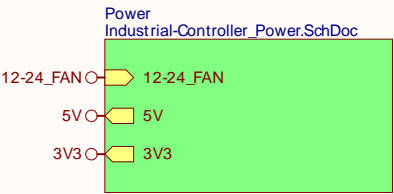
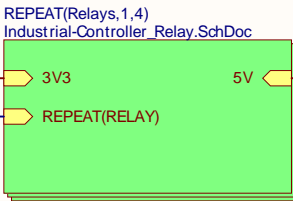
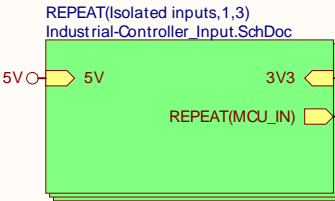
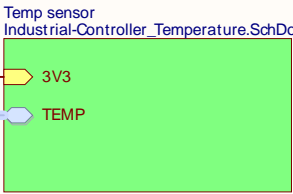
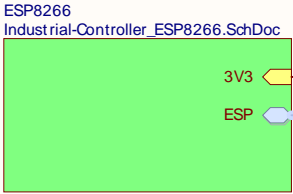
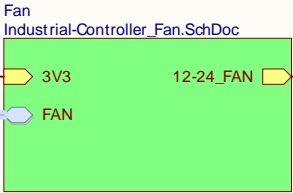
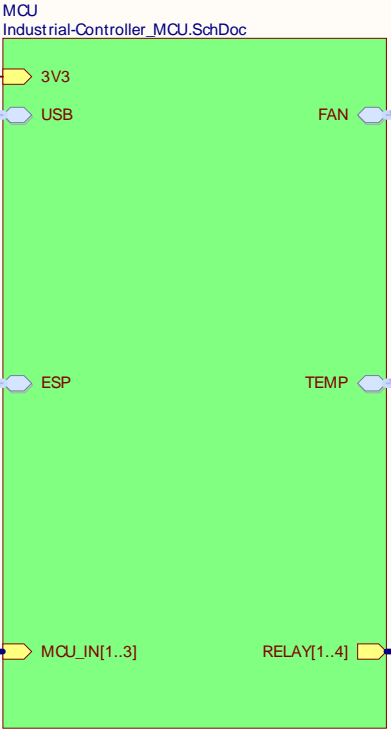
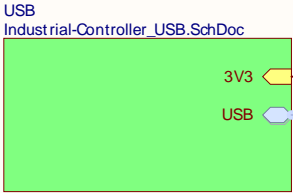



REVISION	DESCRIPTION	DATE	ECO	ENGINEER
0.1.0	Prototype	10/17/2022	0000	Podlesnyi V.S.

