surface Material	Top Solder	1.00mil(0.02540mm)	SM-001	Solder Mask	GTS
PbSn	Top Surface Finish	0.79mil(0.01999mm)		Surface Finish	
Cu	Top Layer	1.40mil(0.03556mm)		Signal	GTL
Core		56.00mil(1.42240mm) FR-4		Dielectric	
Cu	Bottom Layer	1.40mil(0.03556mm)		Signal	GBL
PbSn	Bottom Surface Finish	0.79mil(0.01999mm)		Surface Finish	
Surface Material	Bottom Solder	1.00mil(0.02540mm)	SM-001	Solder Mask	GBS
	Bottom Overlay			Legend	GBO
Total thickness: 62.37mil(1.58430mm)					

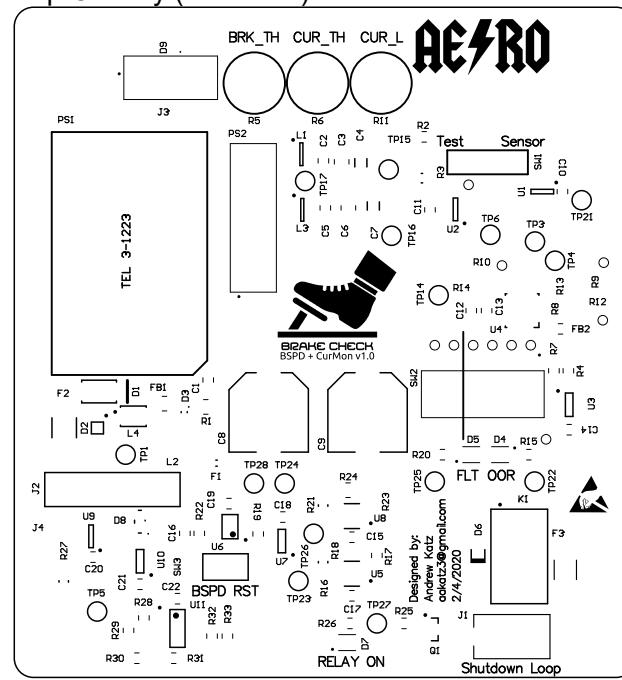
A

Top Layer (Scale 1:1)



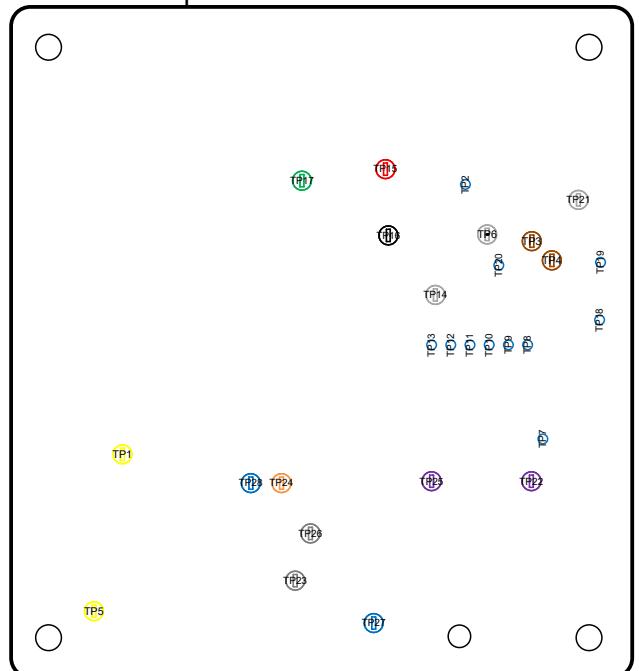
B

Top Overlay (Scale 1:1)



