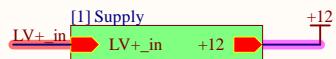
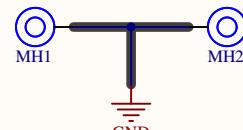


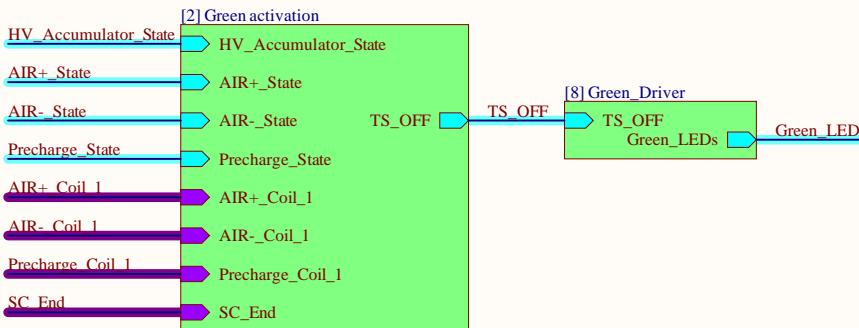
A



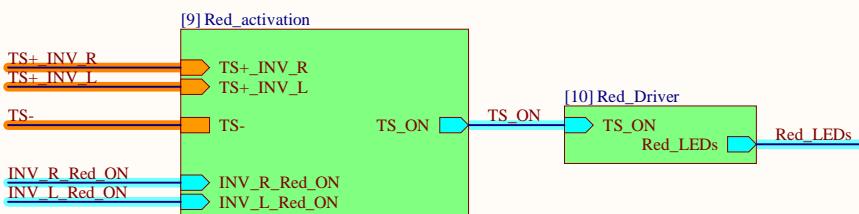
This PCB is installed in the power distribution box (HV Box) and is capable of controlling TSAL\_Light according to 2023 FSG rules. It needs signals from AMS\_Master (or TSAL\_Dummy) and TSAL\_Inverters. TS Voltage detection schematic [9] is DNP for 2023 but used in 2024 due to merging of inverter housings.



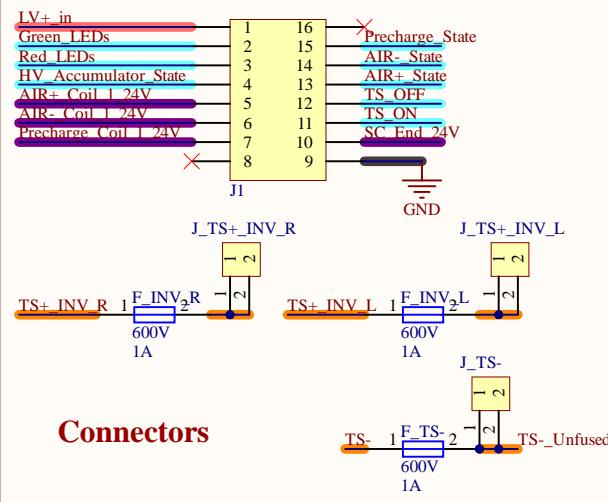
B



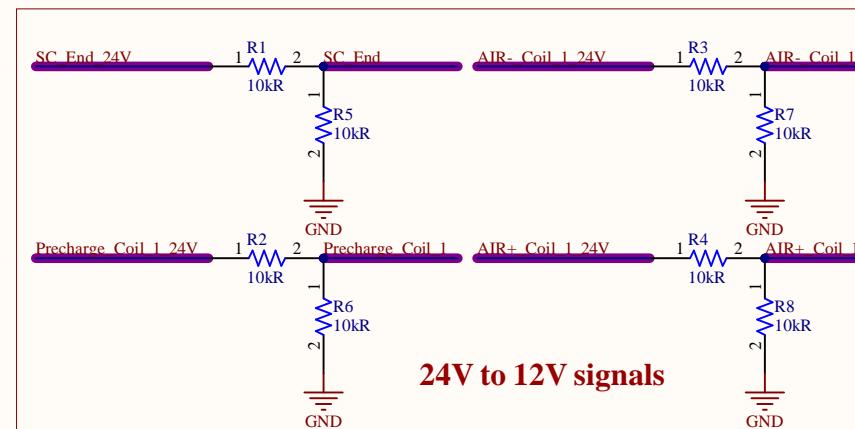
Signal	12V	1V	0V
Relay_AUX	relay is open	relay is closed	broken wire
HV_Accumulator_State	no voltage in accumulator	more than 60VDC in accumulator	broken wire
Relay_Coil_1	relay is open	N/A	relay is closed
INV_X_Red_ON	no voltage in inverters' box	more than 60VDC in inverters' box	broken wire



Cyan: External signal  
Orange: High Voltage  
Red: Untreated supply  
Pink: Treated supply  
Purple: Shutdown chain



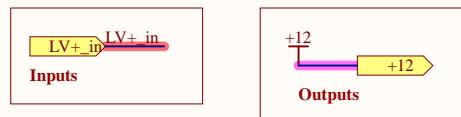
## Connectors



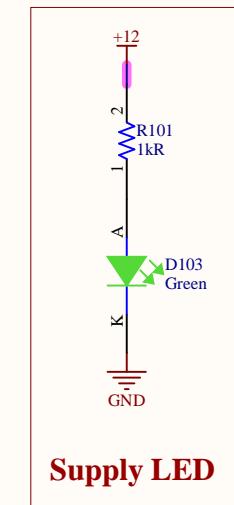
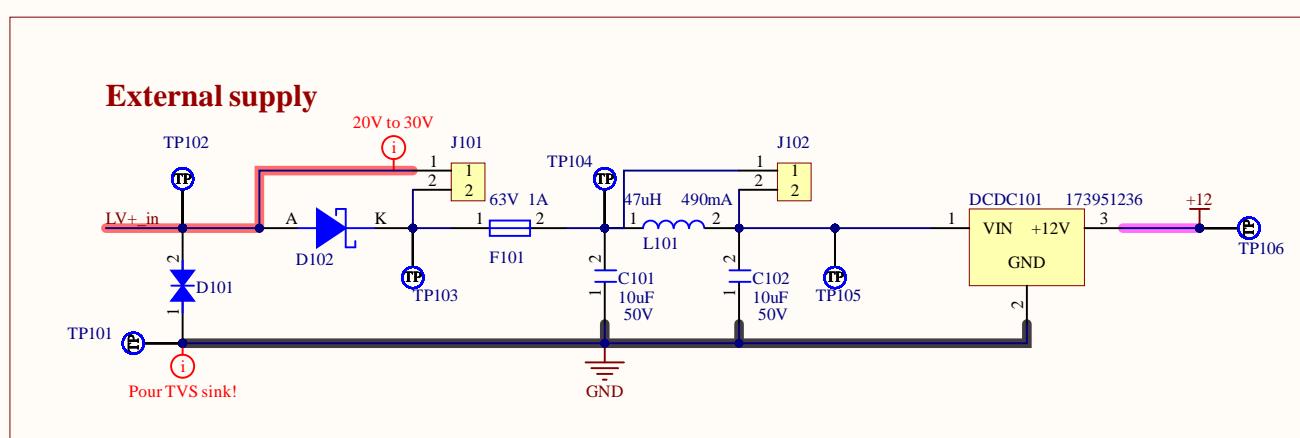
## 24V to 12V signals

