

REVISION: 01_1
VARIANT: NO VARIATIONS

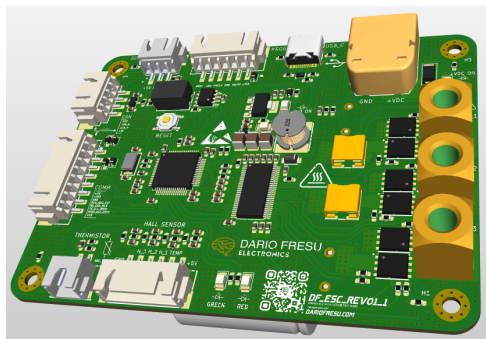
PAGE #	INDEX
1	BLOCK DIAGRAM
2	INPUT PROTECTION
3	STEP-DOWN
4	MCU
5	MOSFET DRIVER
6	MOSFETs
7	CAN
8	FILTERS
9	USB
10	MECHANICAL

RELEASED STATUS PROJECT:

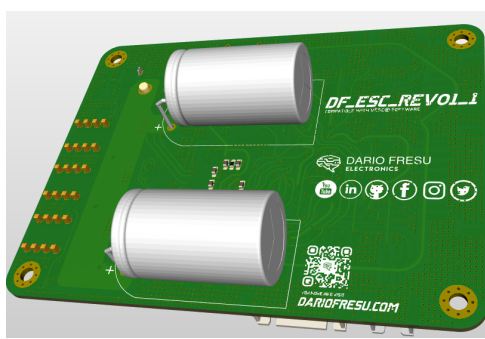
DRAFT

DATE: 2022-10-03

BOARD IMAGE FRONT

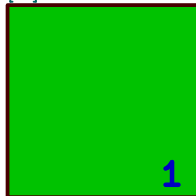


BOARD IMAGE BACK



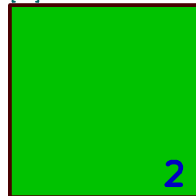
DF_ESC_rev01_1

[01] - BLOCK DIAGRAM



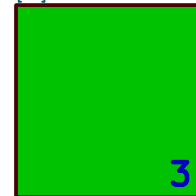
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[02] - INPUT PROTECTION



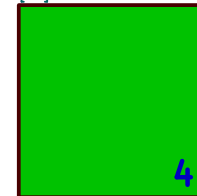
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[03] - STEP-DOWN



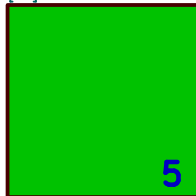
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[04] - MCU



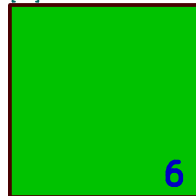
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[05] - MOSFET DRIVER



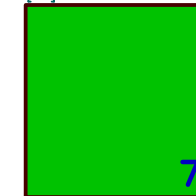
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[06] - MOSFETs



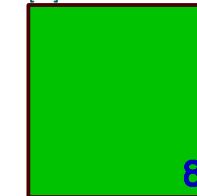
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[07] - CAN



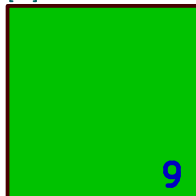
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[08] - FILTERS



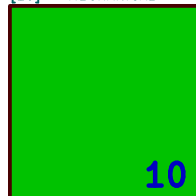
File: [08] - FILTERS.kicad_sch

[09] - USB



File: [09] - USB.kicad_sch

[10] - MECHANICAL



File: [10] - MECHANICAL.kicad_sch

Designer: Dario Fresu

Email: info@dariofresu.com

Secondary Email:

Website: dariofresu.com

Company: DF Electronics

Sheet:

File: DF_ESC_rev01_1.kicad_sch

Title: DF_ESC_rev01_1

Size: A4

Date: 2022-10-03

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Rev: 01_1

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[01] – BLOCK DIAGRAM

0 TO +60V

+VDC

PAGE 1

USB

PAGE 9

CAN

PAGE 7

HALL/ENCODER

PAGE 8

COM

PAGE 4

MCU

PAGE 4

MOSFET DRIVER

PAGE 5

MOSFETs

PAGE 6

MOTOR



+3V3

+5V

STEP-DOWN
3V3

PAGE 3

TEMP_SENSOR

PAGE 4

SERVO

PAGE 4

Designer: Dario Fresu

Email: info@dariofresu.com

Secondary Email:

Website: dariofresu.com

Company: DF Electronics

Sheet: [01] – BLOCK DIAGRAM

File: [01] – BLOCK DIAGRAM.kicad_sch

Title: DF_ESC_rev01_1

Size: A4 Date: 2022-10-03

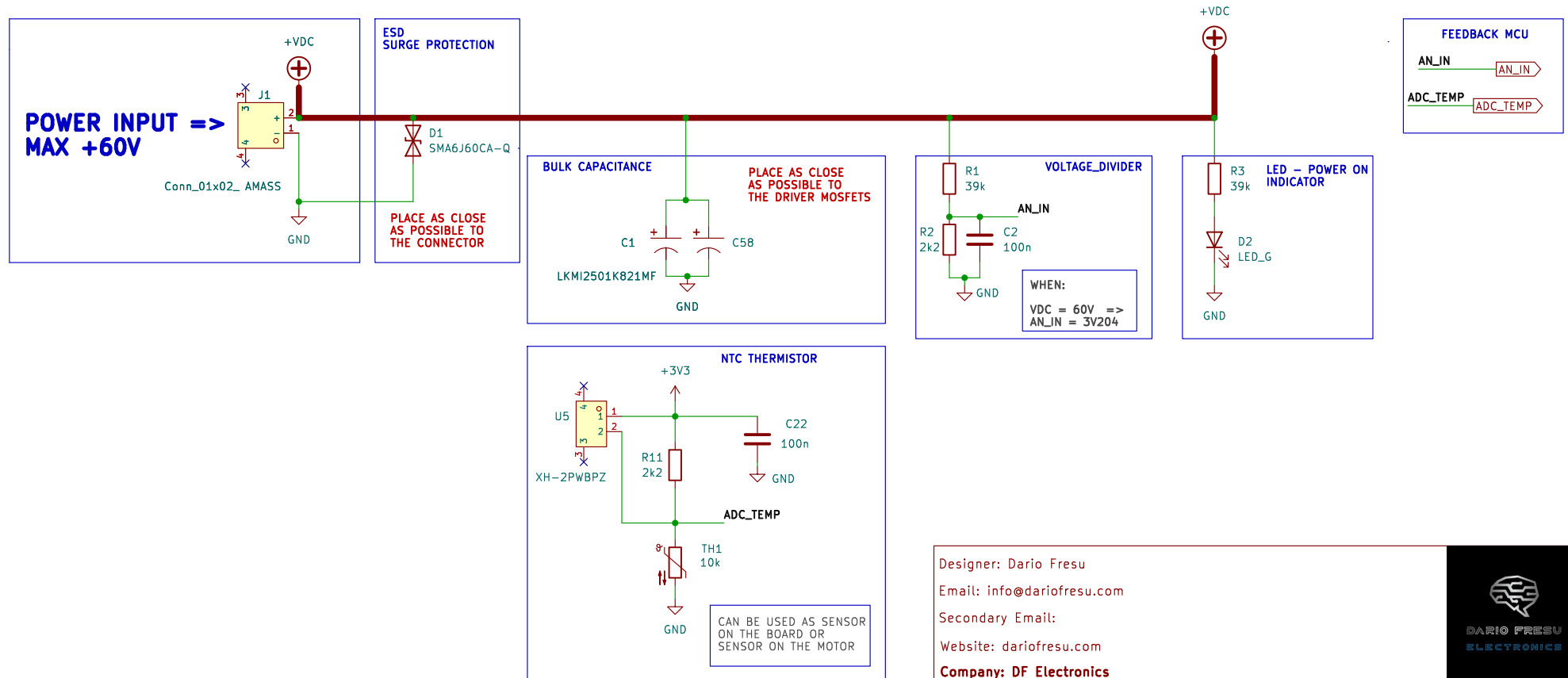
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[02] – INPUT PROTECTION



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Email: info@dariofresu.com
Secondary Email:
Website: dariofresu.com

Company: DF Electronics

Sheet: [02] – INPUT PROTECTION
File: [02] – INPUT PROTECTION.kicad_sch

Title: DF_ESC_rev01_1

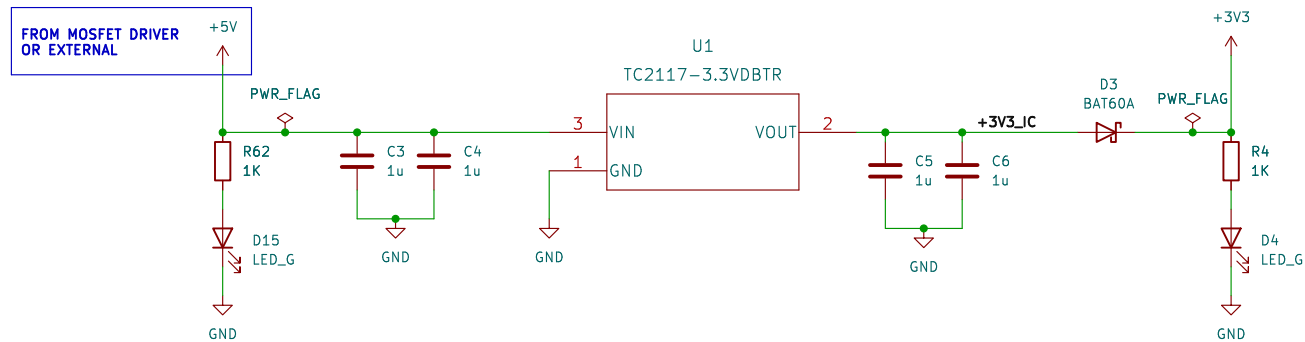
Size: A4 Date: 2022-10-03
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Rev: 01_1
Id: 02/11

