野火_无刷直流电机驱动模块_原理图_V1.0

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东莞野火电子技术有限公司
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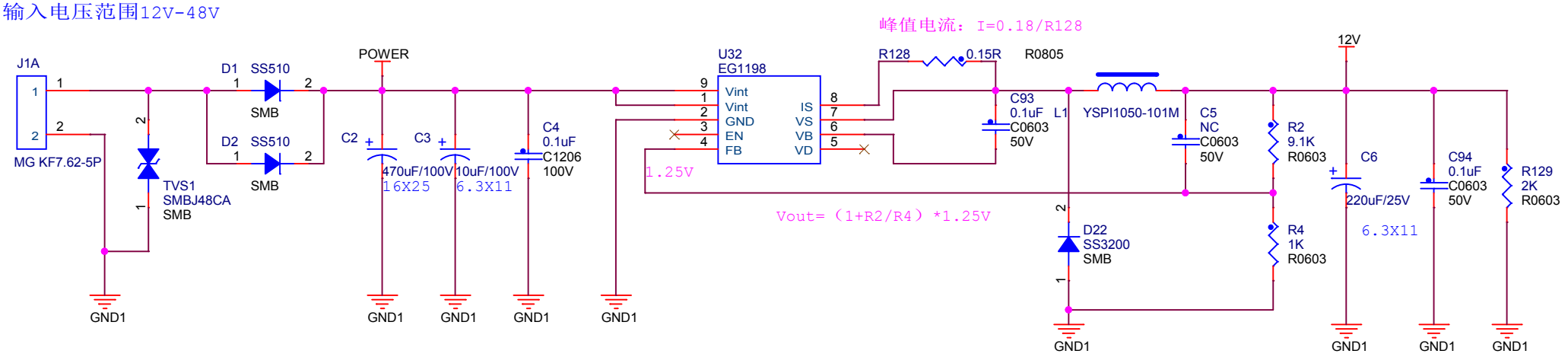
历史版本

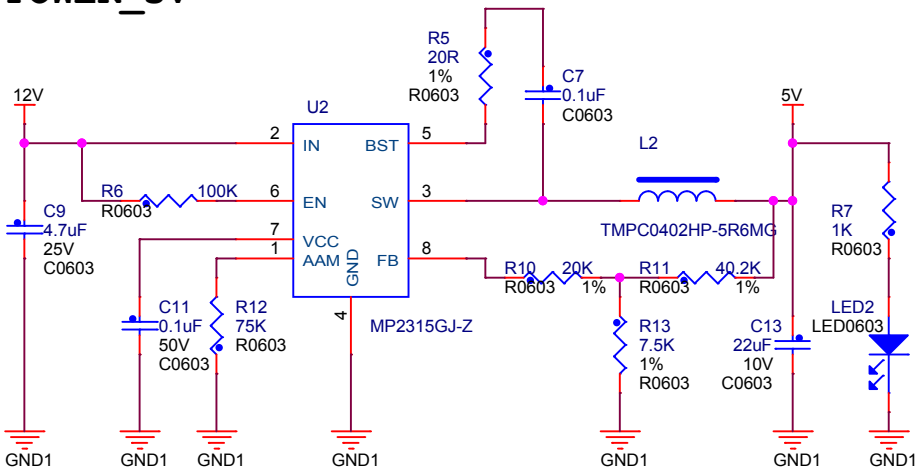
版本号	日期	设计	描述
V0.1	2020-09-04	xgh	初始版本
V1.0	2021-06-02	zwc	更改隔离运放型号
V1.1	2022-05-14	whp	修改12V电源芯片型号；修改过流保护电路