A B C D E

Test Point Map



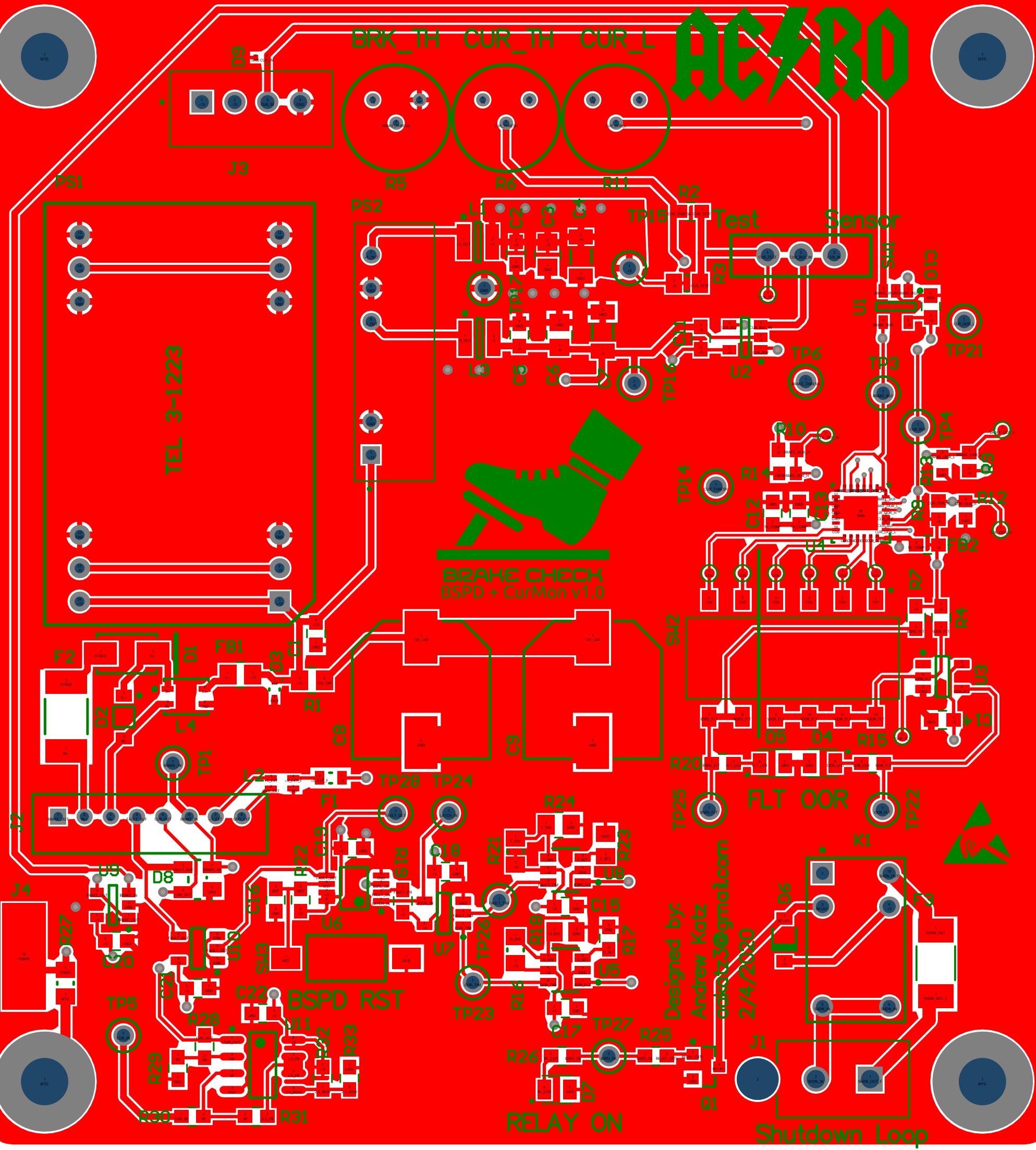
Bill Of Materials (Test Points)