## POWER



## MCU



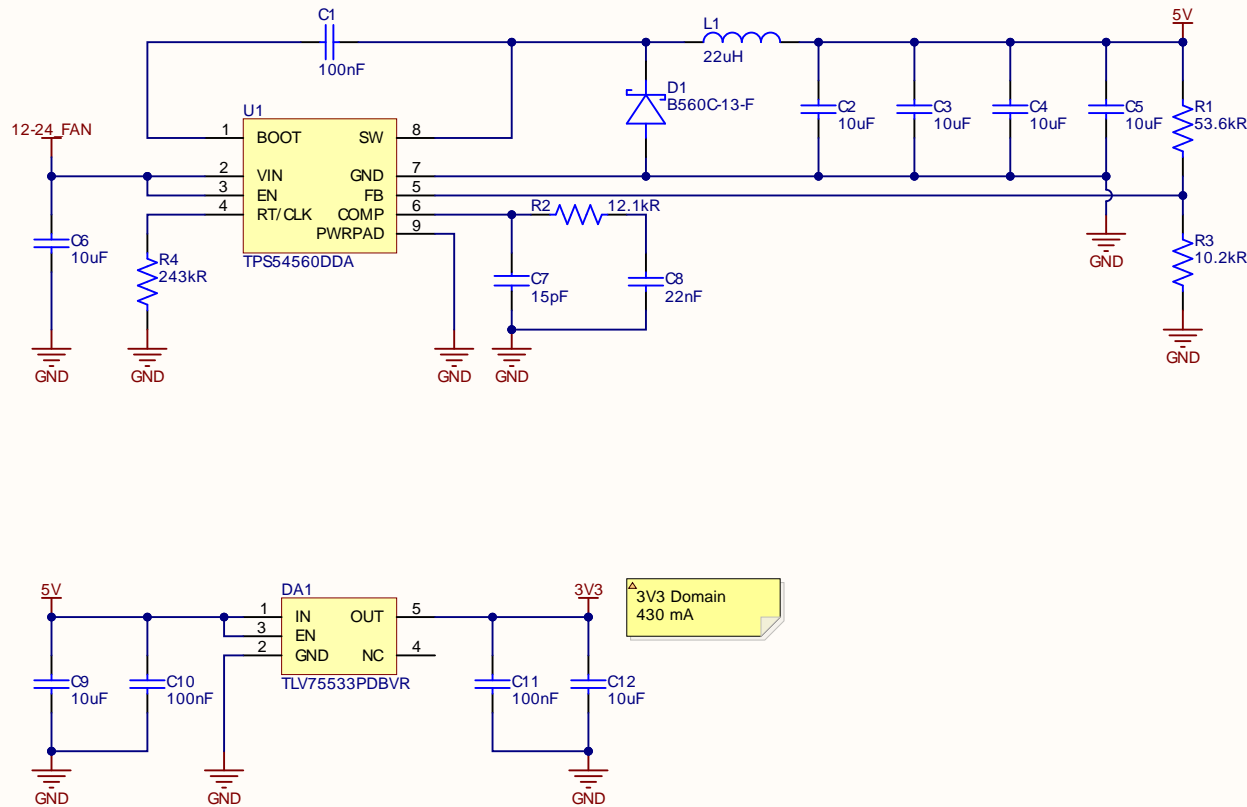
Title: Overview			MRobot, LCC nab. reki Karpovki, d. 5/3E Saint-Petersburg, 197022 Ph: +7 (911) 701-51-99	
Project: Industrial PLC				
Size A	Number: 0000-0000	Revision 0.1.0	Engineer: Podlesnyi Vasilii	<a href="http://www.mrobots.ru">www.mrobots.ru</a>
Date: 20.10.2022	Time: 9:03:14	Sheet 2 of 21		
File: Industrial-Controller_Overview.SchDoc				



[www.mrobots.ru](http://www.mrobots.ru)

12-24\_FAN  
5V  
3V3

12V Domain  
600 mA



5V domain  
1.2A

Inductor ripple current:  
 $I_{out\ max} = 1.2\ A$   
 $L = 22\ \mu H$   
 $V_{in\ max} = 24\ V$   
 $V_{out} = 5\ V$   
 $f = 400\ kHz$   
 $dI_L = 0.45\ A = 38\% I_{outmax}$


Inrush current:  
 $C_{out} = 40\ \mu F$   
 $V_{out} = 5\ V$   
 $t_{ss} = 3\ ms$   
 $I_{inrush} = 0.07\ A$

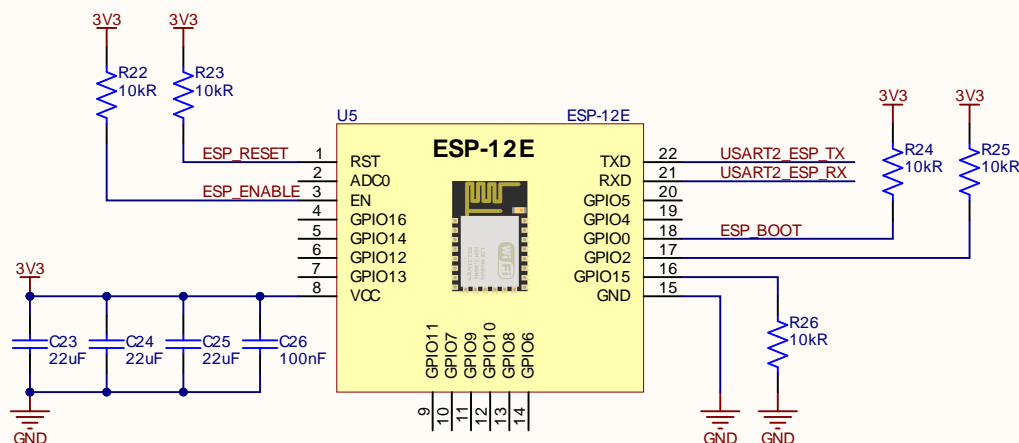
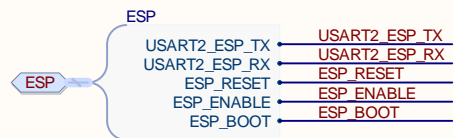
Inductor peak current:  
 $I_{out\ max} = 1.2\ A$   
 $dI_L = 0.45\ A$   
 $I_{inrush} = 0.07\ A$   
 $I_{L\ peak} = 1.2\ A + 0.45\ A/2 + 0.07\ A = 1.5\ A$