POWER_12V

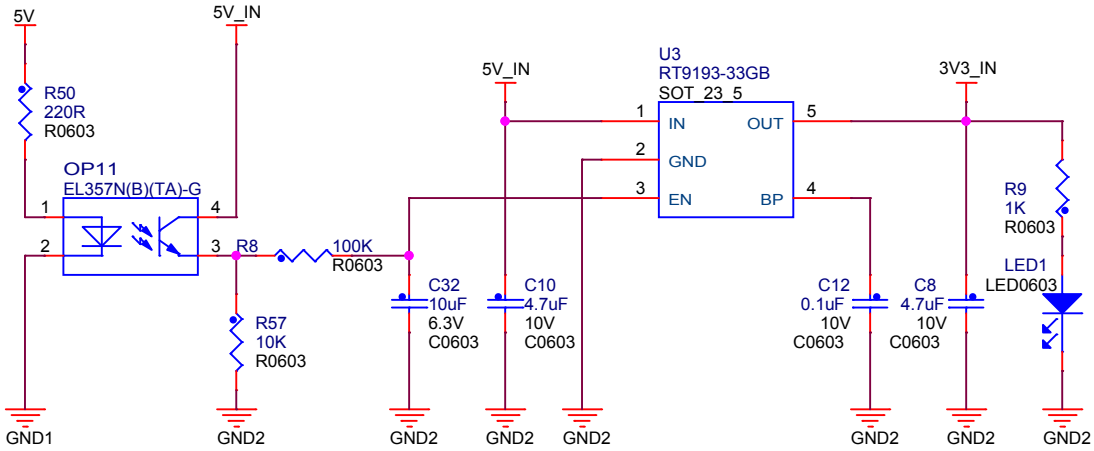
输入电压范围12V-48V



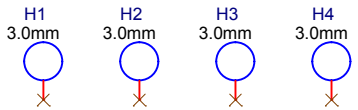
POWER_5V



POWER_3V3



定位孔



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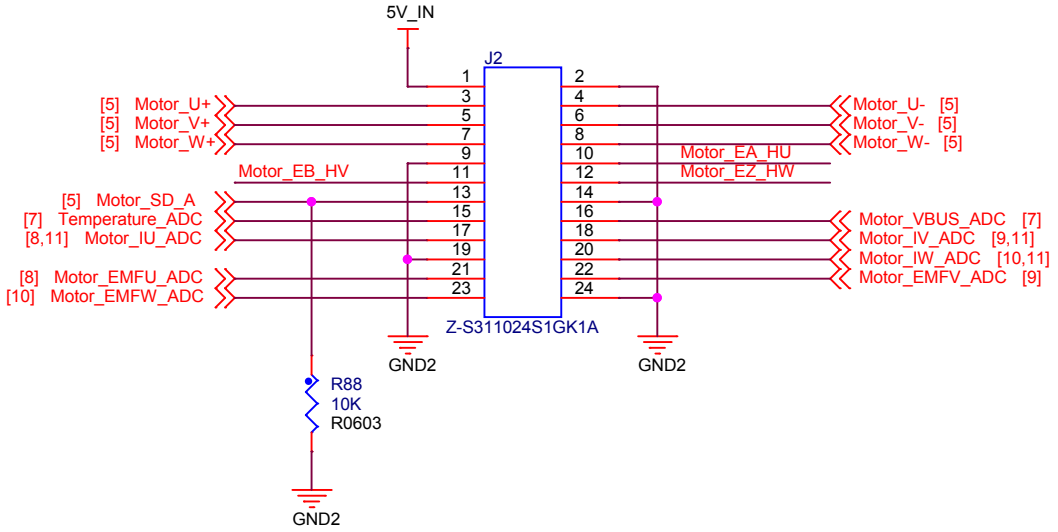
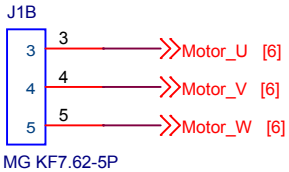
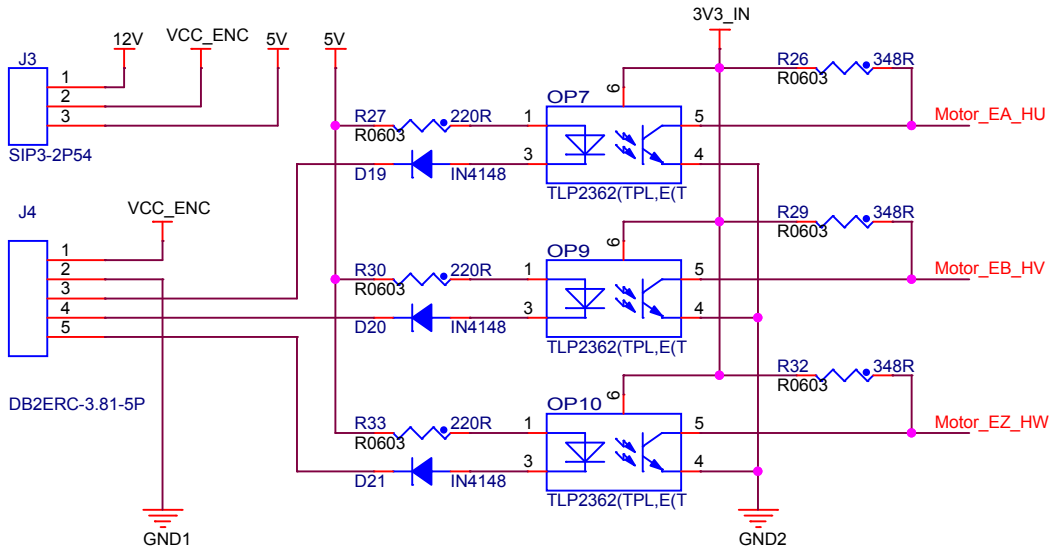
主板接口