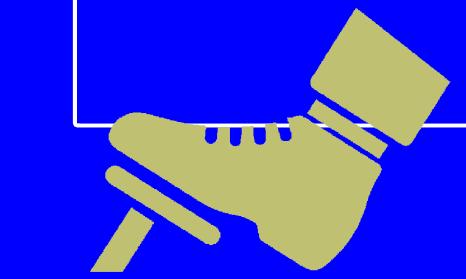
Line #	Designator	Name	Quantity	Color
7	TP15	5000	1	Red
8	TP16	5001	1	Black
9	TP6, TP14, TP21	5002	3	White
10	TP24	5003	1	Orange
11	TP1, TP5	5004	2	Yellow
12	TP3, TP4	5115	2	Brown
13	TP17	5116	1	Green
14	TP27, TP28	5117	2	Blue
15	TP23, TP26	5118	2	Grey
16	TP22, TP25	5119	2	Purple

Testpoint Reference

Testpoint	Net
TP1	BRAKE_IN
TP2	CUR_TEST
TP3	BRAKE_BUF
TP4	CUR_BUF
TP5	CUR_IN
TP6	BRAKE_THRESH
TP7	\OOR_FLT
TP8	CO1
TP9	CO2
TP10	CO3
TP11	CO4
TP12	CO5
TP13	CO6
TP14	CUR_THRESH
TP15	5
TP16	-5
TP17	GND
TP18	CUR_OOR_H
TP19	BRAKE_OOR_L
TP20	BRAKE_OOR_H
TP21	CUR_OOR_L
TP22	OOR_FLT
TP23	OOR_TIM
TP24	LATCH_IN
TP25	BSPD_FLT
TP26	FAULT_TIM
TP27	BSPD_OK
TP28	FAULT_DET