[03] – STEP-DOWN



Designer: Dario Fresu
Email: info@dariofresu.com
Secondary Email:
Website: dariofresu.com

Company: DF Electronics

Sheet: [03] – STEP-DOWN
File: [03] – STEP-DOWN.kicad_sch

Title: DF_ESC_rev01_1

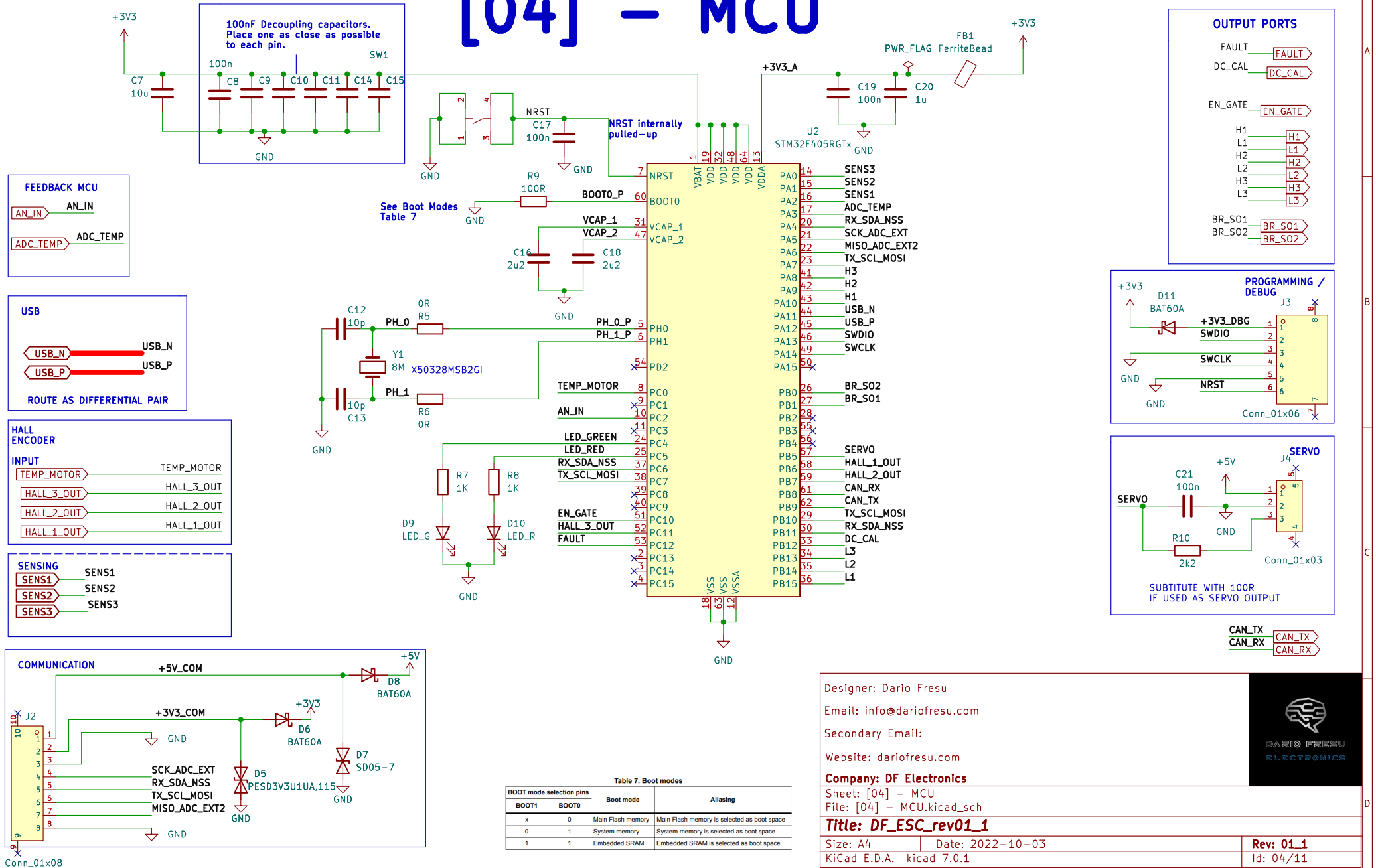
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Id: 03/11

[04] – MCU



Designer: Dario Fresu
Email: info@dariofresu.com
Secondary Email:
Website: dariofresu.com

Company: DF Electronics

Sheet: [04] – MCU
File: [04] – MCU.kicad_sch

Title: DF_ESC_rev01_1

Size: A4 Date: 2022-10-03

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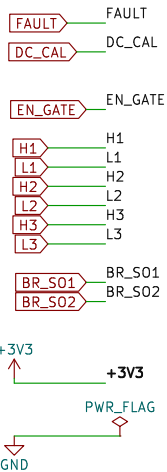
DARIO FRESU
ELECTRONICS