电机接口



编码器接口



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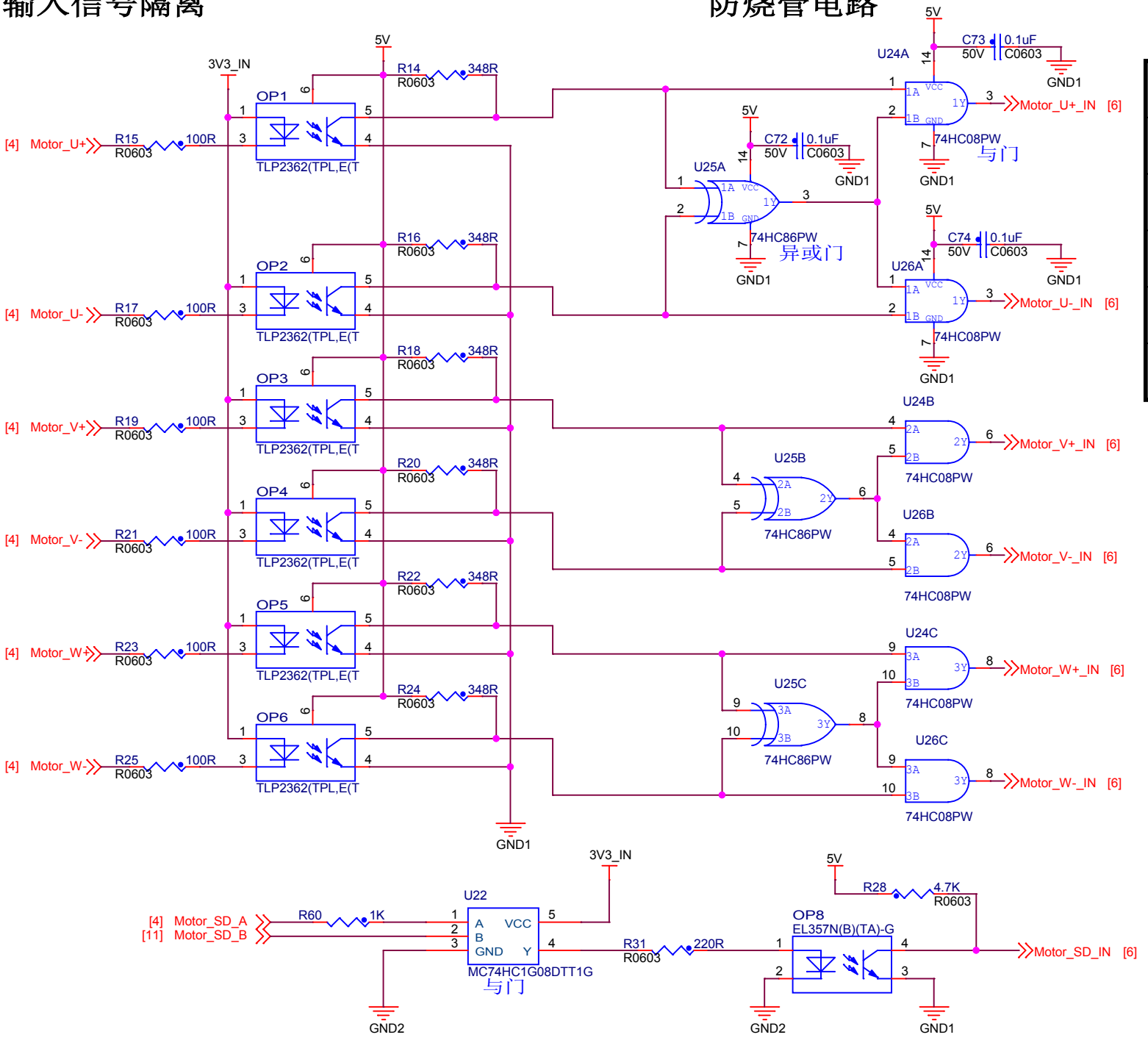
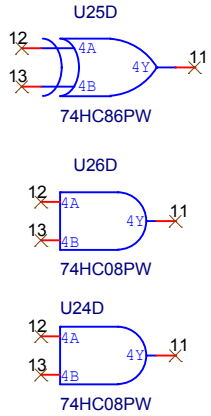
输入信号隔离

防烧管电路



防烧管电路真值表

输入		输出	
Motor_U+	Motor_U-	Motor_U+_IN	Motor_U-_IN
H	H	L	L
H	L	H	L
L	H	L	H
L	L	L	L