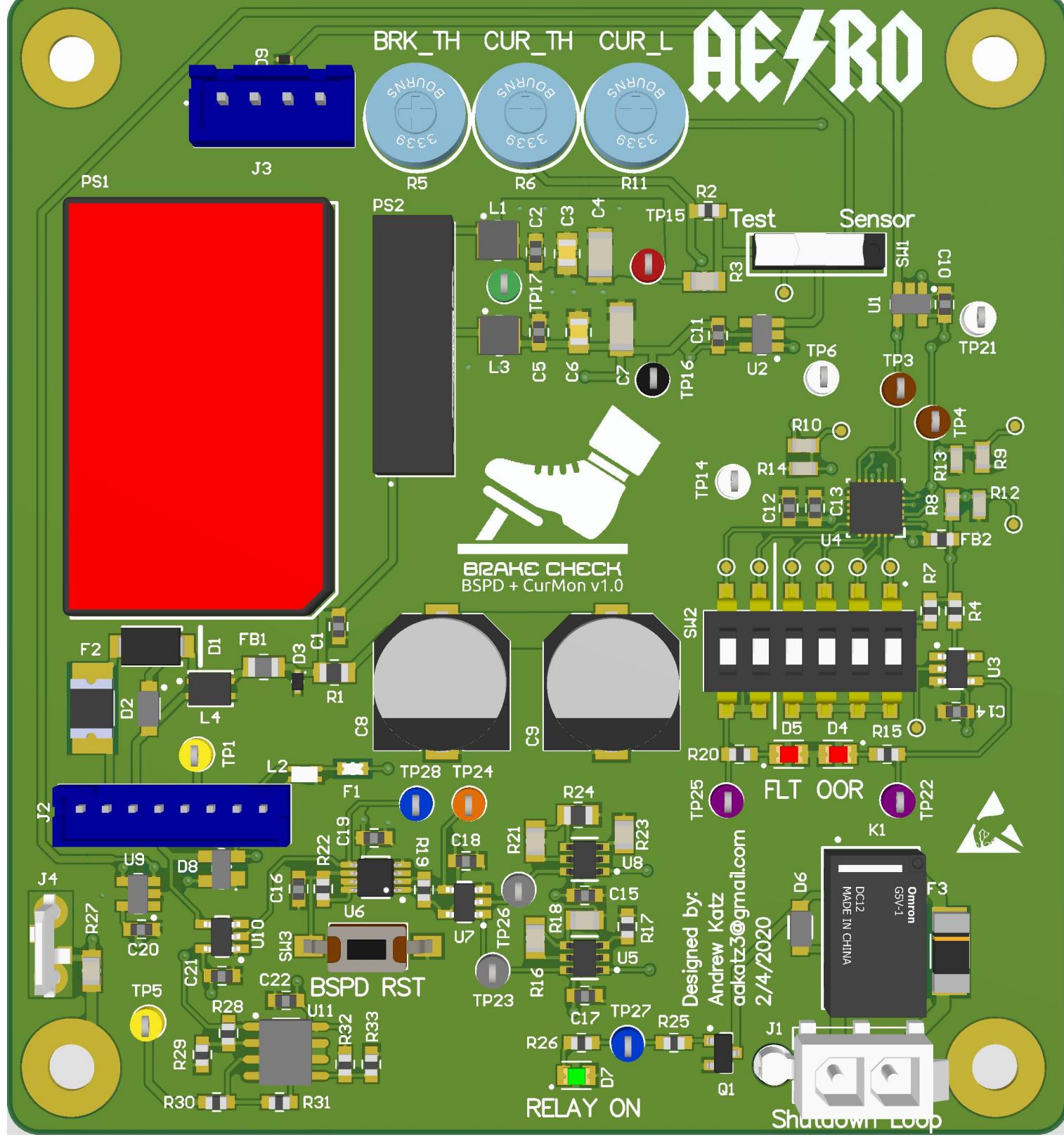
ACERO





BRAKE CHECK
BSPD + CurMon v1.0

AC/RO





BRAKE CHECK
BSPD + CurMon v1.0

AERO



Line #	Name	Designator	Quantity	Manufacturer 1	Manufacturer Part Number 1	Supplier 1	Supplier Part Number 1
1	2-770872-0	J1	1	TE Connectivity	1-770872-0	Digi-Key	A32449-ND
2	1N4148W-TP	D6	1	MCC	1N4148W-TP	ouser	833-1N4148W-TP
3	2-520183-2	P3	1	TE Connectivity	2-520183-2	Digi-Key	A27817CT-ND
4	2N7002-F	O1	1	Diodes	2N7002-F	ouser	621-2N7002-F
5	1812L050/30PR	F2	1	Littlefuse	1812L050/30PR	ouser	576-1812L050/30PR
6	3339H-1-103LF	R5, R6, R11	3	Bourns	3339H-1-103LF	Digi-Key	3339H-103LF-ND
7	5000	TP15	1	Keystone Electronics	5000	Digi-Key	36-5000-ND
8	5001	TP16	1	Keystone Electronics	5001	Digi-Key	36-5001-ND
9	5002	TP6, TP14, TP21	3	Permbond	5002	Digi-Key	36-5002-ND
10	5003	TP24	1	Keystone Electronics	5003	Digi-Key	36-5003-ND
11	5004	TP1, TP5	2	Keystone Electronics	5004	Digi-Key	36-5004-ND
12	5115	TP3, TP4	2	Keystone Electronics	5115	Digi-Key	36-5115-ND
13	5116	TP17	1	Keystone Electronics	5116	Digi-Key	36-5116-ND
14	5117	TP27, TP28	2	Keystone Electronics	5117	Digi-Key	36-5117-ND
15	5118	TP23, TP26	2	Keystone Electronics	5118	Digi-Key	36-5118-ND
16	5119	TP22, TP25	2	Keystone Electronics	5119	Digi-Key	36-5119-ND
17	172165-1	P1	1	AMP - TE CONNECTIVITY	172165-1	Digi-Key	A25587-ND
18	0454005.MR	F3	1	Littlefuse	0454005.MR	Digi-Key	F3147CT-ND
19	770904-1	PIN3, PIN5	2	TE Connectivity	770904-1	Digi-Key	A25684CT-ND
20	1217861-1	J4	1	AMP - TE CONNECTIVITY	1217861-1	Digi-Key	A100452CT-ND
21	744231261	L2	1	Wurth Electronics	744231261	Digi-Key	732-1467-6-ND
22	A08KR08KR26E152B	JP1	1	JST	A08KR08KR26E152B	Digi-Key	455-3153-ND
23	ACP3225-102-2P-T000	I4	1	TDK	ACP3225-102-2P-T000	ouser	810-ACP32251022PT000
24	B4B-XH-A(LF)(SN)	J3	1	JST	B4B-XH-AM(LF)(SN)	Digi-Key	455-2237-ND
25	BBB-PH-K-S(LF)(SN)	J2	1	JST	BBB-PH-K-S(LF)(SN)	Digi-Key	455-1710-ND