Rev: 01_1

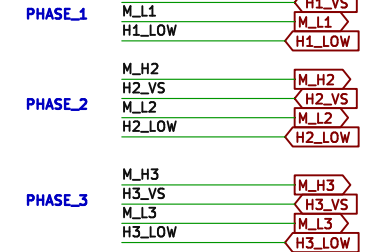
Id: 04/11

[05] – MOSFET DRIVER

INPUT PORTS



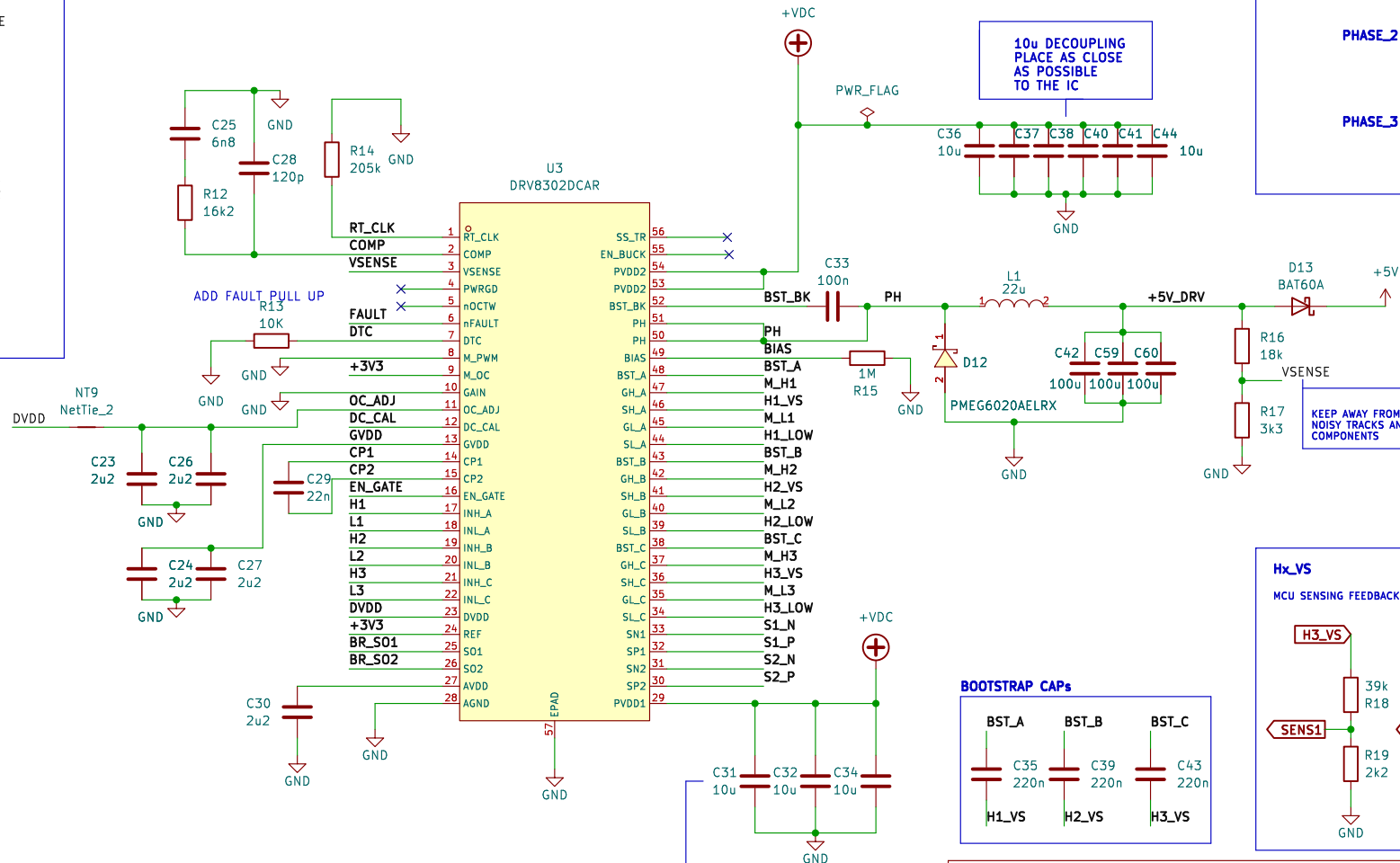
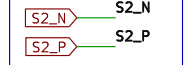
OUTPUT PORTS



SENSE 1 – PHASE 1

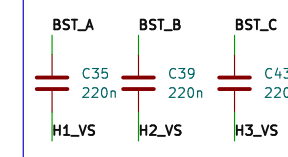


SENSE 2 – PHASE 2



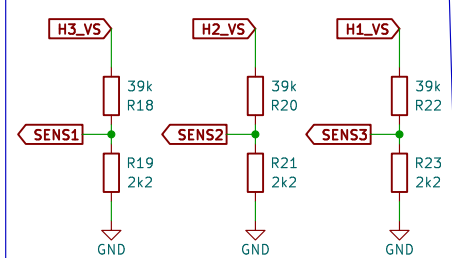
BULK CAPACITANCE
KEEP AS CLOSE AS POSSIBLE TO THE IC
AND TO THE DRIVER INPUT LOOP