Inductor saturation current:  
 $I_{L\ peak} = 1.5\ A$   
 $I_{L\ sat} = 1.5 * I_{L\ peak} = 1.5 * 1.5\ A = 2.25\ A$

$C_{out}$ :  
 $dV_{out} = 1\% V_{out} = 0.05\ V$   
 $dI_L = 30\% I_{out} = 0.45\ A$   
 $f = 400\ kHz$   
 $C_{out} = 2.8\ \mu F$


3V3 Domain  
430 mA

Title: Power			MRobot, LCC nab. reki Karpovki, d. 5/3E Saint-Petersburg, 197022 Ph: +7 (911) 701-51-99		 <a href="http://www.mrobots.ru">www.mrobots.ru</a>
Project: Industrial PLC					
Size A	Number: 0000-0000	Revision 0.1.0	Engineer: Podlesnyi Vasilii		
Date: 20.10.2022	Time: 9:03:15	Sheet 3 of 21			
File: Industrial-Controller Power.SchDoc					



1) UART BOOTLOADER  
GPIO15 - "0" GPIO0 - "0" GPIO2 - "1"

2) FLASH BOOT SKETCH  
GPIO15 - "0" GPIO0 - "1" GPIO2 - "1"

Title: ESP8266			MRobot, LLC nab. reki Karpovki, d. 5/3E Saint-Petersburg, 197022 Ph: +7 (911) 701-51-99	  <a href="http://www.mrobots.ru">www.mrobots.ru</a>
Project: Industrial PLC				
Size A	Number: 0000-0000	Revision 0.1.0	Engineer: Podlesnyi Vasiliy	
Date: 20.10.2022	Time: 9:03:15	Sheet 13 of 21		
File: Industrial-Controller_ESP8266.SchDoc				

3V3

USB

MCU\_USB\_D\_N

MCU\_USB\_D\_N

MCU\_USB\_D\_P

MCU\_USB\_D\_P

USB

3V3

R12  
1.5kR

D\_N

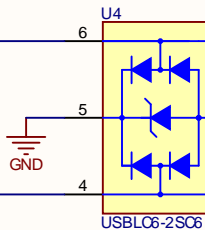
MCU\_USB\_D\_N

R13  
24R

MCU\_USB\_D\_P

R14  
24R

D\_P



USBLO6-2S06

J1

VBUS  
D-  
D+  
GND  
SHELL

USB Type B

DS1099-WN0

Title: USB

Project: Industrial PLC

Size A Number: 0000-0000

Revision 0.1.0

Date: 20.10.2022 Time: 9:03:15

Sheet 14 of 21

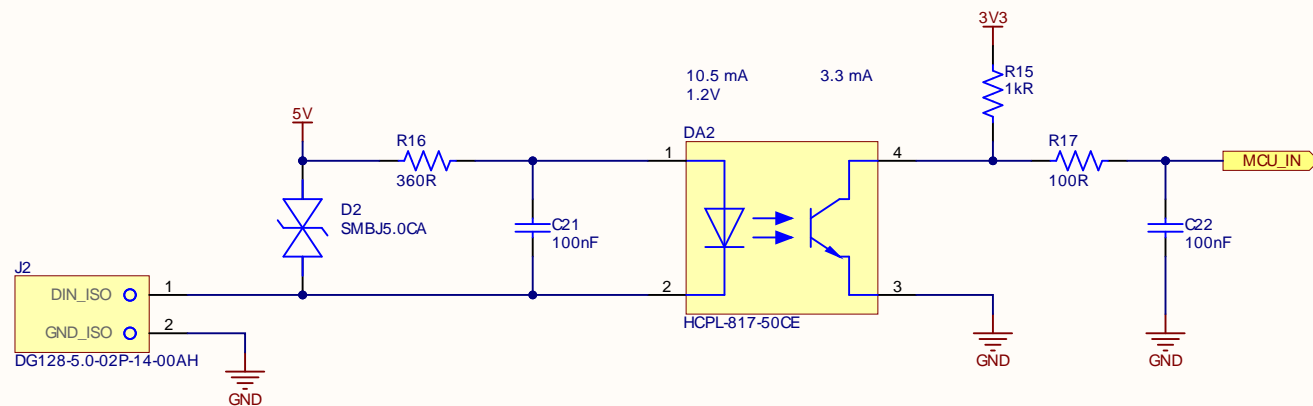
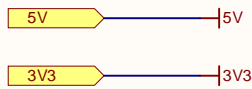
File: Industrial-Controller\_USB.SchDoc