26	B340A-13-F	D1	1	Diodes	B340A-13-F	Digi-Key	B340A-FDIDKR-ND
27	CAP 47uF 10V 1206(3216)	C4, C7	2	KEMET	C1206C476M48PACTU	Digi-Key	399-5508-1-ND
28	CAP 0603 0.1uF 16V 10% X7R	C10, C11, C12, C14, C18, C19, C20, C21, C22	9	Kyocera AVX	0603YC104KAT2A	ouser	581-060316C104K
29	CAP 0603 1PF 50V 0.05PF MLO	C16	1	Kyocera AVX	ML03511R0BAT2A	ouser	581-ML03511R0BAT2A
30	CAP 0603 1uF 50V 10% X7R	C2, C5	2	TDK	C1608X5R1H105K080AB	Digi-Key	445-7468-6-ND
31	CAP 0603 10uF 25V 20% X5R	C1, C13, C15, C17	4	Murata	GRM188R61E106MA73J	ouser	81-GRM188R61E106MA3J
32	CAP 0805 4.7uF 35V 10% X7R	C3, C6	2	TDK	C2012X7R1V475K125AC	ouser	810-C2012X7R1V475KAC
33	CL-SA-12C-02	SW1	1	Nidec Copal	CL-SA-12C-02	Digi-Key	563-1388-ND
34	DF2B6.8AFS.L3M	D9	1	Toshiba	DF2B6.8AFS.L3M	ouser	757-DF2B6.8AFS.L3M
35	DS04-254-2-048K-SMT-TR	SW2	1	CUI Devices	DS04-254-2-068K-SMT-TR	ouser	490-DS04254206BK-STR
36	ERA6AE6813V	R18, R23	2	Panasonic	ERA-6AE6813V	Digi-Key	P681KDADKR-ND
37	ESD5Z12T1G	D3	1	ON Semiconductor	ESD5Z12T1G	Digi-Key	ESD5Z12T1GOSCT-ND
38	Ferrite Chip 120 Ohms	FB2	1	TDK	MMZ1608S121ATA00	Digi-Key	445-2173-6-ND
39	Ferrite Chip 1500 Ohms	FB1	1	Wurth Electronics	742792097	Digi-Key	732-4649-6-ND
40	FSMSMTR	SW3	1	TE Connectivity	FSMSMTR	Digi-Key	450-1758-1-ND
41	G5V-1-DC12	K1	1	Omron	G5V-1-DC12	ouser	653-G5V-1-DC12
42	LMV7231SQE/NO PB	U4	1	TI National Semiconductor	LMV7231SQE/NOPB	Digi-Key	LMV7231SQE/NOPBCT-ND
43	LTC6994CS6-#TRMPBF	U5, U8	2	Analog Devices / Linear Technology	LTC6994CS6-#TRMPBF	Digi-Key	LTC6994CS6-#TRMPBFCT-ND
44	MCP6002T-I/SN	U11	1	Microchip	MCP6002T-I/SN	Digi-Key	MCP6002T-I/SNDKR-ND
45	MF-FSMF010X-2	F1	1	Bourns	MF-FSMF010X-2	Digi-Key	MF-FSMF010X-2CT-ND
46	NCS2003SN2T1G	U1, U2, U9	3	ON Semiconductor	NCS2003SN2T1G	Digi-Key	NCS2003SN2T1GOSDKR-ND
47	NMK1205SC	PS2	1	Murata	NMK1205SC	Digi-Key	811-3393-5-ND
48	PHR-4	P2	1	JST	PHR-4	Digi-Key	455-1164-ND
49	RES 0603 10K 1%	R4, R7	2	Yageo	RC0603FR-0710KL	ouser	603-RC0603FR-0710KL
