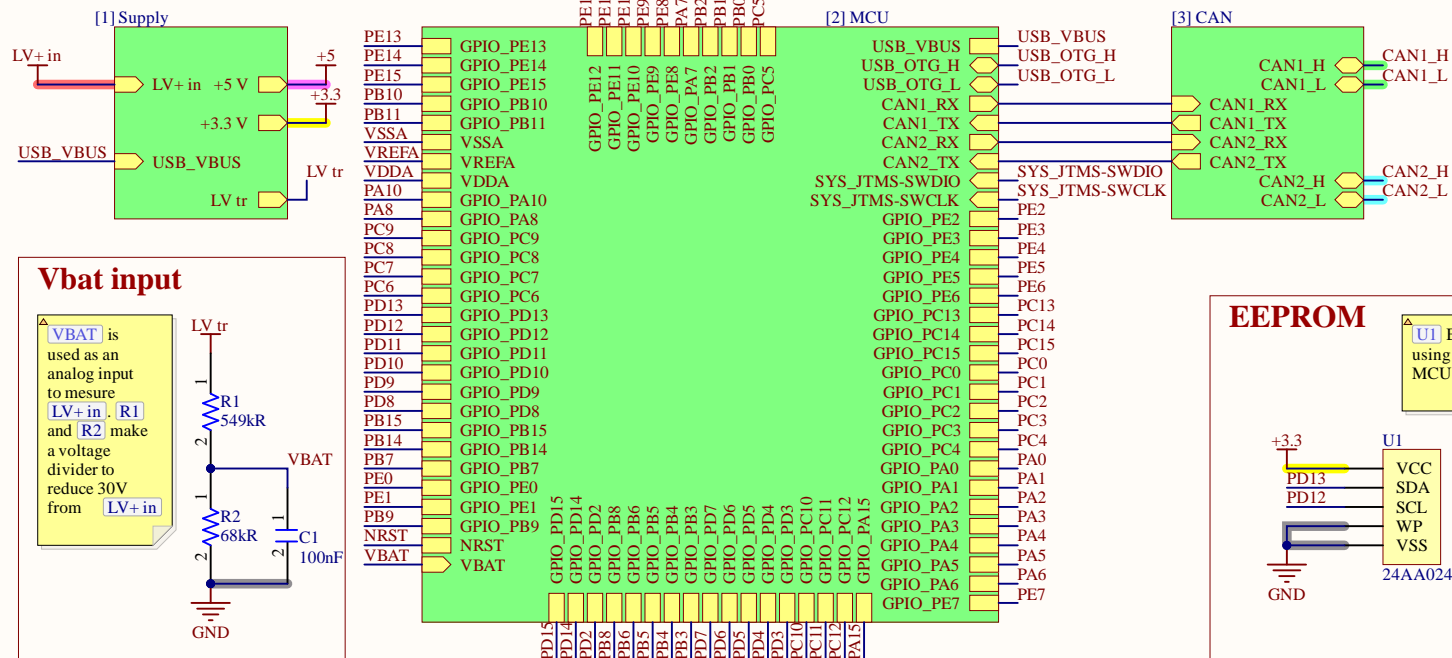


1

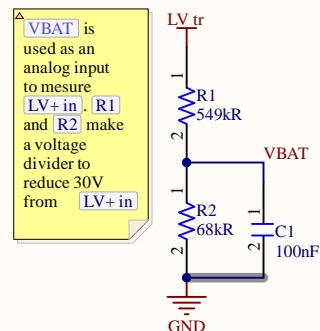
2

3

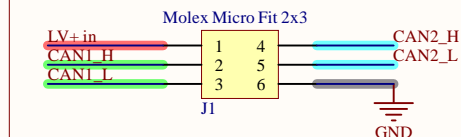
4



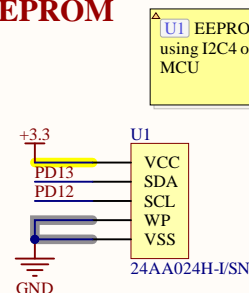
## Vbat input



## Supply&CAN connector

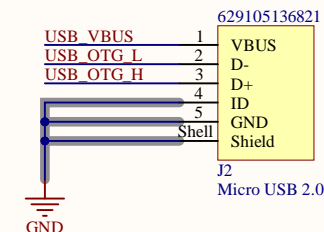


## EEPROM

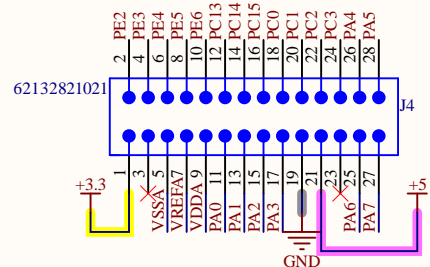


## USB connector

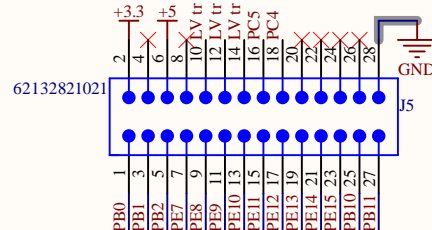
USB\_VBUS is used as a 5V input supply when board not supplied externally



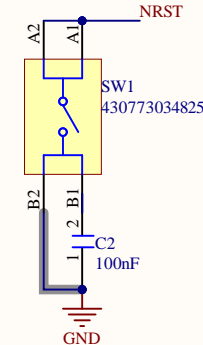
## Pin header 1



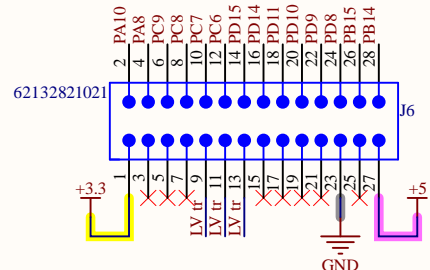
## Pin header 2



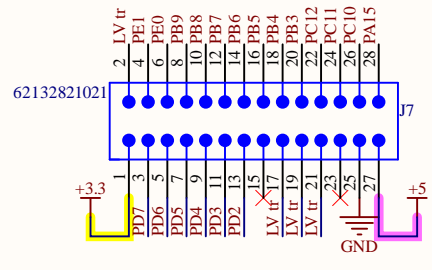
## Reset switch (NRST)



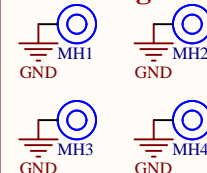