MRobot, LCC  
nab. reki Karpovki, d. 5/3E  
Saint-Petersburg, 197022  
Ph: +7 (911) 701-51-99

Engineer:  
Podlesnyi Vasilii



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Title: Isolated inputs			MRobot, LCC nab. reki Karpovki, d. 5/3E Saint-Petersburg, 197022 Ph: +7 (911) 701-51-99	
Project: Industrial PLC				
Size A	Number: 0000-0000	Revision 0.1.0	Engineer: Podlesnyi Vasilii	<a href="http://www.mrobots.ru">www.mrobots.ru</a>
Date: 20.10.2022	Time: 9:03:15	Sheet 17 of 21		
File: Industrial-Controller_Input.SchDoc				

3V3

3V3

TEMP

USART1\_TEMP1

USART1\_TEMP1

USART2\_TEMP2

USART2\_TEMP2

TEMP

3V3

R20  
4.7kR

USART1\_TEMP1

D5  
SMBJ3.3A

GND

3V3

J4

1 VDD

2 DQ

3 GND

DG128-5.0-03P-14-00AH

GND

3V3

R21  
4.7kR

USART2\_TEMP2

D6  
SMBJ3.3A

GND

3V3

J5

1 VDD

2 DQ

3 GND

DG128-5.0-03P-14-00AH

GND

Title: Temp sensor

Project: Industrial PLC

Size A Number: 0000-0000

Revision 0.1.0

Date: 20.10.2022 Time: 9:03:15

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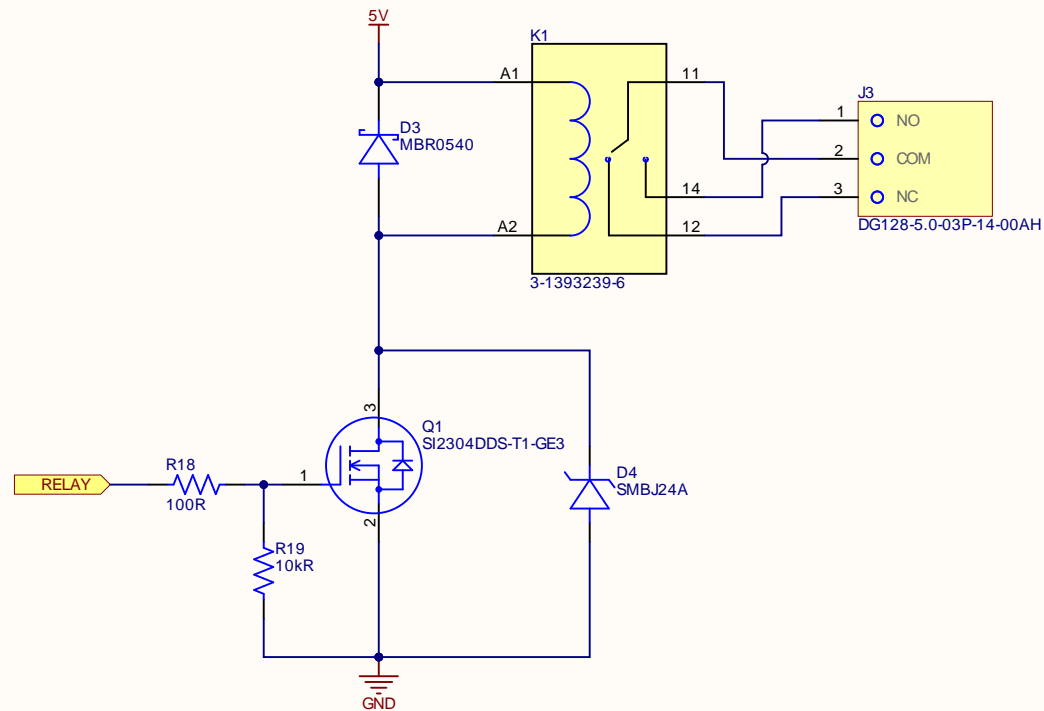
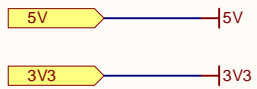
File: Industrial-Controller\_Temperature.SchDoc