50	RES 0603 4.7K 1%	R22	1	Panasonic	ERJ3EKF4702V	Digi-Key	P47.0KHDKR-ND
51	RES 0603 49.9K 0.1%	R17	1	Panasonic	ERA-3AEB4992V	Digi-Key	P49.9KDBDKR-ND
52	RES 0603 62.6K 0.1%	R28, R31	2	Vishay	TNPW060362K6BEEN	ouser	71-TNPW060362K6BEEN
53	RES 0603 100K 0.1%	R29, R30, R32, R33	4	Panasonic	ERA-3AEB104V	Digi-Key	P100KDBDKR-ND
54	RES 0603 200 1%	R19, R25	2	Panasonic	ERJ3EKF2000V	ouser	667-ERJ3EKF2000V
55	RES 0603 330K 1%	R2	1	Panasonic	ERJ3EKF3303V	ouser	667-ERJ3EKF3303V
56	RES 0603 620 1%	R15, R20, R26	3	Yageo	RC0603FR-07620RL	Digi-Key	311-620-HDRX-ND
57	RES 0805 2 1%	R7	1	Panasonic	ERJ6ENF2001V	ouser	667-ERJ6ENF2001V
58	RES 0805 523K 0.1%	R24	1	Panasonic	ERJPB8B5233V	Digi-Key	P20904DKR-ND
59	RR0816P-183-D	R9	1	Susumu	RR0816P-183-D	Digi-Key	RR08P18.0KDC7-ND
60	RR0816P-272-D	R12, R14	2	Susumu	RR0816P-272-D	Digi-Key	RR08P2.7KDC7-ND
61	RR0816P-301-D	R8, R10	2	Susumu	RR0816P-301-D	Digi-Key	RR08P3000DC7-ND
62	RT0603DR072KL	R13	1	Yageo	RT0603DR072KL	Digi-Key	311-2525-1-ND
63	RT0805BRE071ML	R3, R16, R21, R27	4	Yageo	RT0805BRE071ML	Digi-Key	YAG4967DKR-ND
64	SM0805SCL	D7	1	Bivar	SM0805SCL	Digi-Key	492-225-1-ND
65	SM0805HCL	D4, D5	2	Bivar	SM0805HCL	Digi-Key	492-2281-1-ND
66	SN74LV1T125DBVR	U7	1	Texas Instruments	SN74AHCT1G32DBVR	Digi-Key	296-1115-1-ND
67	SN74LV1T125DBVR	U10	1	Texas Instruments	SN74LV1T125DBVR	Digi-Key	296-37172-6-ND
68	SN74LVC1G04DBVR	U3	1	Texas Instruments	SN74LVC1G04DBVR	Digi-Key	296-11599-1-ND
69	SN74LVC2G74DCT	U6	1	Texas Instruments	SN74LVC2G74DCTR	Digi-Key	296-13273-1-ND
70	SP0503BAHTG	D8	1	Littlefuse	SP0503BAHTG	Digi-Key	F2715CT-ND
71	SRN3015-220M	L1, L3	2	Bourns	SRN3015-220M	Digi-Key	SRN3015-220MCT-ND
72	SXH-001T-PO.6	PIN1, PIN2, PIN4, PIN6	4	JST	SXH-001T-PO.6	Digi-Key	455-1135-1-ND
73	SZMMSZ5243BT1C	D2	1	ON Semiconductor	SZMMSZ5243BT1C	Digi-Key	SZMMSZ5243BT1GOSDKR-ND
74	UUD1V331MNL1G	C8, C9	2	Nichicon	UUD1V331MNL1GS	Digi-Key	493-2293-1-ND
75	UUD1V331MNL1G	S	1				