Company:	e-Tech Racing	e-techracing.es	
Project:	TSAL_Control	Variant: [No Variations]	
Size:	Page Contents: TSAL_Control.SchDoc	Version: 6.0	
-		Department: Hardware	
Author:	Guillermo Ropero	guillermoropero@gmail.com	Sheet 1 of 11
Checked by:		Date: 06/11/2023	

A



B

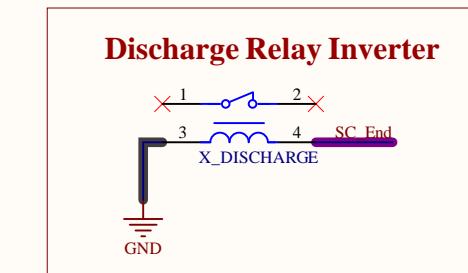
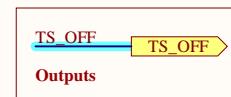
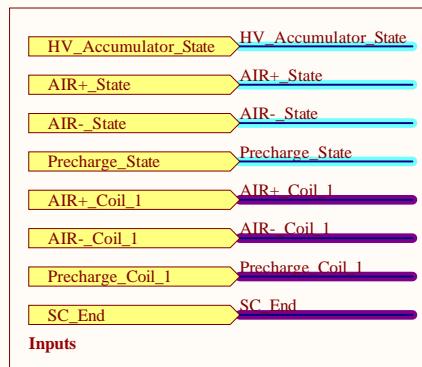


C

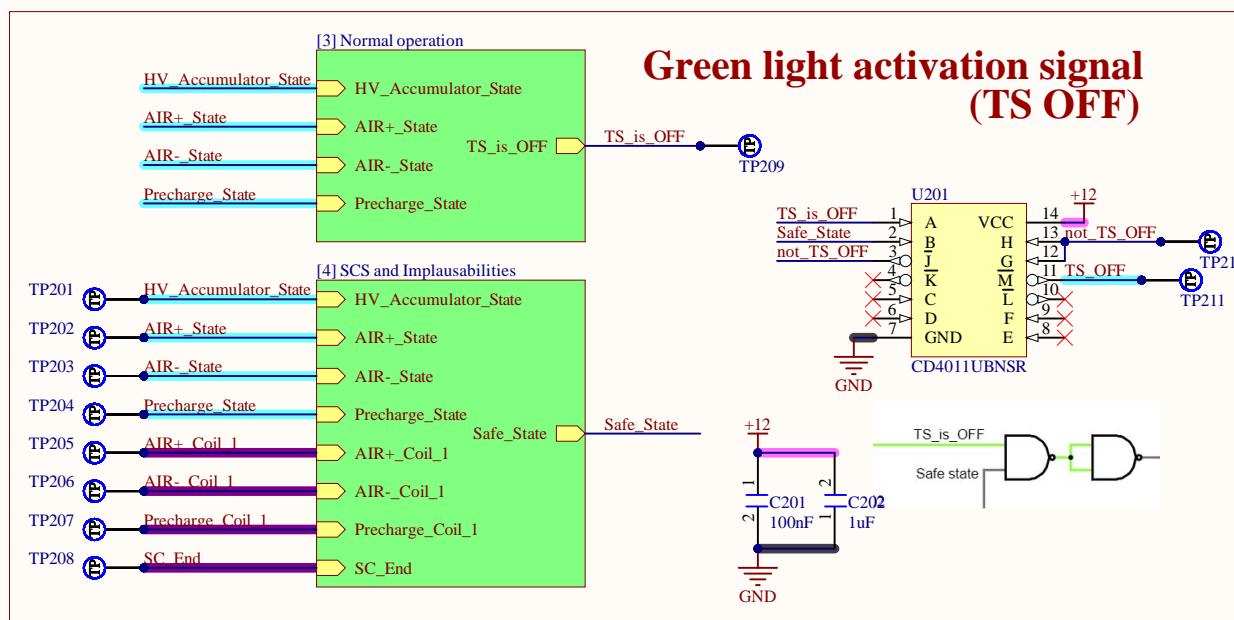
D

Company:	e-Tech Racing	e-techracing.es	
Project:	TSAL_Control	Variant: [No Variations]	
Size:	Page Contents: [1]Supply.SchDoc	Version: 6.0	
-		Department: Hardware	
Author:	Guillem Ropero	guillemropere@gmail.com	Sheet 2 of 11
Checked by:			Date: 06/11/2023

A



B

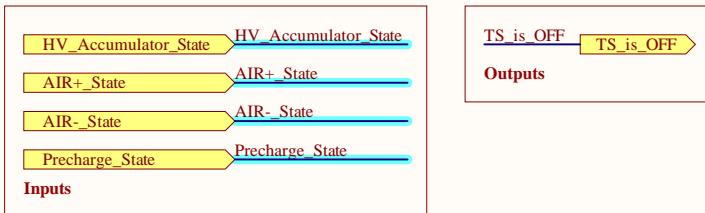


C

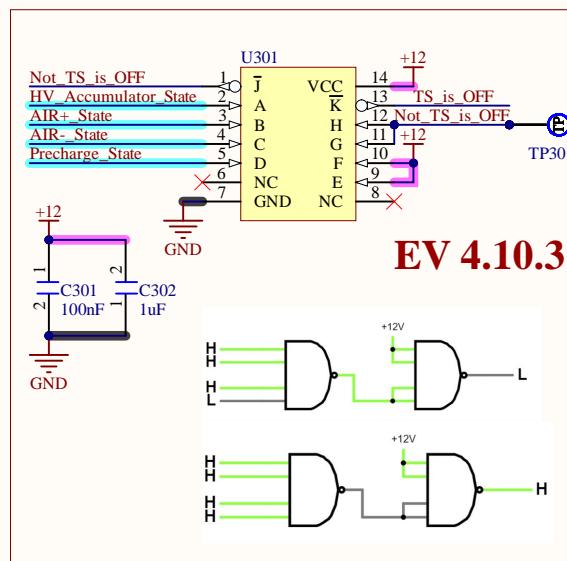
D

Company:	e-Tech Racing	e-techracing.es	
Project:	TSAL_Control	Variant: [No Variations]	
Size:	Page Contents: [2] Green activation.SchDoc	Version: 6.0	
-		Department: Hardware	
Author:	Guillen Ropero	guillemrproper@gmail.com	Sheet 3 of 11
Checked by:			Date: 06/11/2023