MRobot, LCC  
nab. reki Karpovki, d. 5/3E  
Saint-Petersburg, 197022  
Ph: +7 (911) 701-51-99

Engineer:  
Podlesnyi Vasilii



[www.mrobots.ru](http://www.mrobots.ru)



Title: Relays			MRobot, LCC nab. reki Karpovki, d. 5/3E Saint-Petersburg, 197022 Ph: +7 (911) 701-51-99	
Project: Industrial PLC				
Size A	Number: 0000-0000	Revision 0.1.0	Engineer: Podlesnyi Vasilii	<a href="http://www.mrobots.ru">www.mrobots.ru</a>
Date: 20.10.2022	Time: 9:03:15	Sheet 19 of 21		
File: Industrial-Controller_Relay.SchDoc				

A

A

B

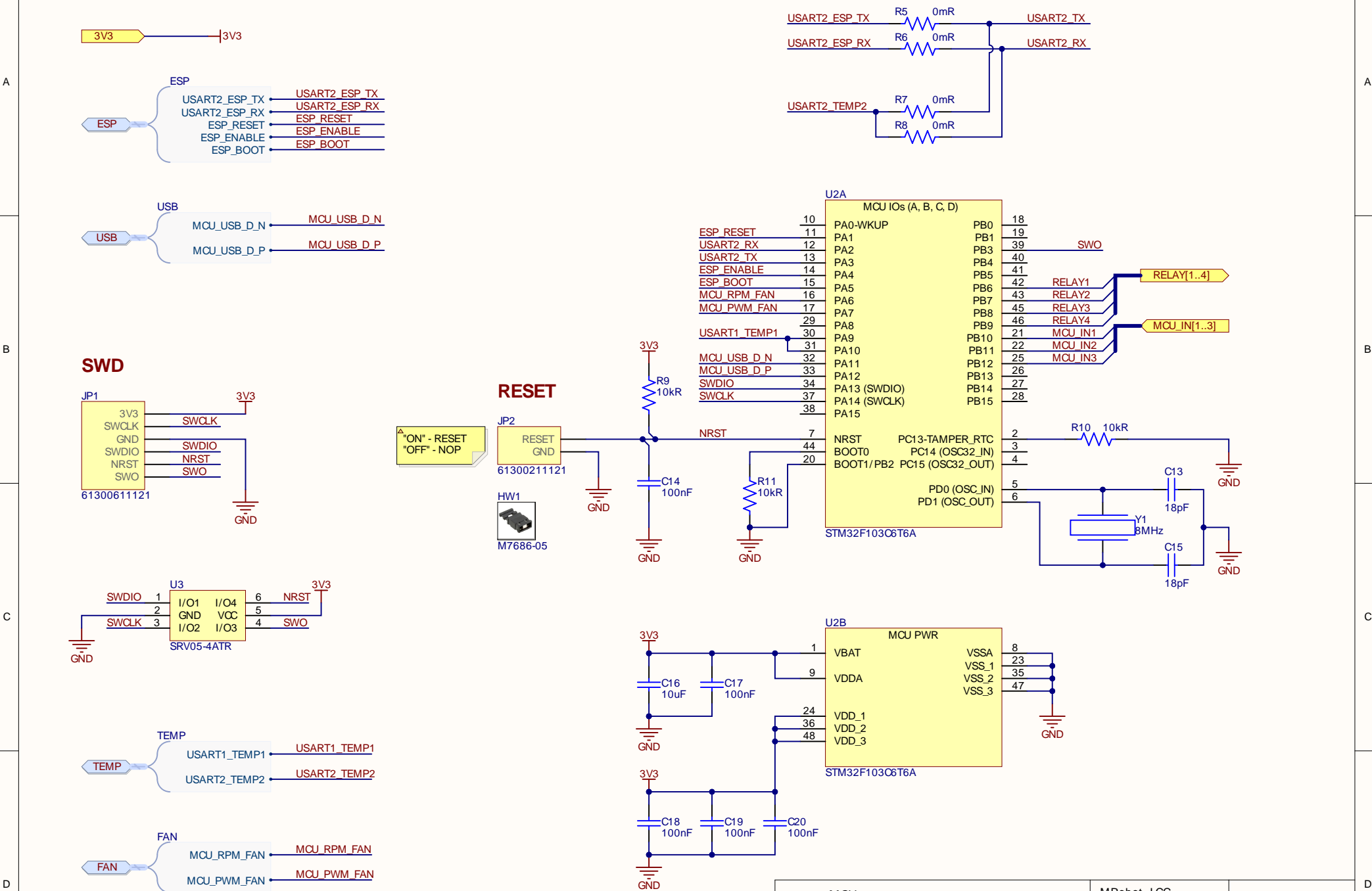
B


C

C

D

D

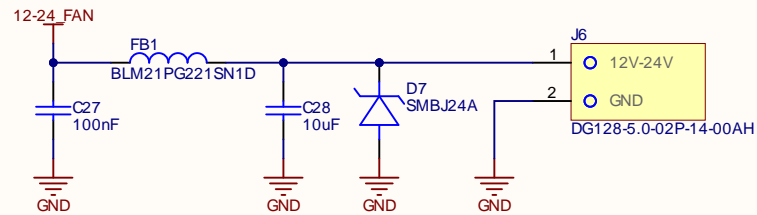
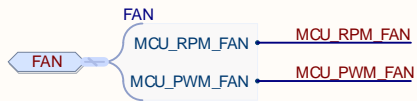


Title: MCU			MRobot, LCC nab. reki Karpovki, d. 5/3E Saint-Petersburg, 197022 Ph: +7 (911) 701-51-99		 <a href="http://www.mrobots.ru">www.mrobots.ru</a>