Design Rules Verification Report

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

Warnings 0
Rule Violations 0

Warnings	
Total	0
Rule Violations	
Clearance Constraint (Gap=6mil) (All), (All)	0
Clearance Constraint (Gap=6mil) (IsStitchingVia), ((OnLayer('Top Overlay')))	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
Routing Via (MinHoleWidth=8.268mil) (MaxHoleWidth=50mil) (PreferredHoleWidth=15mil) (MinWidth=15.748mil)	0
Power Plane Connect Rule(Relief Connect)(Expansion=20mil) (Conductor Width=10mil) (Air Gap=10mil) (Entries=4)	0
Fabrication Testpoint Style (Under Component=Yes) (All)	0
Fabrication Testpoint Usage (Valid =Don't care, Allow multiple per net=No) (All)	0
Assembly Testpoint Style (Under Component=Yes) (All)	0
Assembly Testpoint Usage (Valid =Don't care, Allow multiple per net=No) (All)	0
Minimum Annular Ring (Minimum=3mil) (All)	0
Acute Angle Constraint (Minimum=60.000) (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	CurrentScaler.SchDoc	Net 2.5_RDIV has no driving source (Pin R32-1, Pin R33-2, Pin U11-5)
Warning	Comparator.SchDoc	Net \OOR_FLT has no driving source (Pin R4-1, Pin SW2-9, Pin SW2-10, Pin SW2-11, Pin SW2-12, Pin TP7-1, Pin U3-2)
Warning	LatchDelay.SchDoc	Net \RST has no driving source (Pin C16-1, Pin R22-2, Pin SW3-1, Pin U6-6)
Warning	TOP.SchDoc	Net BRAKE_IN has no driving source (Pin D8-2, Pin J2-6, Pin TP1-1, Pin U1-3, Pin U9-3)
Warning	Comparator.SchDoc	Net BRAKE_OOR_H has no driving source (Pin R10-1, Pin R14-2, Pin TP20-1, Pin U4-8)
Warning	Comparator.SchDoc	Net BRAKE_OOR_L has no driving source (Pin R9-1, Pin R13-2, Pin TP19-1, Pin U4-5)
Warning	Comparator.SchDoc	Net BRAKE_THRESH has no driving source (Pin R5-2, Pin TP6-1, Pin U4-11)
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 R8-1, Pin R12-2, Pin TP18-1, Pin U4-4)
Warning	Comparator.SchDoc	Net CUR_OOR_L has no driving source (Pin R11-2, Pin TP21-1, Pin U4-1)
Warning	Comparator.SchDoc	Net CUR_THRESH has no driving source (Pin R2-1, Pin R6-2, Pin TP14-1, Pin U4-9)
Warning	LatchDelay.SchDoc	Net FAULT_EN has no driving source (Pin R19-1, Pin U6-2)
Warning	LatchDelay.SchDoc	Net FAULT_TIM has no driving source (Pin TP26-1, Pin U7-2, Pin U8-6)
Warning	LatchDelay.SchDoc	Net OOR_TIM has no driving source (Pin TP23-1, Pin U5-6, Pin U7-1)
Warning	CurrentScaler.SchDoc	Net VN has no driving source (Pin R28-2, Pin R29-2, Pin U11-2)
Warning	CurrentScaler.SchDoc	Net VP has no driving source (Pin R30-2, Pin R31-2, 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))