A



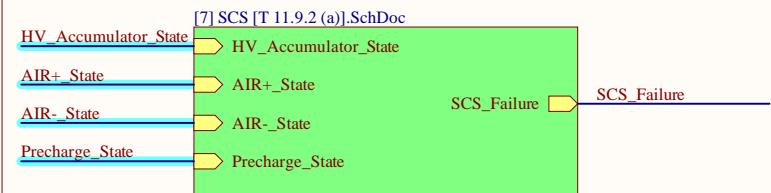
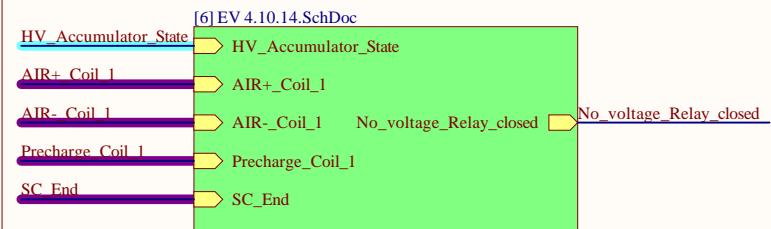
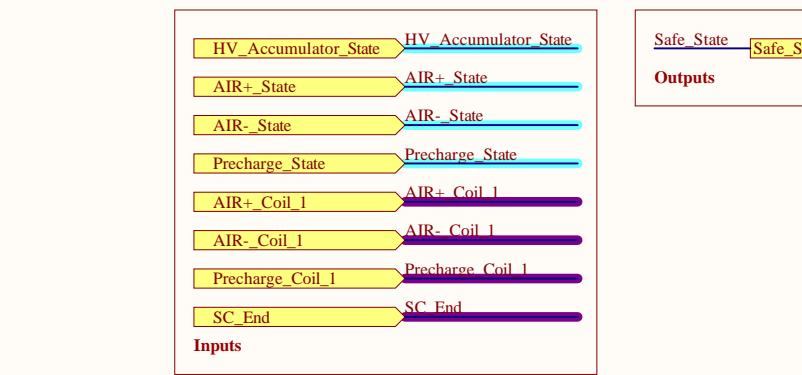
B



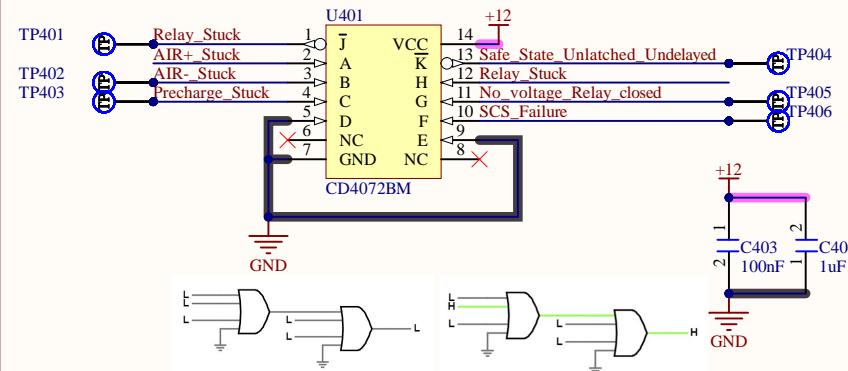
C

D

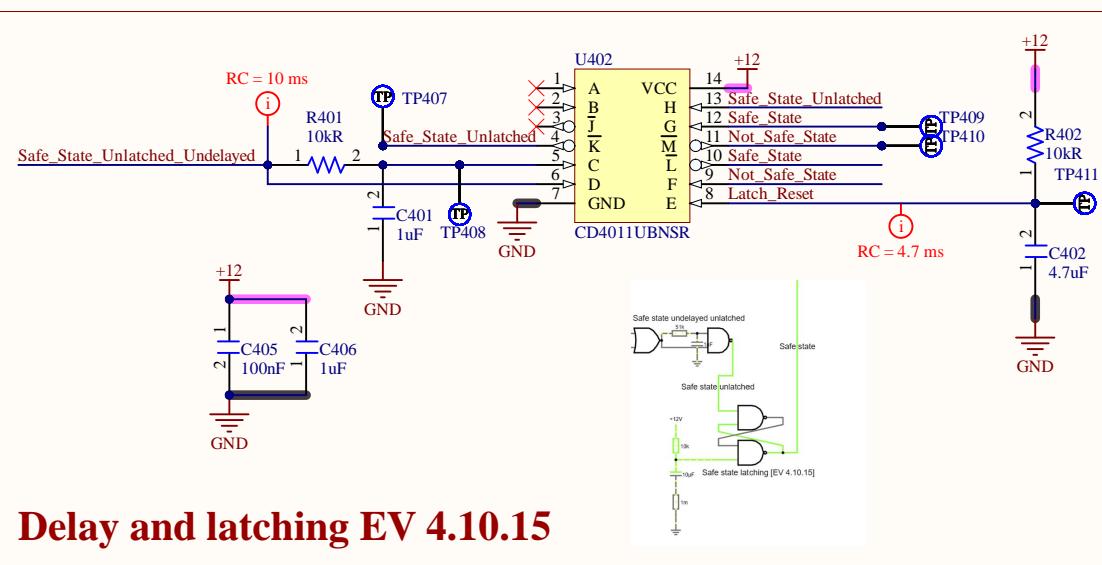
Company:	e-Tech Racing	e-techracing.es	
Project:	TSAL_Control	Variant: [No Variations]	
Size:	Page Contents: [3]Normal operation.SchDoc	Version: 6.0	
-		Department: Hardware	
Author:	Guillen Ropero	guillelroper@gmail.com	Sheet 4 of 11
Checked by:			Date: 06/11/2023



## SCS and Implausibilities



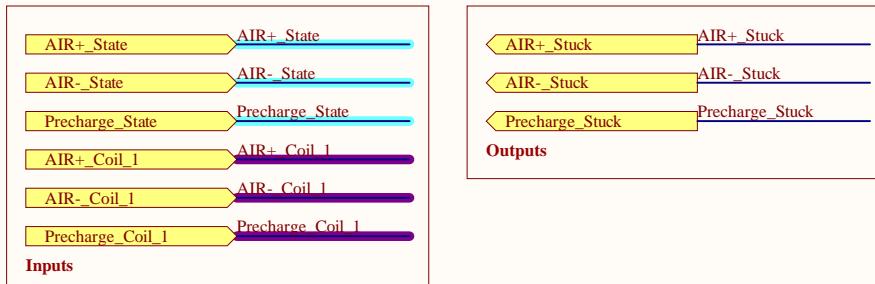
## Implausibilities merging



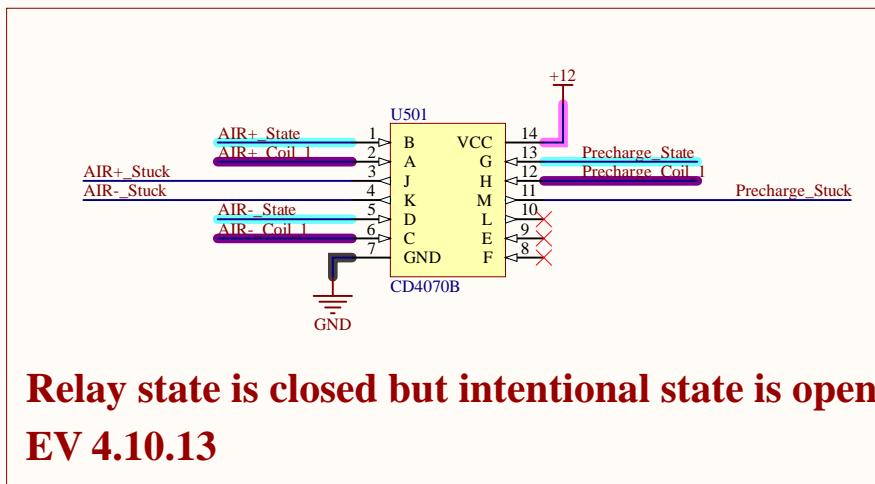
## Delay and latching EV 4.10.15

Company:	e-Tech Racing	e-techracing.es	
Project:	TSAL_Control	Variant: [No Variations]	
Size:	Page Contents: [4] SCS and Implausibilities.SchDoc	Version: 6.0	
		Department: Hardware	
Author:	Guillermo Ropero	guillermo.ropero@gmail.com	Sheet 5 of 11
Checked by:		Date: 06/11/2023	