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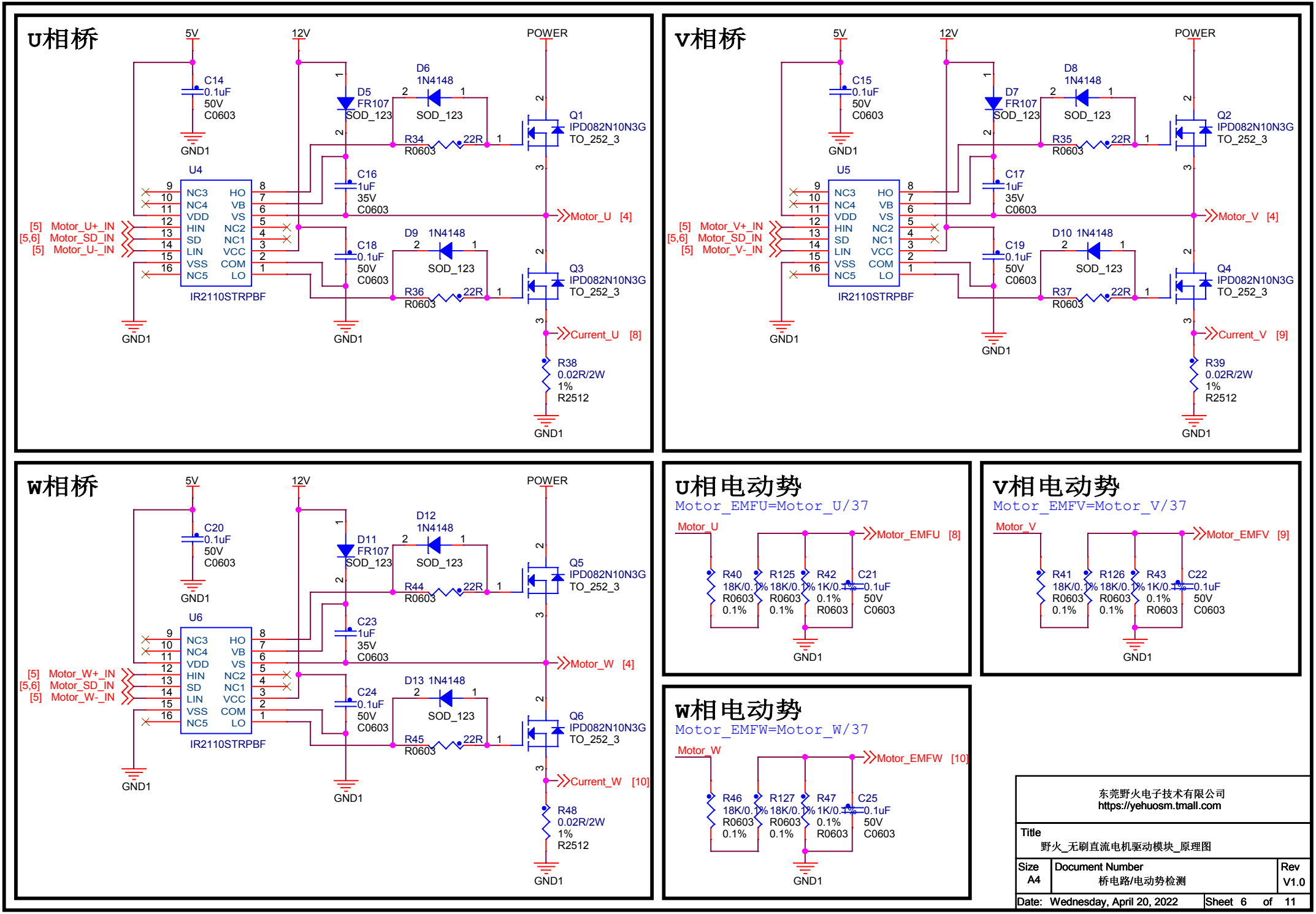
U相桥
5V
12V
POWER
C14
0.1uF
50V
C0603
GND1
U4
D5
FR107
SOD_123
D6
1N4148
SOD_123
R34
22R
R0603
Q1
IPD082N10N3G
TO_252_3
C16
1uF
35V
C0603
Motor_U [4]
[5] Motor_U+_IN
[5,6] Motor_SD_IN
[5] Motor_U-_IN
NC3 HO
NC4 VB
VDD VS
HIN NC2
SD NC1
LIN VCC
VSS COM
NC5 LO
IR2110STRPBF
C18
0.1uF
50V
C0603
D9 1N4148
SOD_123
R36
22R
R0603
Q3
IPD082N10N3G
TO_252_3
Current_U [8]
R38
0.02R/2W
1%
R2512
V相桥
C15
0.1uF
50V
C0603
D7
FR107
SOD_123
D8
1N4148
SOD_123
R35
22R
R0603
Q2
IPD082N10N3G
TO_252_3
U5
C17
1uF
35V
C0603
Motor_V [4]
[5] Motor_V+_IN
[5,6] Motor_SD_IN
[5] Motor_V-_IN
C19
0.1uF
50V
C0603
D10 1N4148
SOD_123
R37
22R
R0603
Q4
IPD082N10N3G
TO_252_3
Current_V [9]
R39
0.02R/2W
1%
R2512
W相桥
C20
0.1uF
50V
C0603
D11
FR107
SOD_123