## Pin header 3



## Pin header 4



## Mounting holes



Company: e-Tech Racing		e-techracing.es	
Project: SHIELD		Variant: [No Variations]	
Size:	Page Contents:		Version: 1.0
-	ETRX_Shield.SchDoc		Department: Hardware
Author: Bernat Costa Cesari		Sheet 1 of 4	
Checked by: Andreu Senis		Date: 22/11/2023	

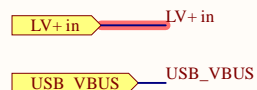
1

2

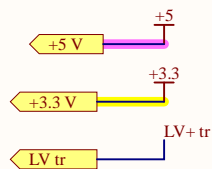
3

4

## Inputs

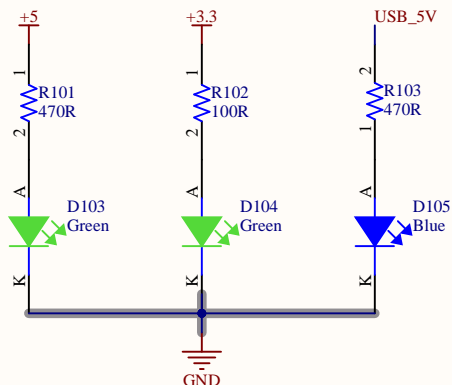


## Outputs

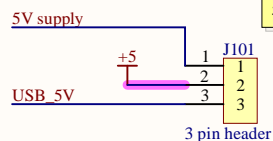


△ Pi filter composed with C102, C103 and L101 is calculated to be cutting all frequencies higher than 7340 Hz