A



B



Relay\_intentional\_state



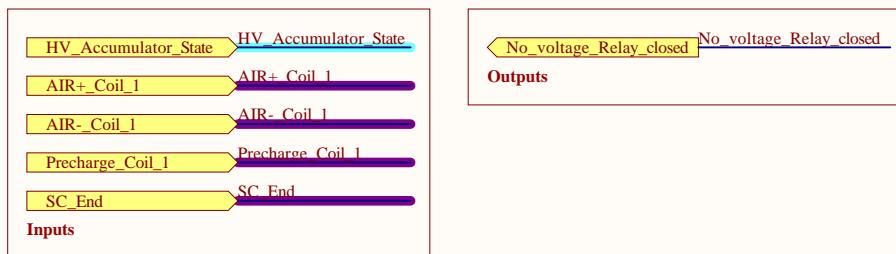
Relay\_AUX\_state



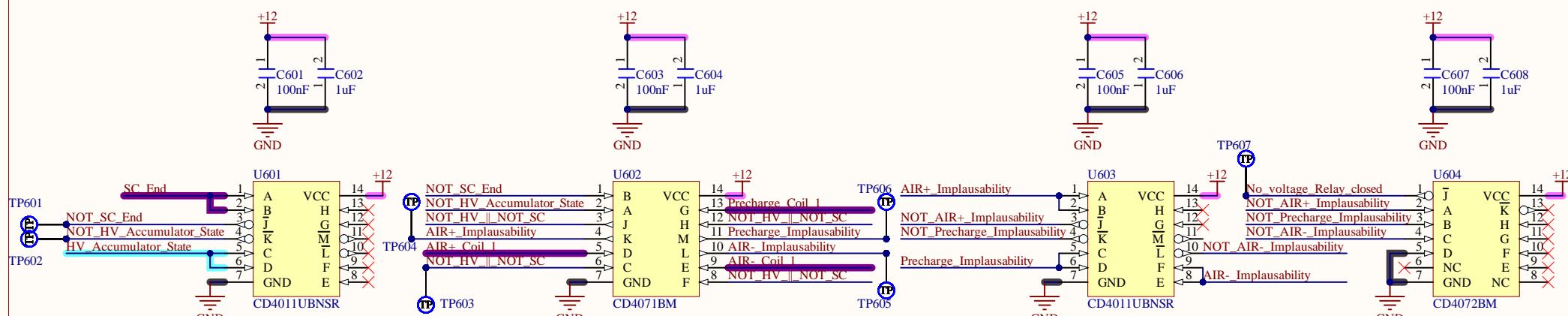
C

Company:	e-Tech Racing	e-techracing.es	
Project:	TSAL_Control	Variant: [No Variations]	
Size:	Page Contents: [5]EV 4.10.13.SchDoc	Version: 6.0	
-		Department: Hardware	
Author:	Guillem Ropero	guillemrproper@gmail.com	Sheet 6 of 11
Checked by:			Date: 06/11/2023

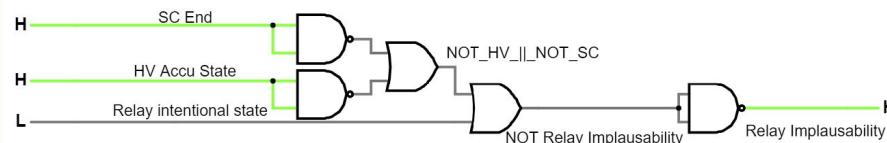
A



B



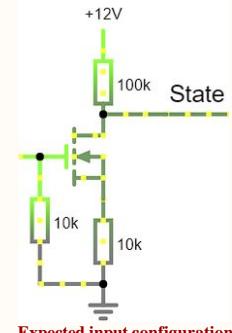
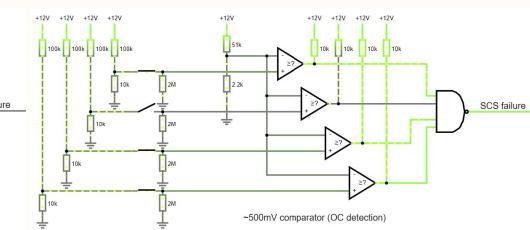
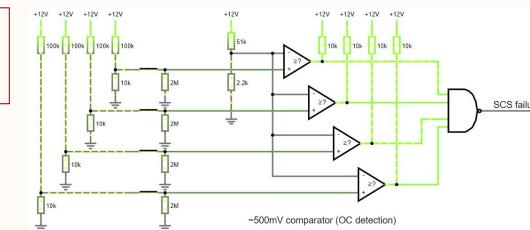
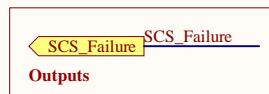
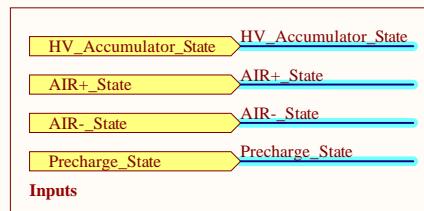
**SC is closed, intentional state is closed but no voltage is present [EV 4.10.14]**



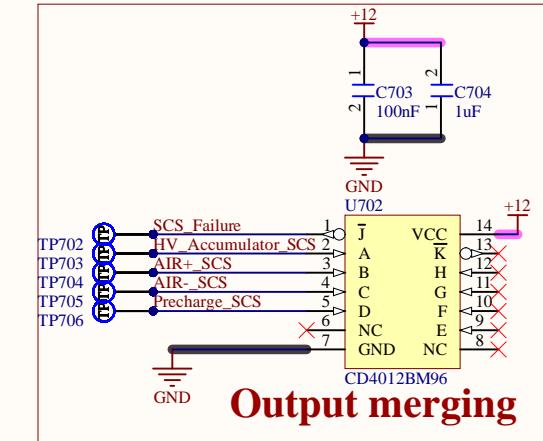
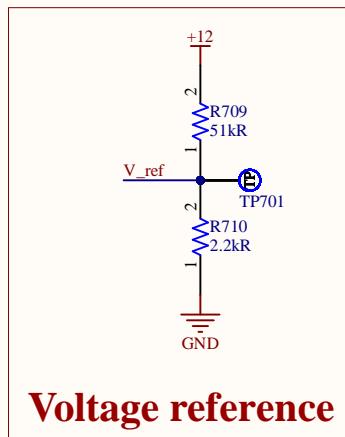
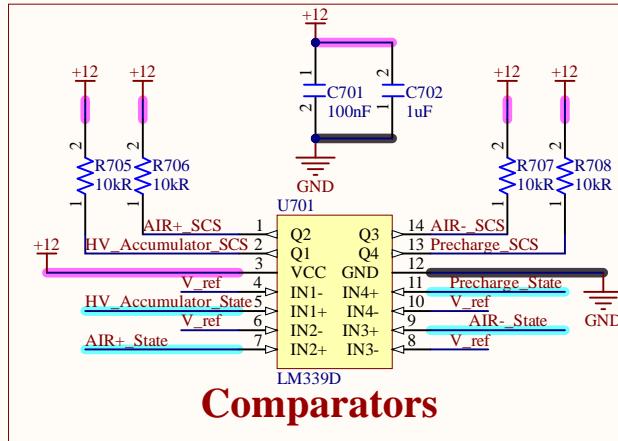
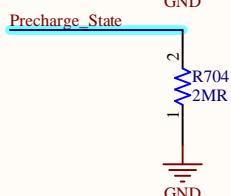
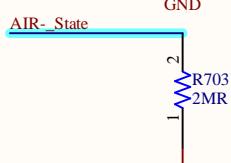
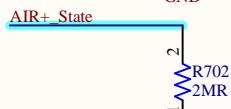
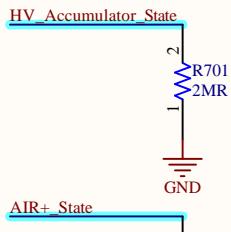
**NOT\_HV || NOT\_SC** is common for the three relays