D12
1N4148
SOD_123
R44
22R
R0603
Q5
IPD082N10N3G
TO_252_3
U6
C23
1uF
35V
C0603
Motor_W [4]
[5] Motor_W+_IN
[5,6] Motor_SD_IN
[5] Motor_W-_IN
C24
0.1uF
50V
C0603
D13 1N4148
SOD_123
R45
22R
R0603
Q6
IPD082N10N3G
TO_252_3
Current_W [10]
R48
0.02R/2W
1%
R2512
U相电动势
Motor_EMFU=Motor_U/37
Motor_U
Motor_EMFU [8]
R40
18K/0.1%
R0603
0.1%
R125
18K/0.1%
R0603
0.1%
R42
1K/0.1%
R0603
C21
0.1uF
50V
C0603
V相电动势
Motor_EMFV=Motor_V/37
Motor_V
Motor_EMFV [9]
R41
18K/0.1%
R0603
0.1%
R126
18K/0.1%
R0603
0.1%
R43
1K/0.1%
R0603
C22
0.1uF
50V
C0603
W相电动势
Motor_EMFW=Motor_W/37
Motor_W
Motor_EMFW [10]
R46
18K/0.1%
R0603
0.1%
R127
18K/0.1%
R0603
0.1%
R47
1K/0.1%
R0603
C25
0.1uF
50V
C0603
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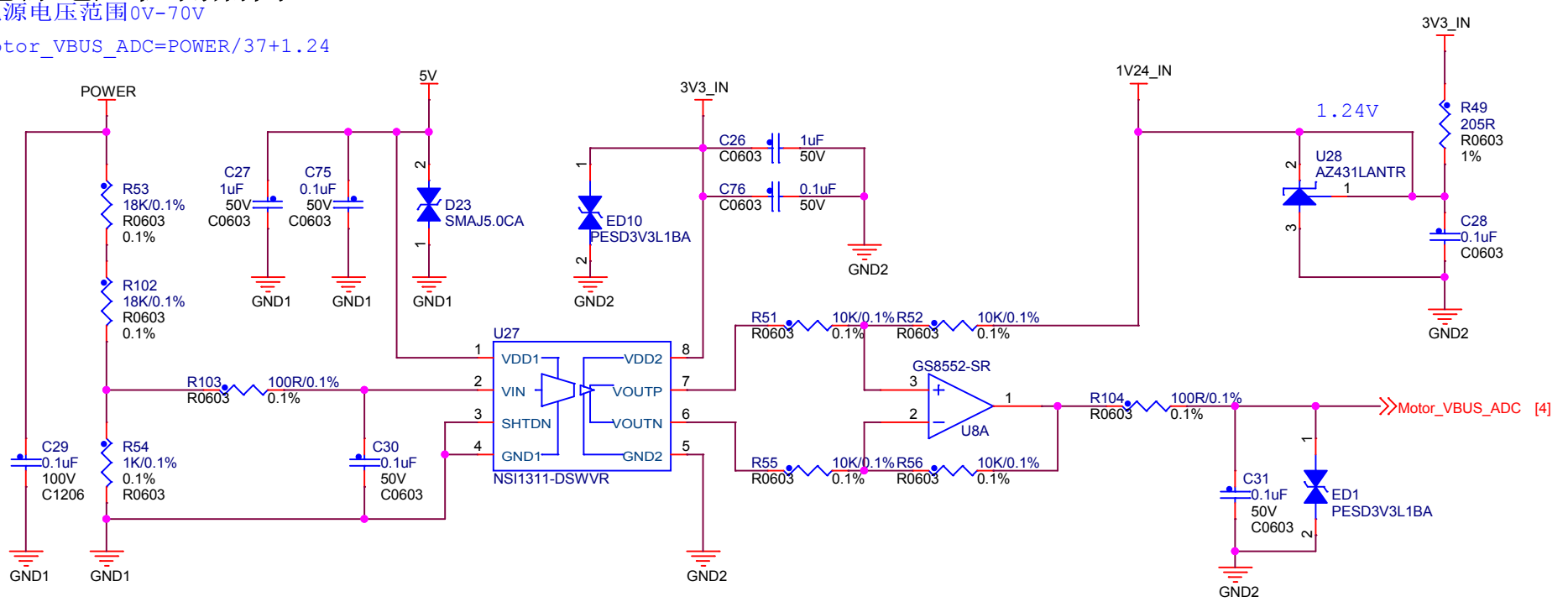
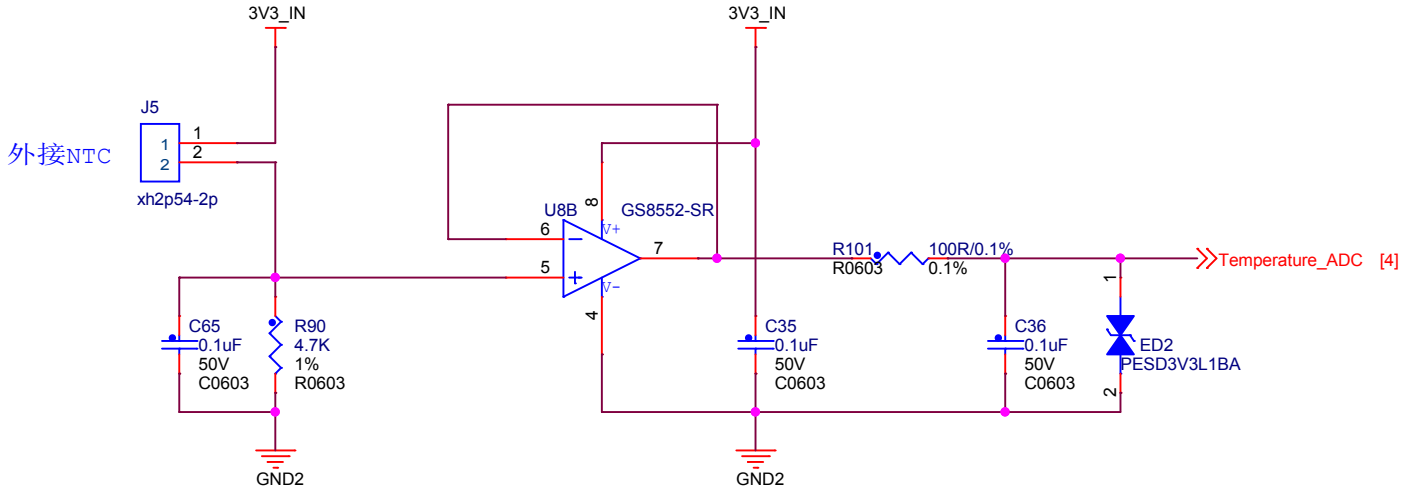
电源电压检测隔离