## LEDs

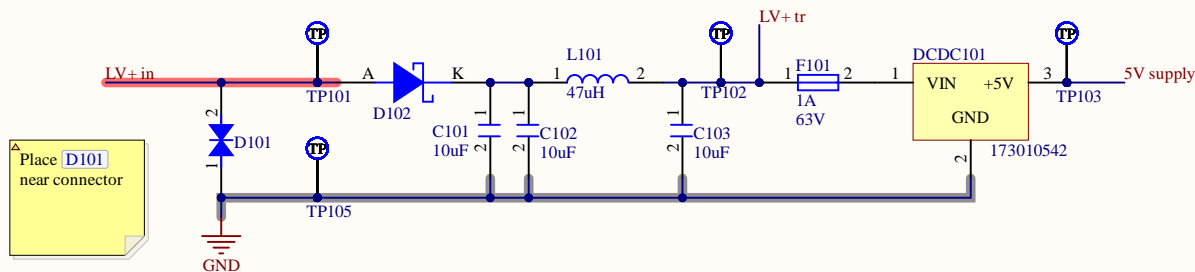


## Supply selection

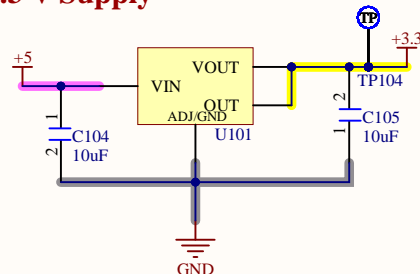


△ Supply selection via J101. Position 1 of the jumper shortcircuits 5V from DCDC to 5V board bus. Position 2 shortcircuits the USB supply to the 5V bus.