Company:	e-Tech Racing	e-techracing.es	
Project:	TSAL_Control	Variant: [No Variations]	
Size:	Page Contents: [6] EV 4.10.14.SchDoc	Version: 6.0	
		Department: Hardware	
Author:	Guillen Ropero	guillemrproper@gmail.com	Sheet 7 of 11
Checked by:			Date: 06/11/2023

A



## Inputs pull down



Company:	e-Tech Racing	e-techracing.es	
Project:	TSAL_Control	Variant: [No Variations]	
Size:	Page Contents: [7]SCS[T 11.9.2 (a)].SchDoc	Version: 6.0	
-		Department: Hardware	
Author:	Guillem Ropero	guillemropere@gmail.com	Sheet 8 of 11
Checked by:			Date: 06/11/2023

A

B

C

D

A

A

B

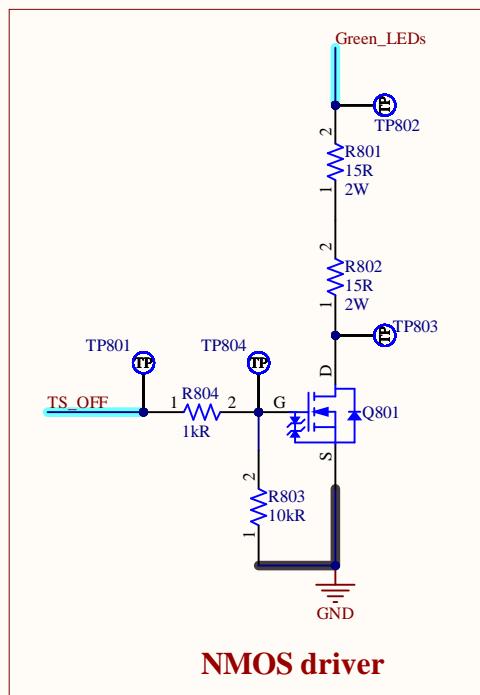
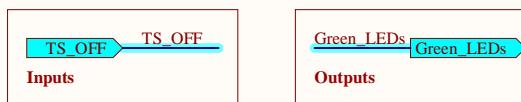
B

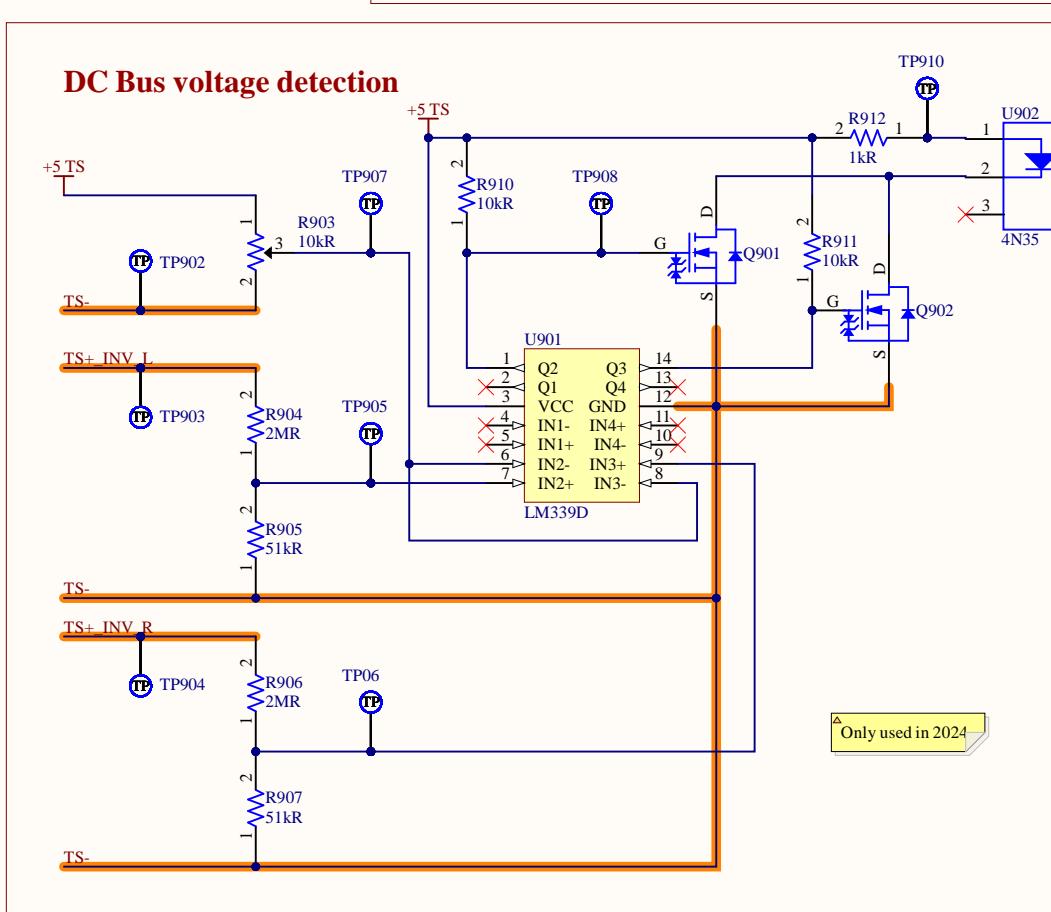
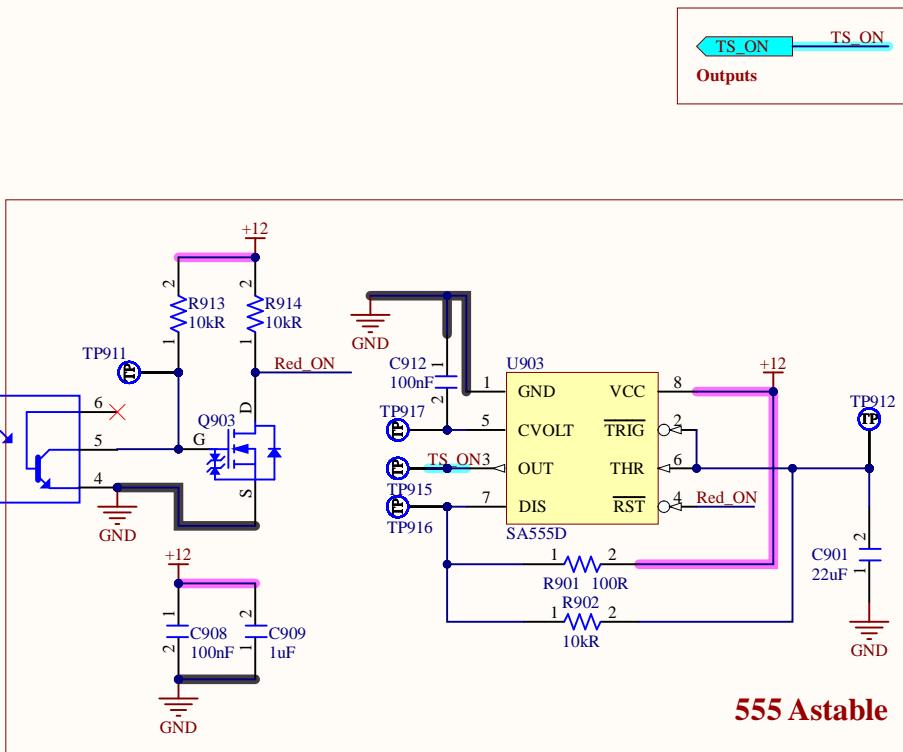
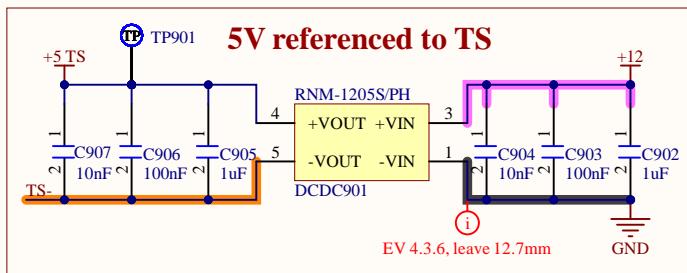
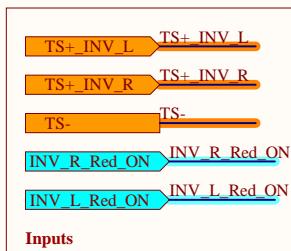
C