电源电压范围0V-70V

Motor_VBUS_ADC=POWER/37+1.24



温度检测



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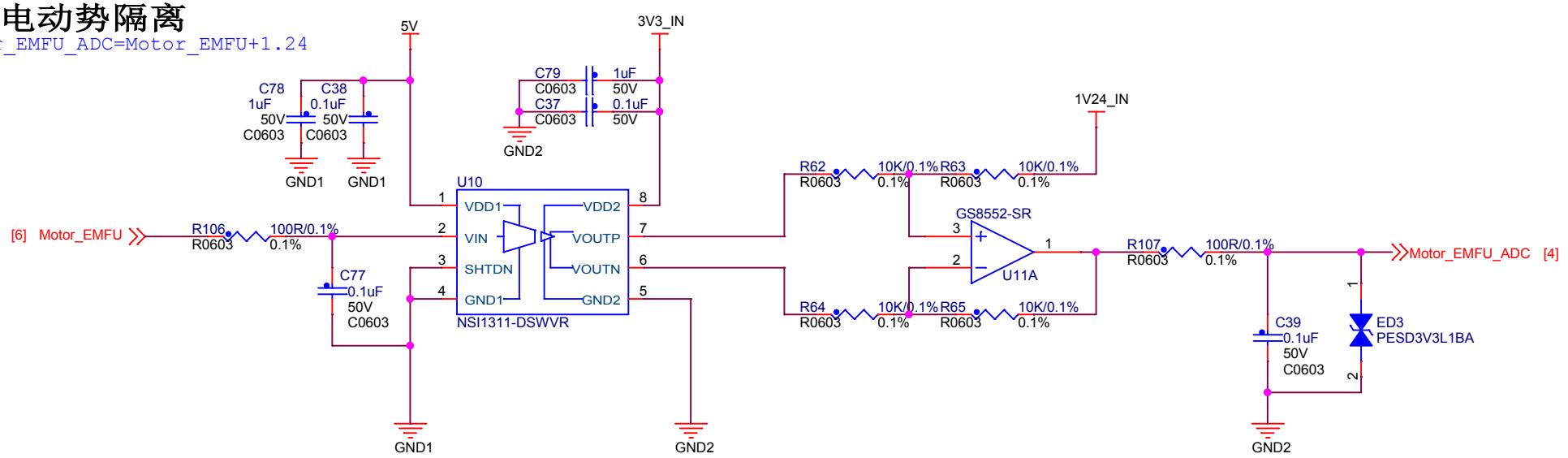
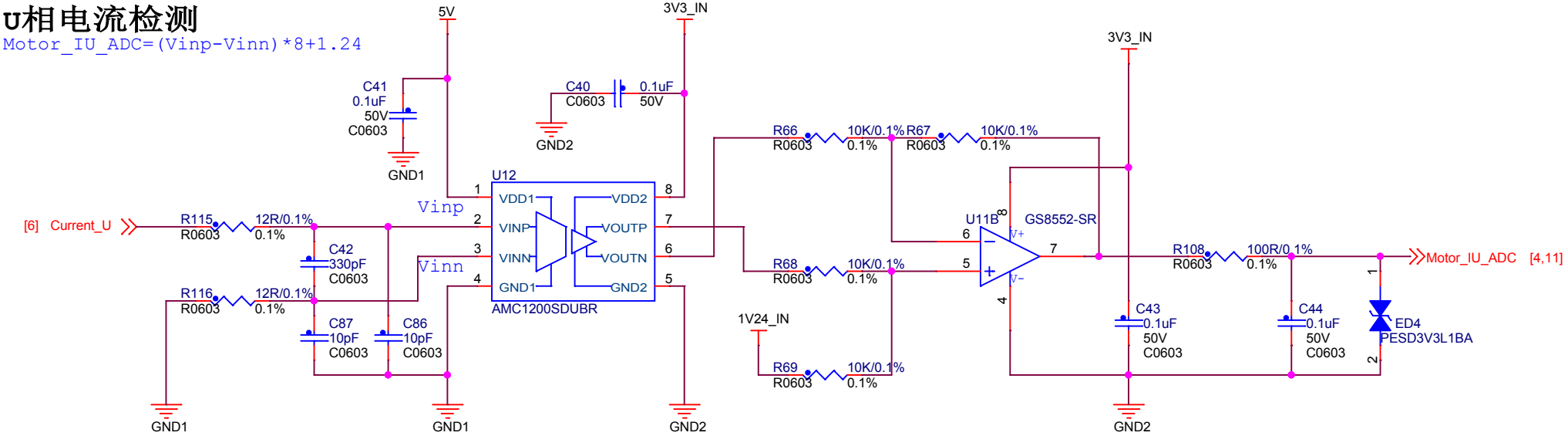
U相电动势隔离