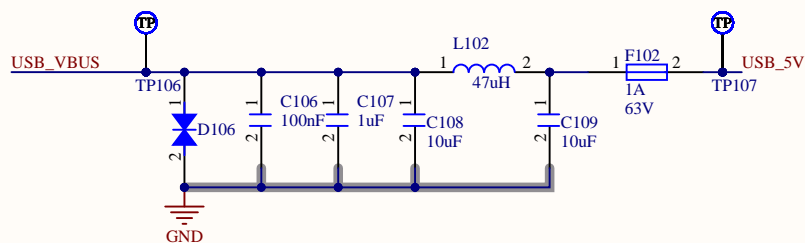
## 5 V Supply



## 3.3 V Supply



## USB Supply




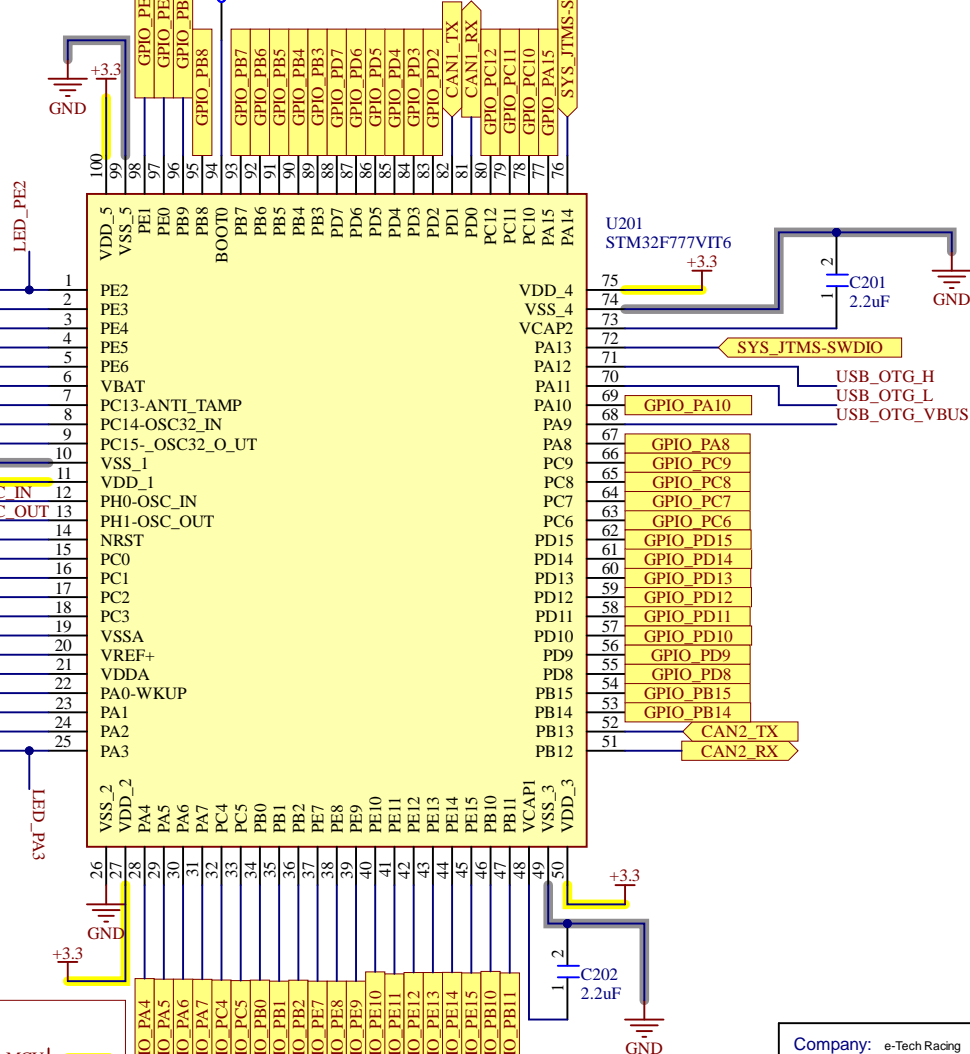
Company: e-Tech Racing		e-techracing.es	
Project: SHIELD		Variant: [No Variations]	
Size: -	Page Contents: [1] Supply.SchDoc	Version: 1.0	Department: Hardware
Author: Bernat Costa Cesari      bernat.costa.cesari@estudiantat.upon.es		Sheet 2 of 4	
Checked by: Andreu Senis		Date: 22/11/2023	

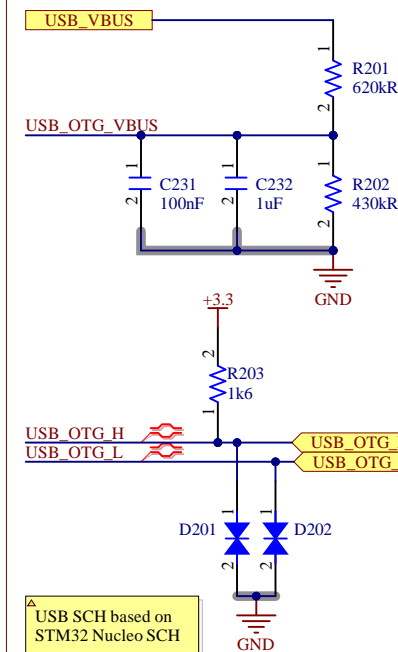
Diagram showing the SW201 switch connected to +3.3V and GND. A callout box indicates "Boot mode selection with SW201".