BOOTSTRAP CAPs



Hx_VS

MCU SENSING FEEDBACK FOR EACH PHASE



Designer: Dario Fresu

Email: info@dariofresu.com

Secondary Email:

Website: dariofresu.com

Company: DF Electronics

Sheet: [05] – MOSFET DRIVER

File: [05] – MOSFET DRIVER.kicad_sch

Title: DF_ESC_rev01_1

Size: A4 Date: 2022-10-03

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Rev: 01_1

Id: 05/11



[06] – MOSFETs

Q_CONTROL

M_H1	M_H1
M_L1	M_L1
M_H2	M_H2
M_L2	M_L2
M_H3	M_H3
M_L3	M_L3

Q_SOURCES

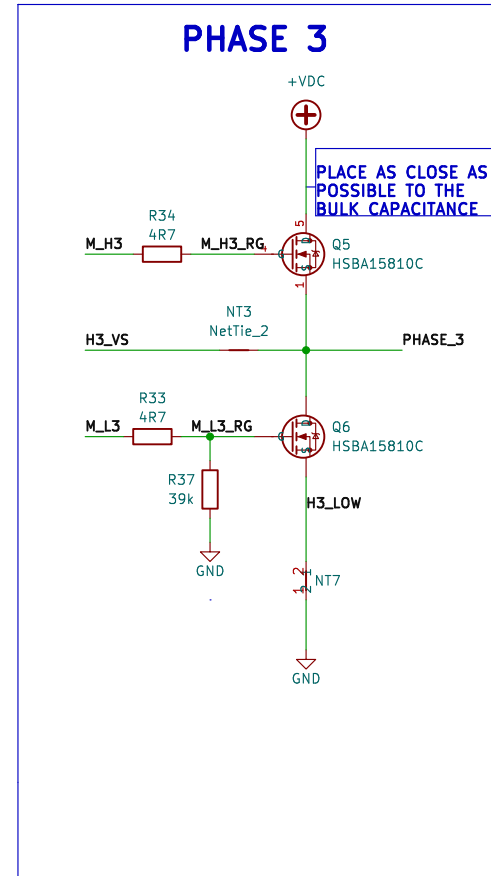
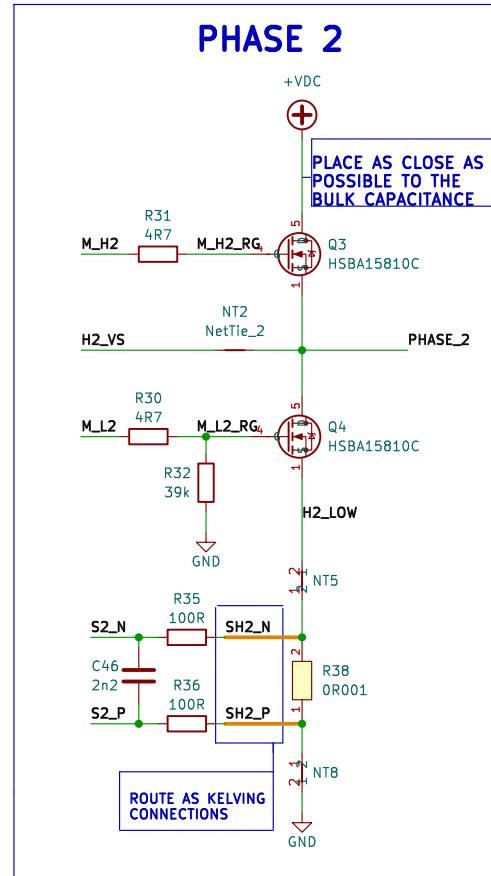
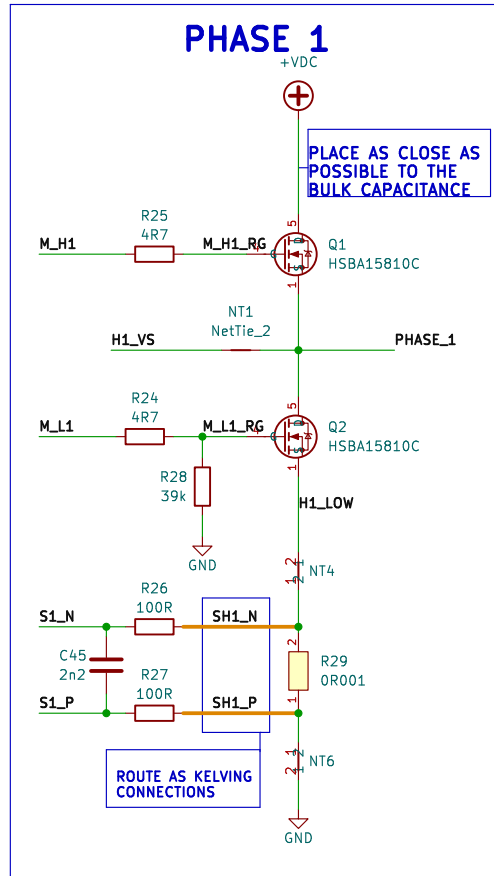
H1_LOW	H1_LOW
H2_LOW	H2_LOW
H3_LOW	H3_LOW