C

D

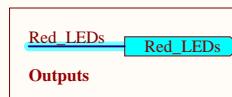
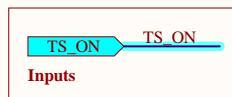
D





Company: e-Tech Racing		e-techracing.es	
Project: TSAL_Control		Variant: [No Variations]	
Size:	Page Contents: [9] Red_activation.SchDoc	Version:	6.0
-		Department:	Hardware
Author:	Guillem Ropero	Sheet 10 of 11	guillemproper@gmail.com
Checked by:		Date:	06/11/2023

A



B

C

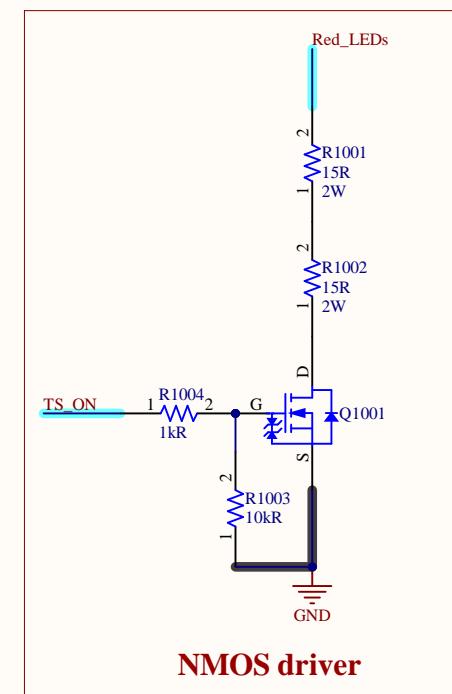
D

A

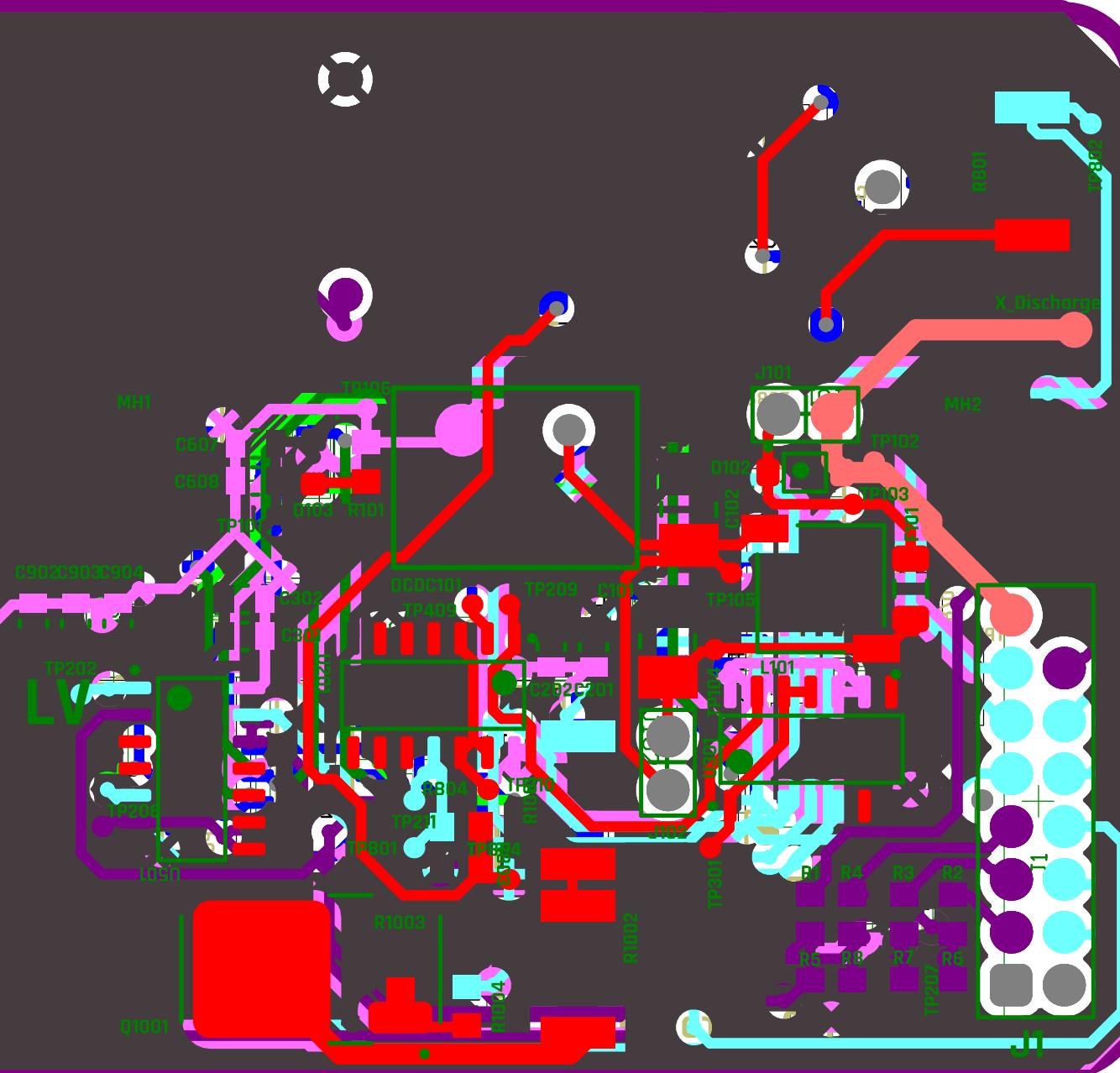
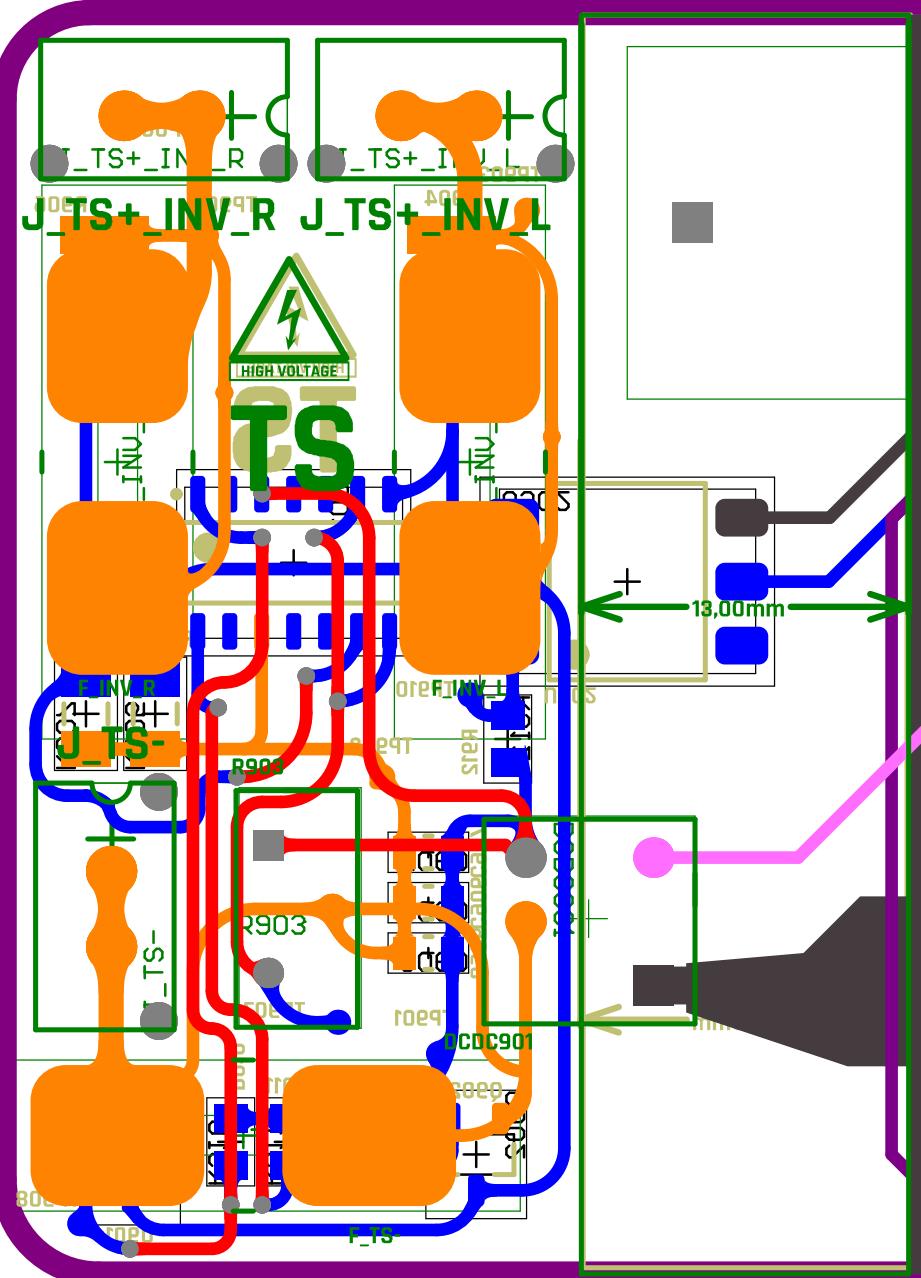
B