XTAL201 is a 20MHz HSE base for the internal PLL

Place VDD\_MCU decoupling capacitors near MCU

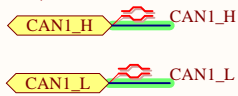
**USB\_OTG\_VBUS** acts as a digital input which can be used to detect USB presence



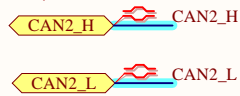
USB SCH based on STM32 Nucleo SCH

Company: e-Tech Racing		e-techracing.es		
Project: SHIELD		Variant: [No Variations]		
Size:	Page Contents:		Version:	1.0
-	[2] MCU, SchDoc		Department:	Hardware
Author: Bernat Costa Cesari			Sheet 3 of 4	
Checked by: Andreu Senis			Date: 22/11/2023	

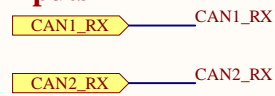
## CAN 1



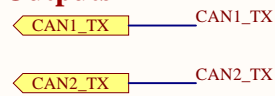
## CAN 2



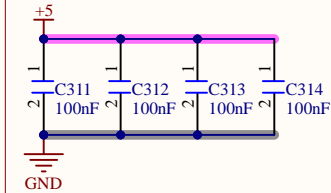
## Inputs



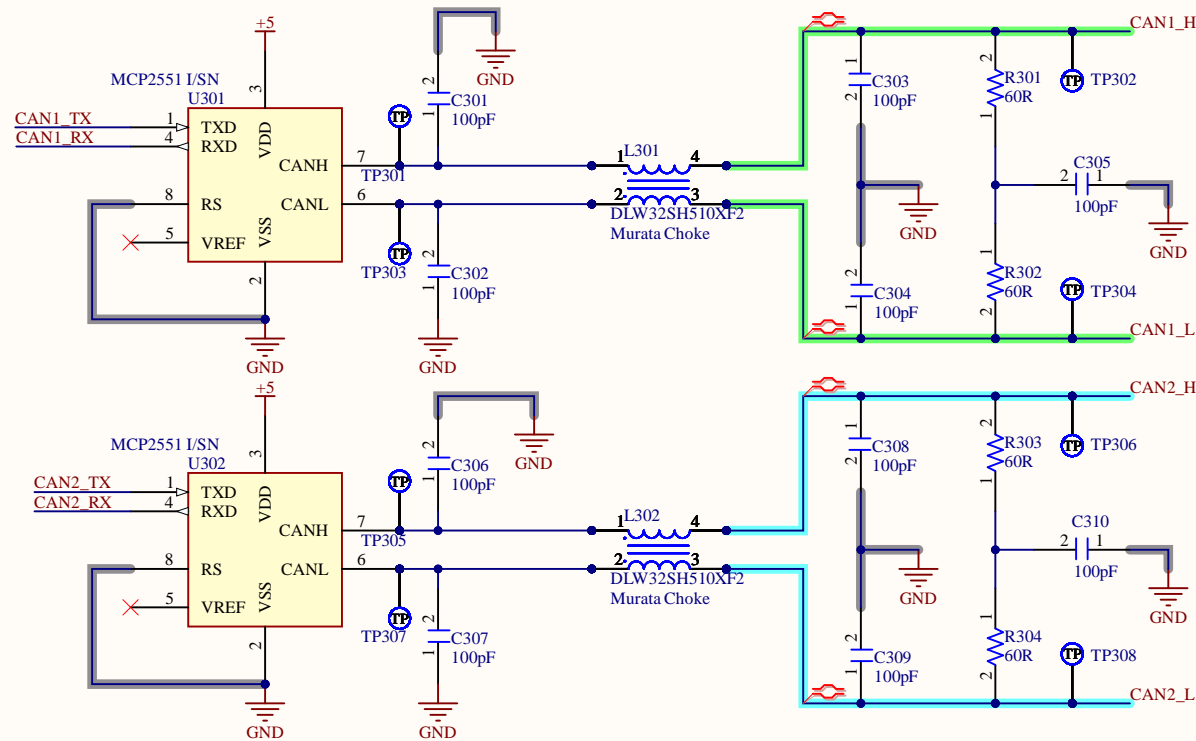
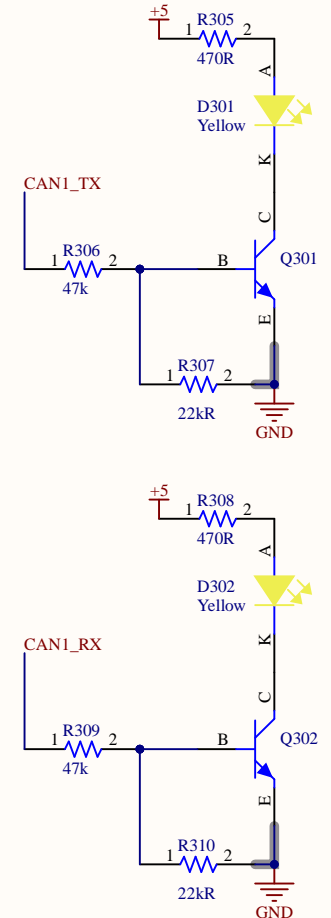
## Outputs