SENSE 1

S1_N	S1_N
S1_P	S1_P

SENSE 2

S2_N	S2_N
S2_P	S2_P

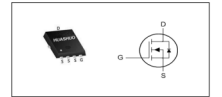


HSBA15810C

N-Ch 100V Fast Switching MOSFETs
Product Summary

V _{DS}	100	V
R _{DS(on)} typ	3.7	mΩ
I _D	100	A

PRPAK5 Pin Configuration



OUTPUT PHASE 1

PHASE_1 1 J5 Conn_01x01

OUTPUT PHASE 2

PHASE_2 1 J6 Conn_01x01

OUTPUT PHASE 3

PHASE_3 1 J7 Conn_01x01

Hx_VS

H1_VS	H1_VS
H2_VS	H2_VS
H3_VS	H3_VS

MCU SENSING
FEEDBACK
FOR EACH PHASE

Designer: Dario Fresu

Email: info@dariofresu.com

Secondary Email:

Website: dariofresu.com

Company: DF Electronics

Sheet: [06] – MOSFETs

File: [06] – MOSFETs.kicad_sch

Title: DF_ESC_rev01_1

Size: A4 Date: 2022-10-03

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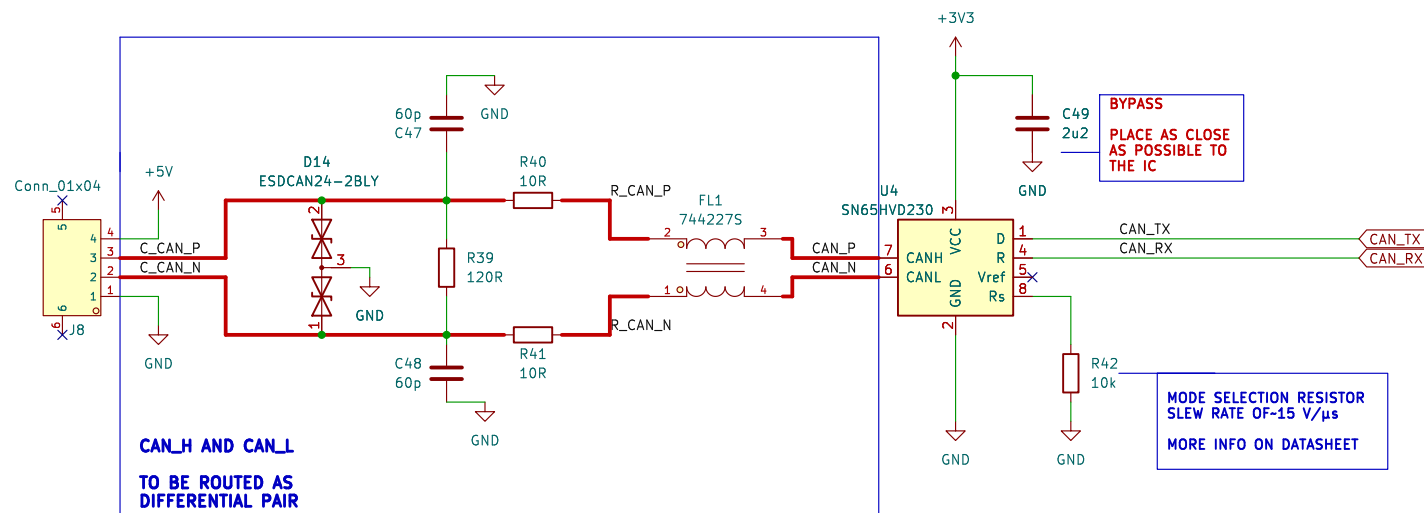
Rev: 01_1

Id: 06/11

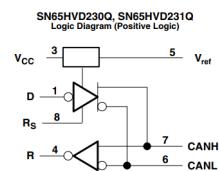


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[07] – CAN



LOGIC DIAGRAM



Designer: Dario Fresu

Email: info@dariofresu.com

Secondary Email:

Website: dariofresu.com

Company: DF Electronics

Sheet: [07] – CAN

File: [07] – CAN.kicad_sch

Title: DF_ESC_rev01_1

Size: A4 Date: 2022-10-03

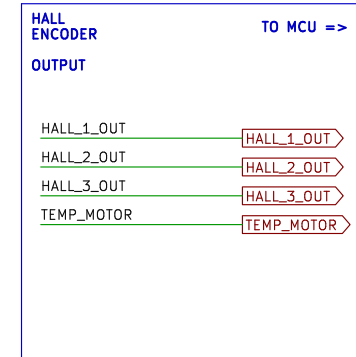
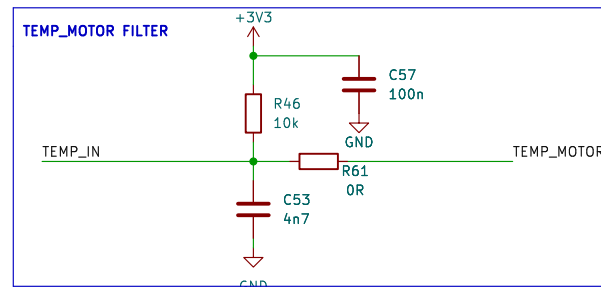
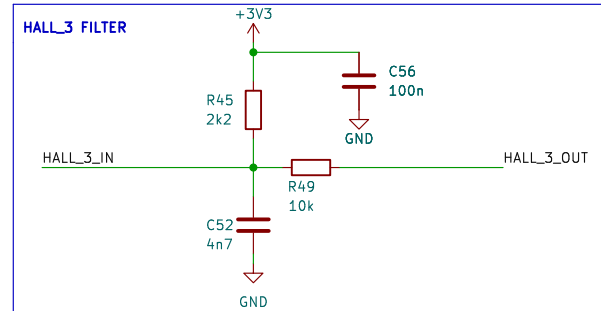
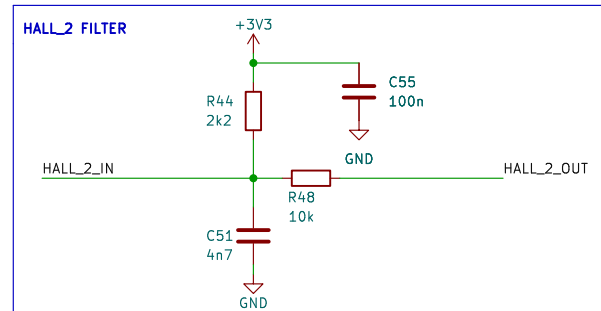
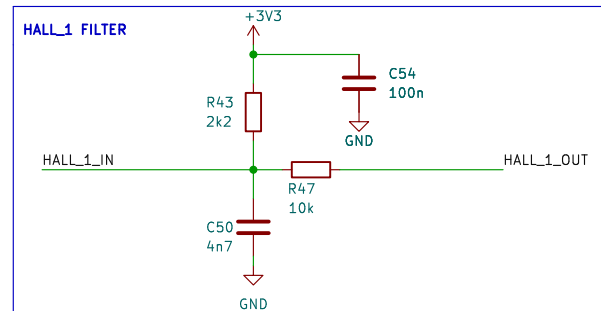
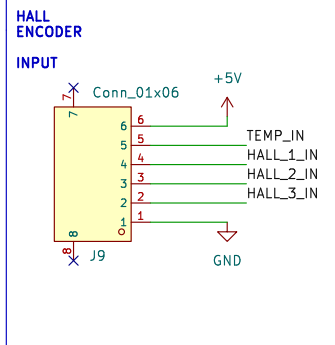
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Rev: 01_1

Id: 07/11

[08] – FILTERS



Designer: Dario Fresu

Email: info@dariofresu.com

Secondary Email:

Website: dariofresu.com

Company: DF Electronics

Sheet: [08] – FILTERS

File: [08] – FILTERS.kicad_sch

Title: DF_ESC_rev01_1

Size: A4 Date: 2022-10-03

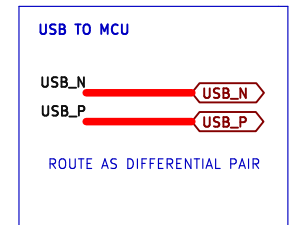
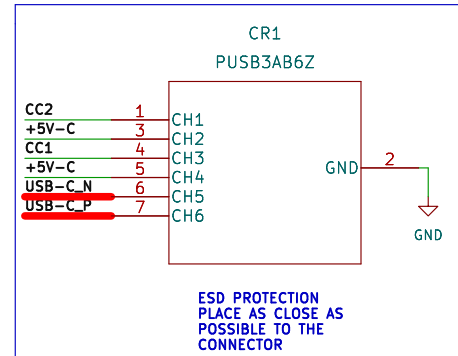
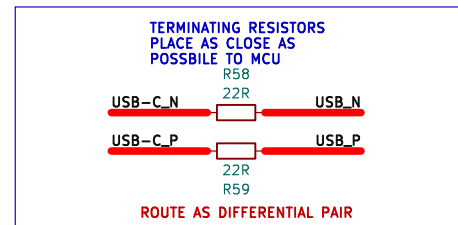
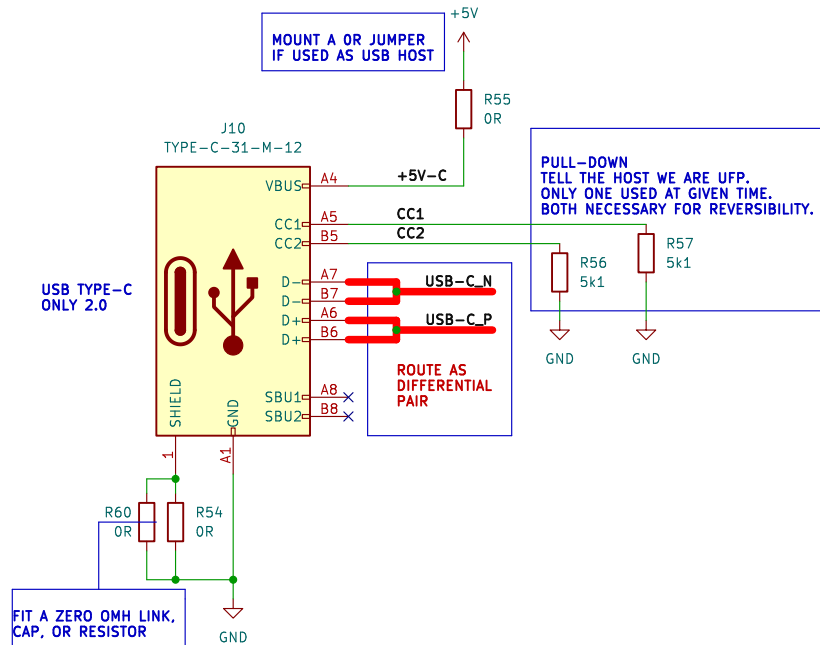
KiCad E.D.A. kicad 7.0.1