Motor_EMFU_ADC=Motor_EMFU+1.24



U相电流检测

Motor_IU_ADC=(Vinp-Vinn)*8+1.24



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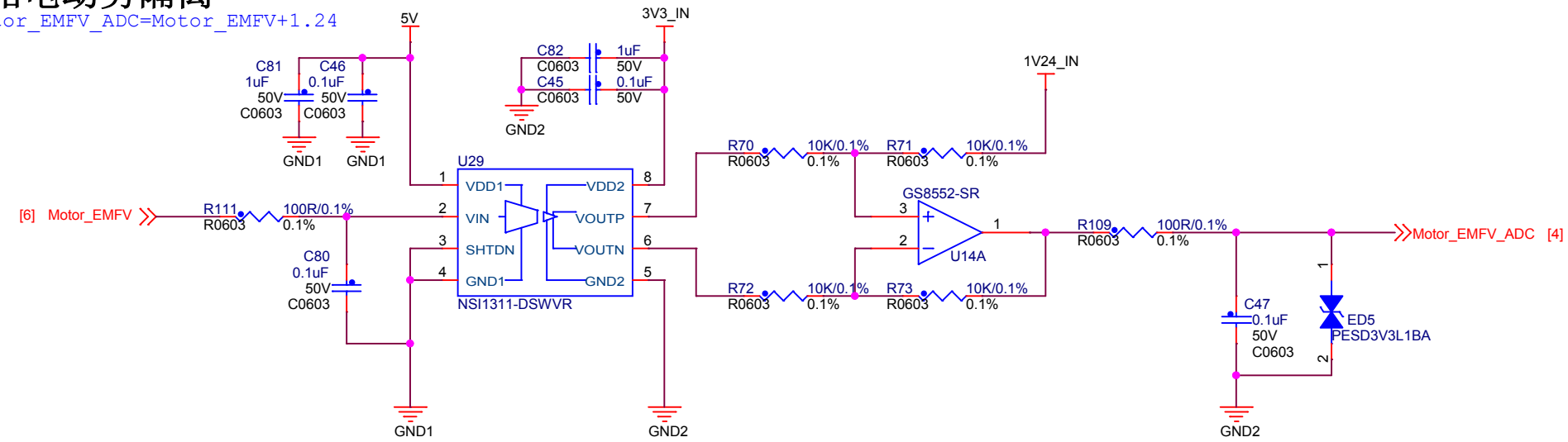
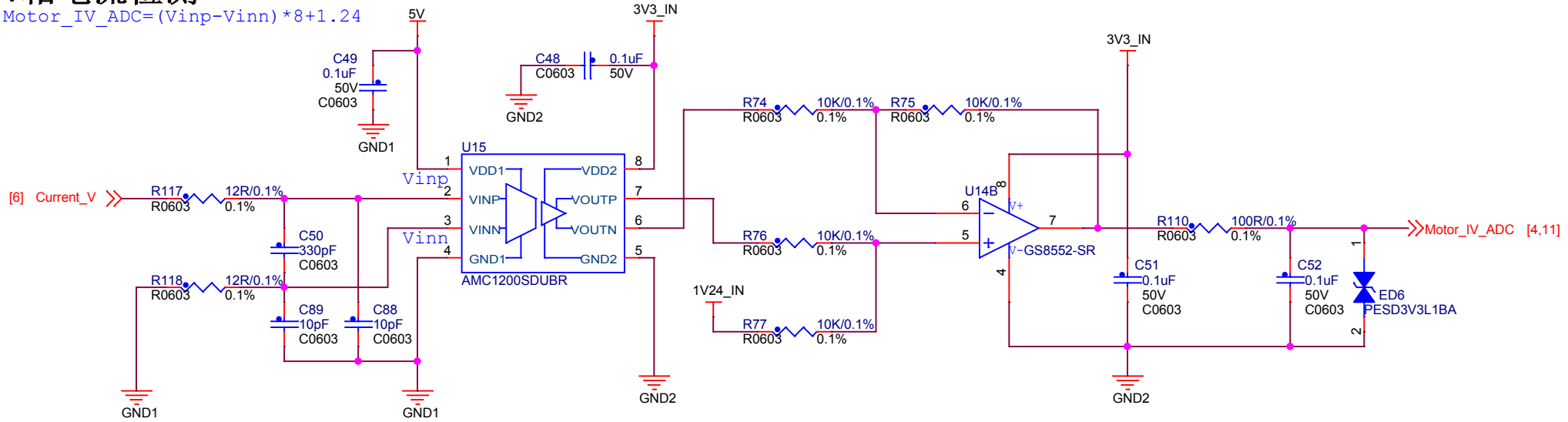
v相电动势隔离

Motor_EMFV_ADC=Motor_EMFV+1.24



v相电流检测

Motor_IV_ADC=(Vinp-Vinn)*8+1.24



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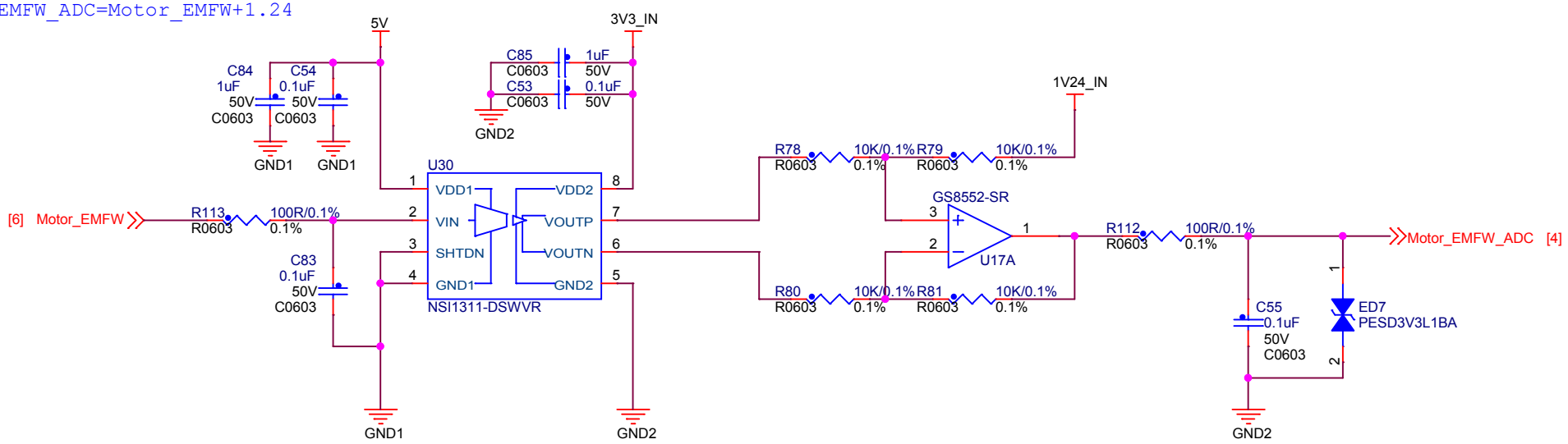
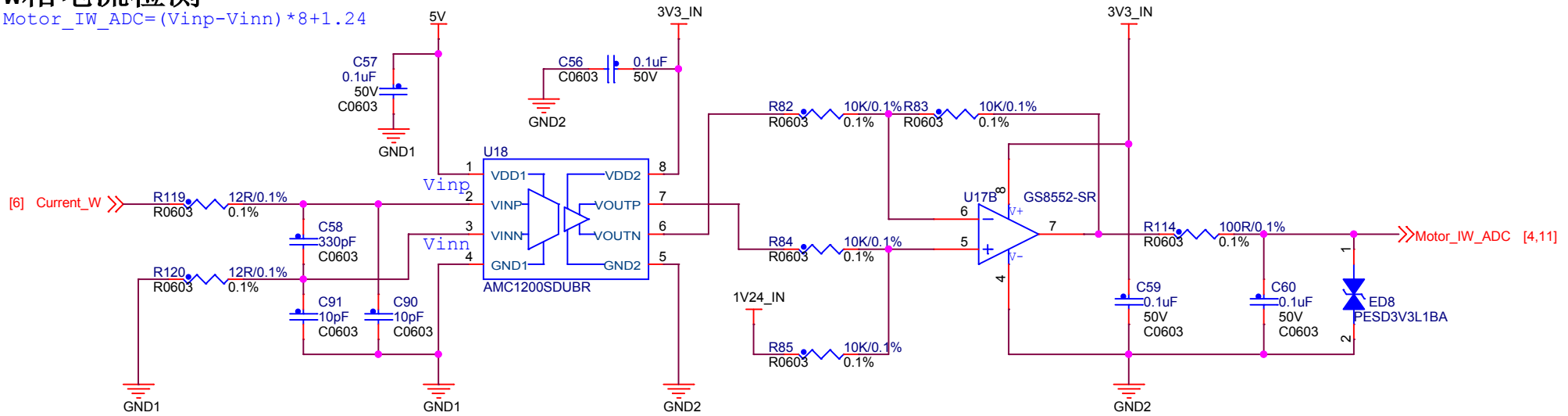
W相电动势隔离