## CAN decoupling

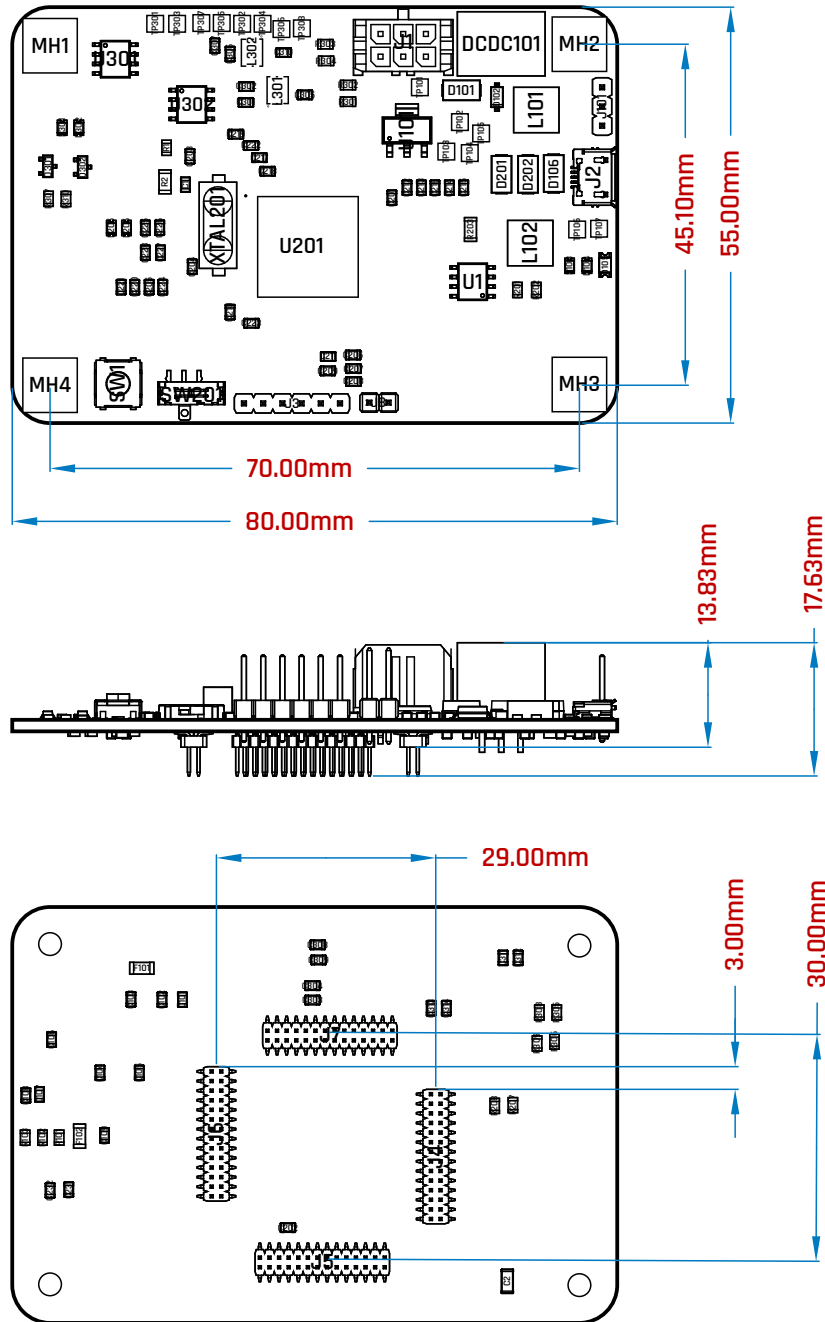


## CAN LEDs



Company: e-Tech Racing		e-techracing.es		
Project: SHIELD		Variant: [No Variations]		
Size: -	Page Contents: [3] CAN_Sch.Doc		Version: 1.0	Department: Hardware
Author: Bernat Costa Cesari      bernat.costa.cesari@estudiantat.upc.edu			Sheet 4 of 4	
Checked by: Andreu Senis			Date: 22/11/2023	

# ETR SHIELD



Line #	Designator	Name	Quantity
	C1, C106, C205, C206, C207, C208, C209, C210, C211, C212, C213, C214, C215, C216, C217, C218, C219, C220, C221, C222, C223, C224, C226, C228, C231, C311, C312, C313, C314	885012207098	29
	C2	885012208058	1
	C101, C102, C103, C108, C109	10uF	5
	C104, C105	885012107014	2
	C107, C225, C227, C232	885012207103	4
	C201, C202	2.2uF	2
	C203, C204	885012007052	2
	C301, C302, C303, C304, C305, C306, C307, C308, C309, C310	885012007057	10
	D101	824501261	1