Rev: 01_1

Id: 08/11

[09] – USB



Designer: Dario Fresu
Email: info@dariofresu.com
Secondary Email:
Website: dariofresu.com

Company: DF Electronics

Sheet: [09] – USB
File: [09] – USB.kicad_sch

Title: DF_ESC_rev01_1

Size: A4 Date: 2022-10-03

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Rev: 01_1

Id: 09/11

[10] – MECHANICAL

LOGOS

LOG01
DF_LOGO

LOG02
DF_LOGO_NO_SLK

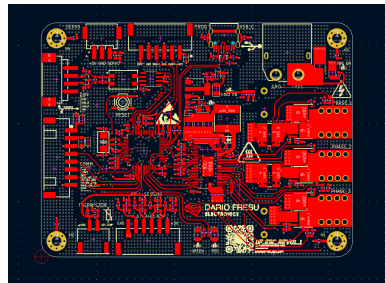
QR1
DF_QR_CODE

DF_LOGO

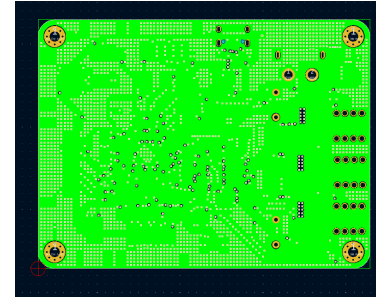
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DF_QR_CODE

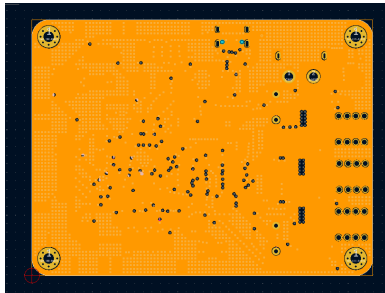
L1



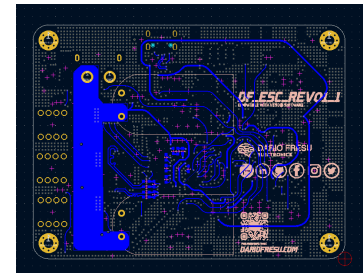
L2



L3



L4



LABELS

BOARD NAME AND REVISION

M.DATE

NOTES

B_NAME1
DF_ESC_REV01_1

M_DATE1
M_DATE

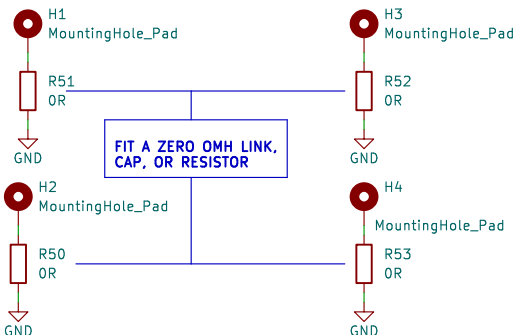
NOTES1
NOTES

BOARD NAME

M_DATE

NOTES

MOUNTING HOLES



PCB

PCB1
PCB

PCB

MODIFICATION FROM VESC 4.11:

- THERMISTOR MOVED TO LOWER LEG OF THE ADC PIN
- BOOT PIN PULLED-DOWN TO GND
- CHANGED BULK CAPACITANCE
- CHANGED PHASE SENSE RRESISTORS
- CHANGED NETS SENSE PHASES TO DIFFERENTIAL PAIRS
- INVERTED TX AND RX CONNECTOR PINS

IMPORTANT!!
COMPATIBLE VESC FIRMWARE 5.20
OTHER VERSIONS MIGHT DAMAGE THE HARDWARE!!

Designer: Dario Fresu

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Secondary Email:

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Company: DF Electronics

Sheet: [10] – MECHANICAL

File: [10] – MECHANICAL.kicad_sch

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Size: A4 Date: 2022-10-03

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Rev: 01_1

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