C

D

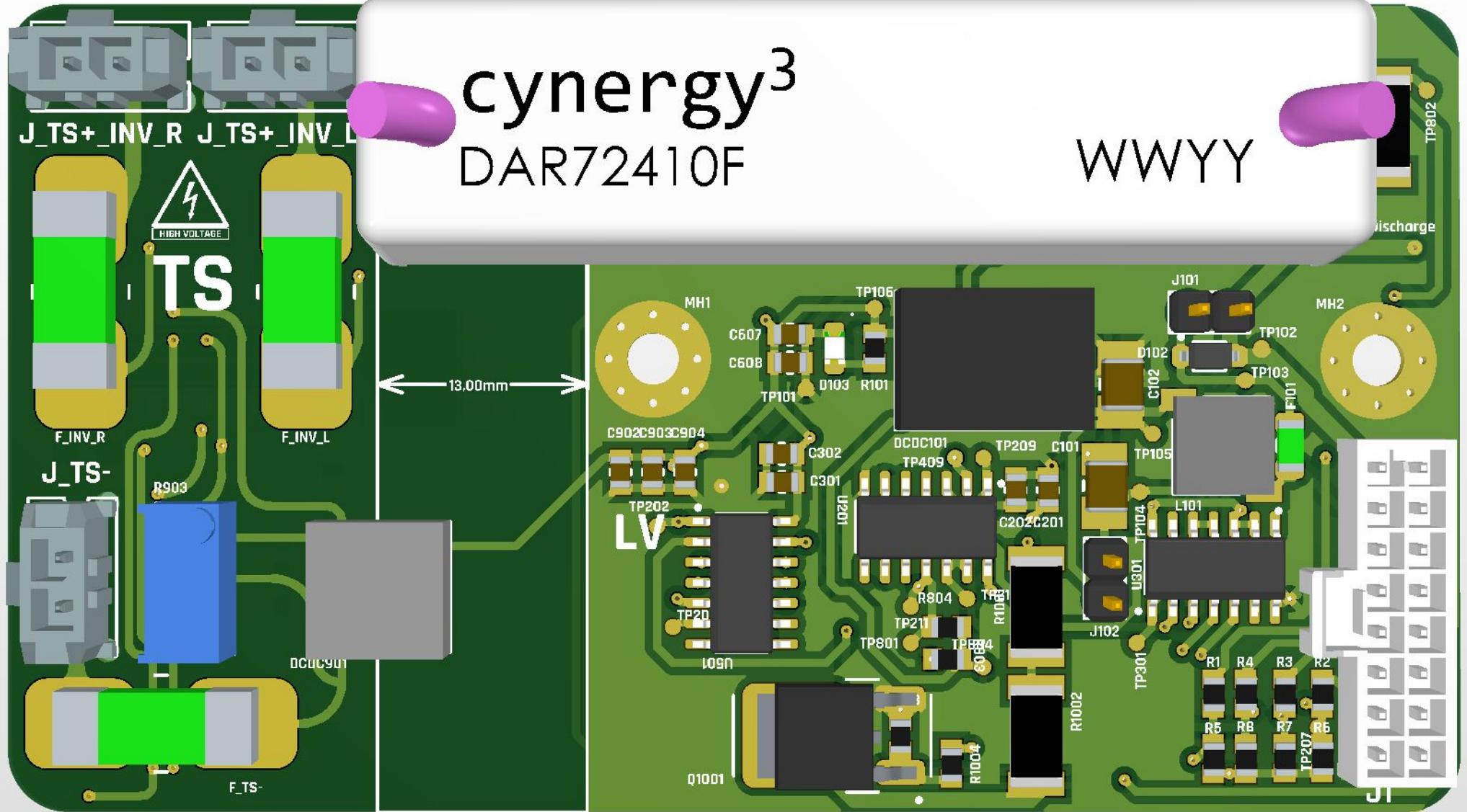


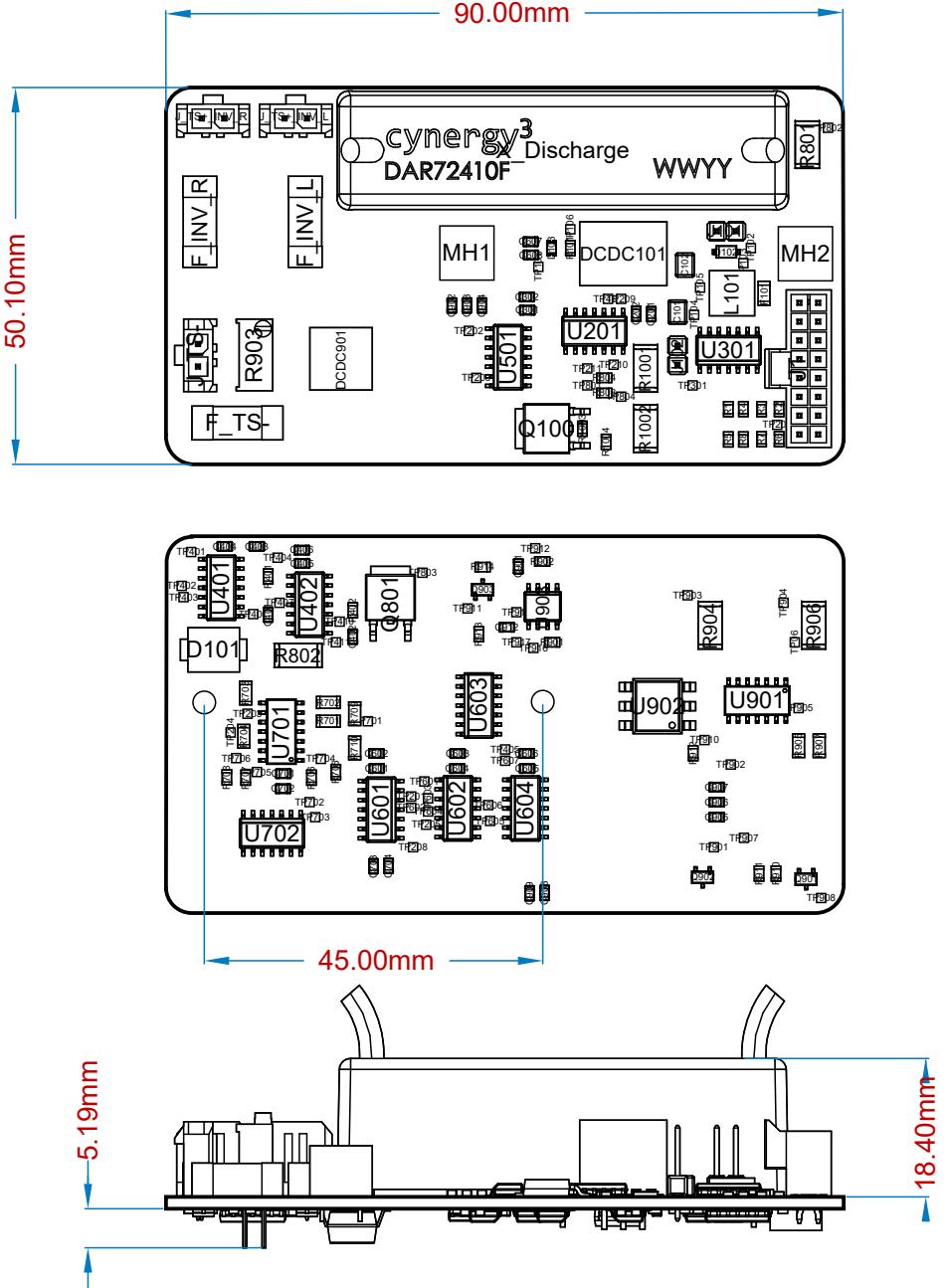
Company:	e-Tech Racing	e-techracing.es	
Project:	TSAL_Control	Variant: [No Variations]	
Size:	Page Contents: [10] Red_Driver.SchDoc	Version: 6.0	
-		Department: Hardware	
Author:	Guillem Ropero	guillemropere@gmail.com	Sheet 11 of 11
Checked by:			Date: 06/11/2023



# cynergy<sup>3</sup>

DAR72410F





# TSAL Control

Line #	Designator	Name	Quantity
C101, C102		GRJ32ER71H106KE11L	2
C201, C301, C403, C405, C601, C603, C605, C607, C701, C703, C903, C906, C908, C912		885012207098	14
C202, C302, C401, C404, C406, C602, C604, C606, C608, C702, C704, C902, C905, C909		885012207103	14
C402		GRM219R61A475KE34D	1
C901		885012107011	1
C904, C907		885012207092	2
D101		824551301	1
D102		MBR0530	1
D103		150080VS75000	1
DCDC101		173951236	1
DCDC901		RNM-1205S/PH	1