Motor_EMFW_ADC=Motor_EMFW+1.24



W相电流检测

Motor_IW_ADC=(Vinp-Vinn)*8+1.24



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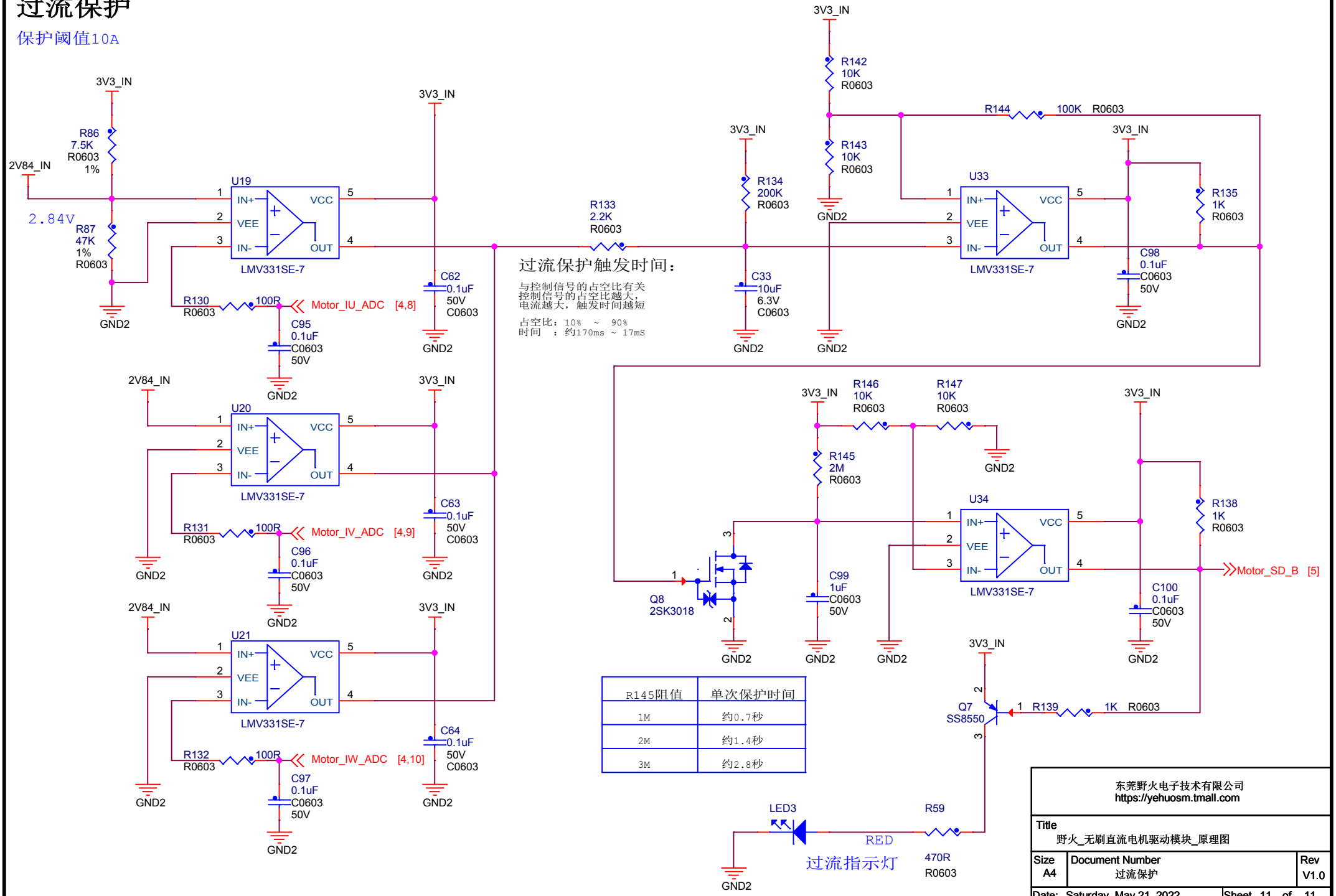
过流保护

保护阈值10A



R145阻值	单次保护时间
1M	约0.7秒
2M	约1.4秒
3M	约2.8秒

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