	D102	MBR0530	1
	D103, D104	150080GS75000	2
	D105	150120BS75000	1
	D106	824501131	1
	D201, D202	824501600	2
	D205, D206	150080RS75000	2
	D301, D302	150080YS75000	2
	DCDC101	173010542	1
	F101, F102	0437001.WRA	2
	J1	Molex Micro Fit 2x3	1
	J2	629105136821	1
	J3	6 pin header	1
	J4, J5, J6, J7	62132821021	4
	J8	61300211121	1
	J101	3 pin header	1
	L101, L102	47uH	2
	L301, L302	DLW32SH510XF2	2
	MH1, MH2, MH3, MH4	Mounting_Hole_M3	4
	Q301, Q302	BC817-25LT1G	2
	R1	549kR	1
	R2	CR1206AFX-6802EAS	1
	R101, R103, R305, R308	CR0805-FX-4700GLF	4
	R102, R207, R208	CR0805-FX-1000ELF	3
	R201	620kR	1
	R202	430kR	1
	R203	CRCW12061K60FKEA	1
	R301, R302, R303, R304	R60-0805FTN	4
	R306, R309	47k	2
	R307, R310	22kR	2
	SW1	430773034825	1
	SW201	450405020524	1
	U1	24AA024H-I/SN	1
	U101	LM1117IMP-3.3/NOPB	1
	U201	STM32F77VIT6	1
	U301, U302	MCP2551 I/SN	2
	XTAL201	830028710	1