F101		0437001.WRA	1
F INV L, F INV R, F_TS-		485001	3
J1		1053101116	1
J101, J102		61300211121	2
J_TS-, J_TS+ INV L, J_TS+ INV R		436500215	3
L101		CDC5D23BNP-470KC	1
MH1, MH2		Mounting_Hole_M3	2
Q801, Q1001		SQ2318BES-T1 GE3	2
Q901, Q902, Q903		SQ2318BES-T1 GE3	3
R1, R2, R3, R4, R5, R6, R7, R8, R401, R402, R705, R706, R707, R708, R803, R902, R910, R911, R913, R914, R1003		CR0805-JW-103ELF	21
R101, R804, R912, R1004		CR0805-JW-102ELF	4
R701, R702, R703, R704		HVC1206-2M0FT3	4
R709, R905, R907		CRCW120610K0FKEA	3
R710		CR1206-FX-2201ELF	1
R801, R802, R1001, R1002		352115RFT	4
R901		CR0805-FX-1000ELF	1
R903		3296W-1-103LF	1
R904, R906		R2M-2512FTK	2
U201, U402, U601, U603		CD4011UBSNR	4
U301, U702		CD4012BM96	2
U401, U604		CD4072BM	2
U501		Arrayy_4x2 XOR	1
U602		CD4071BM	1
U701		LM339D	1
U901		LM339D	1
U902		4N35	1
U903		SA555	1
X_DISCHARGE		DBR72410FU	1