Project: Industrial PLC					
Size A	Number: 0000-0000	Revision 0.1.0	Engineer: Podlesnyi Vasilii		
Date: 20.10.2022	Time: 9:03:15	Sheet 19 of 21			
File: Industrial-Controller MCU.SchDoc					



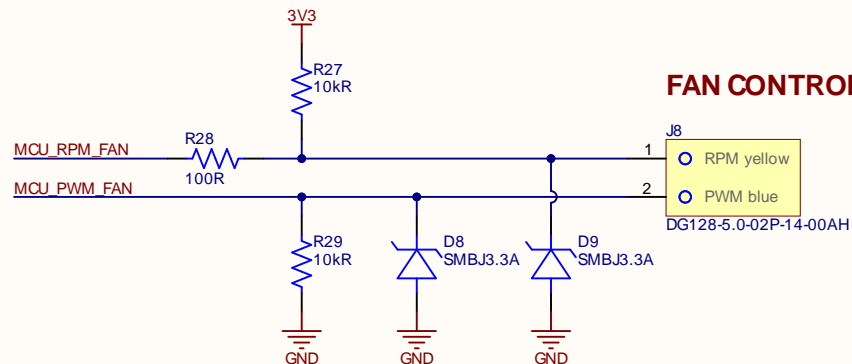
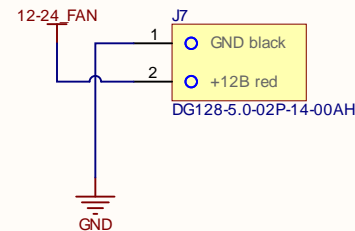
12-24\_FAN

3V3




## INPUT POWER

## FAN POWER



## FAN CONTROL

Title: Fan			MRobot, LCC nab. reki Karpovki, d. 5/3E Saint-Petersburg, 197022 Ph: +7 (911) 701-51-99	
Project: Industrial PLC				
Size A	Number: 0000-0000	Revision 0.1.0	Engineer: Podlesnyi Vasilii	<a href="http://www.mrobots.ru">www.mrobots.ru</a>
Date: 20.10.2022	Time: 9:03:15	Sheet 20 of 21		
File: Industrial-Controller_Fan.SchDoc				