A

B

C

D

E

1

1

2

2

3

3

4

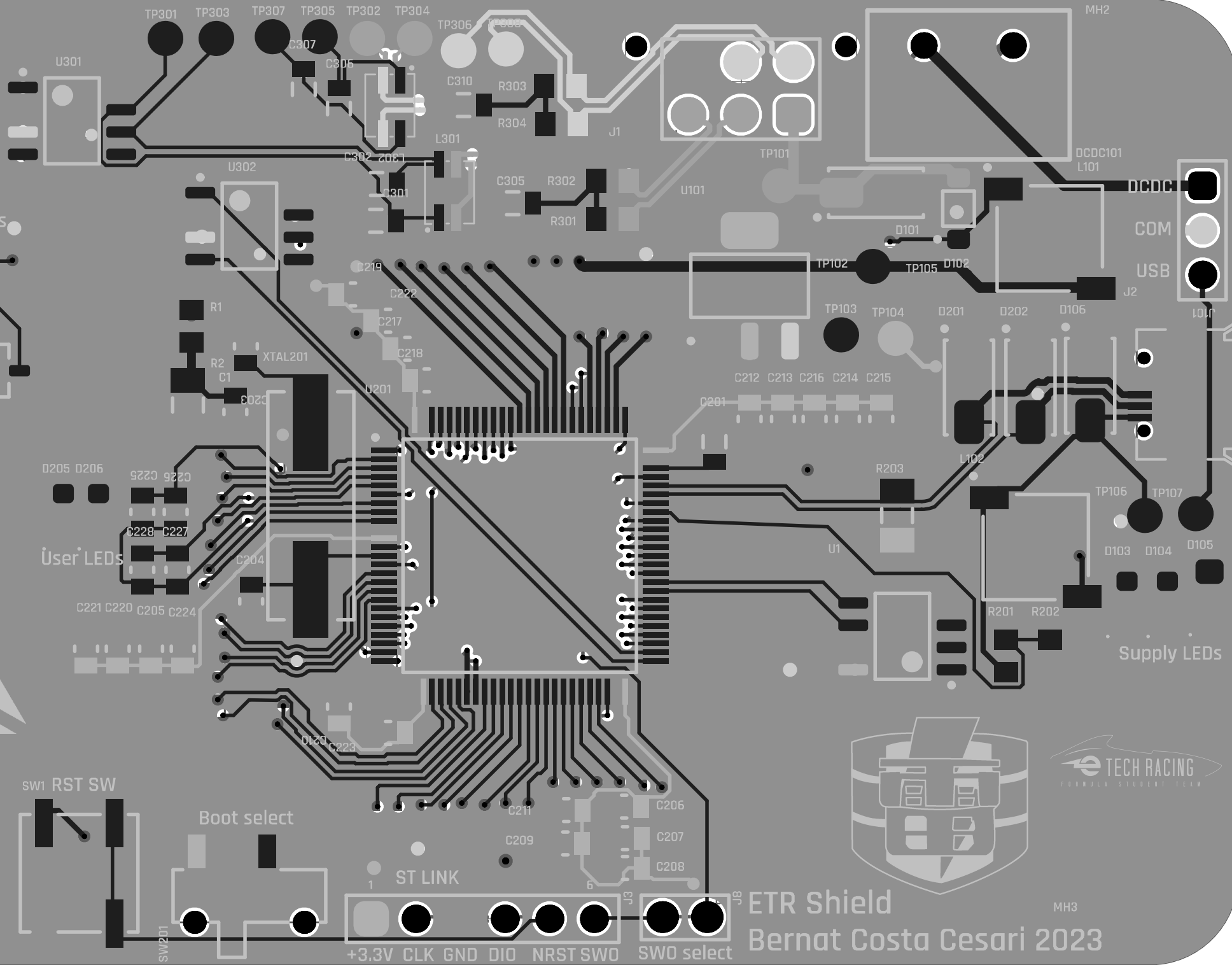
4

Layer Stack Legend

Material	Layer	Thickness	Dielectric Material	Type	Gerber
	Top Overlay			Legend	GTO
Surface Material	Top Solder	0.01mm	Solder Resist	Solder Mask	GTS
Copper	Top Layer	0.04mm		Signal	GTL
Prepreg		0.10mm	PP-006	Dielectric	
CF-004	GND	0.02mm		Signal	G1
Prepreg		0.10mm	PP-006	Dielectric	
		1.00mm	FR-4	Dielectric	
Prepreg		0.10mm	PP-006	Dielectric	
CF-004	PWR	0.02mm		Signal	G2
Prepreg		0.10mm	PP-006	Dielectric	
Copper	Bottom Layer	0.04mm		Signal	GBL
Surface Material	Bottom Solder	0.01mm	Solder Resist	Solder Mask	GBS
	Bottom Overlay			Legend	GBO
Total thickness: 1.53mm					

MH1

MH2



MH4

MH3

ETR Shield  
Bernat Costa Cesari 2023



TECH RACING  
FORMULA STUDENT TEAM