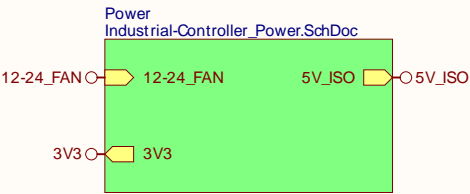
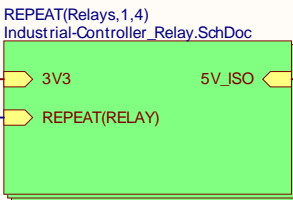
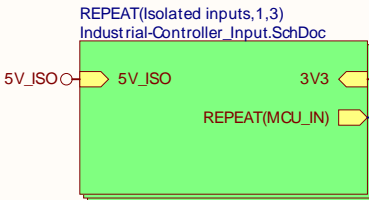
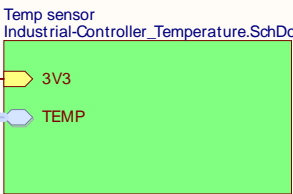
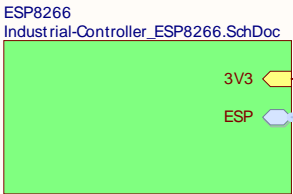
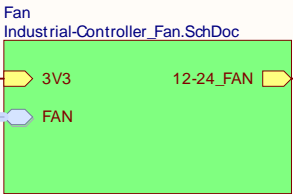
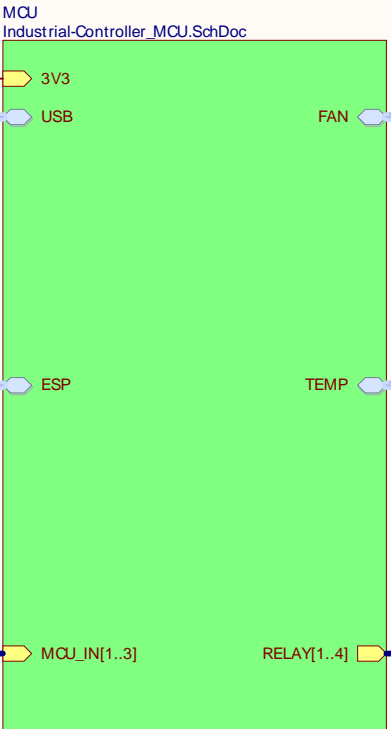
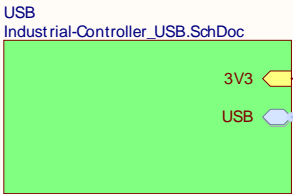



REVISION	DESCRIPTION	DATE	ECO	ENGINEER
0.1.0	Prototype	10/17/2022	0000	Podlesnyi V.S.

POWER



MCU

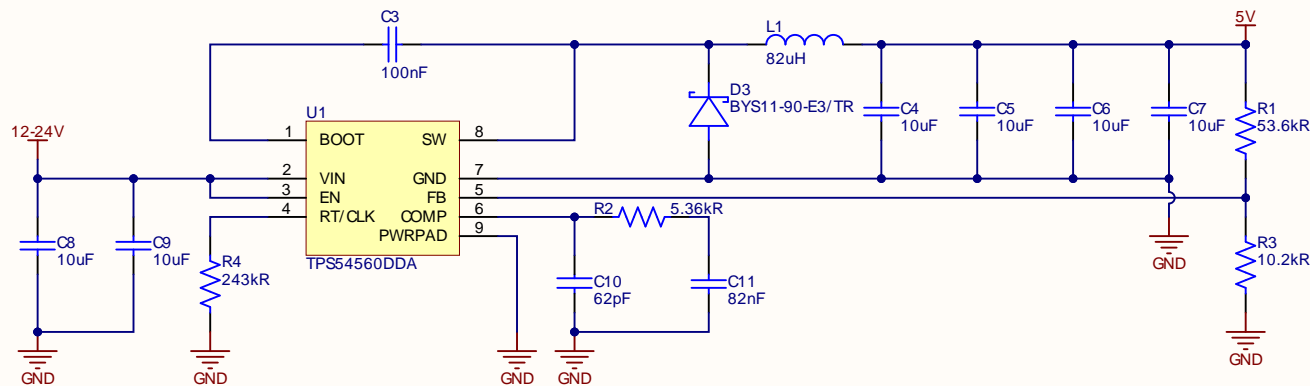
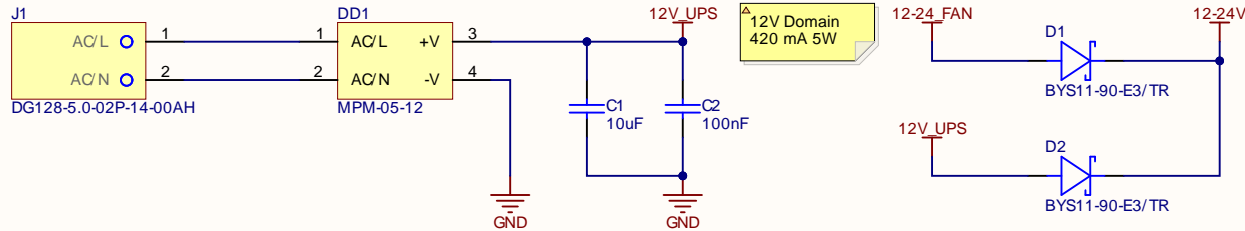


Title: Overview			MRobot, LCC nab. reki Karpovki, d. 5/3E Saint-Petersburg, 197022 Ph: +7 (911) 701-51-99	
Project: Industrial PLC				
Size A	Number: 0000-0000	Revision 0.1.0	Engineer: Podlesnyi Vasilii	www.mrobots.ru
Date: 17.10.2022	Time: 21:29:21	Sheet 2 of 21		
File: Industrial-Controller_Overview.SchDoc				

12-24_FAN

3V3

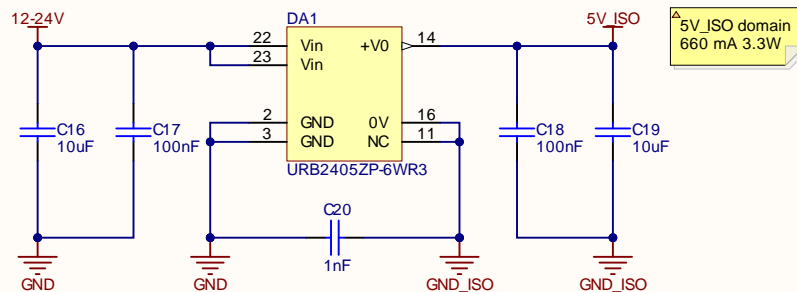
5V_ISO



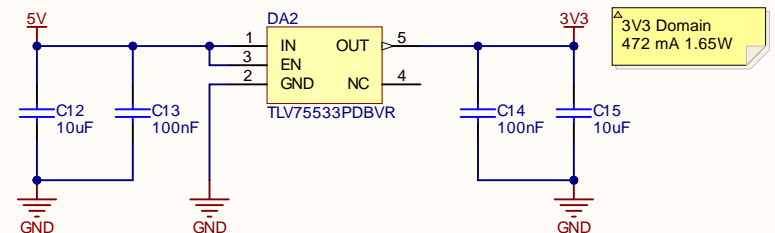
5V domain
330 mA 1.65W

Inductor:
Iout max = 400mA
dL = 30%Iout = 120 mA
Vin max = 24V
Vout = 5V
f = 400 kHz
L = 82 uH


Cout:
dVout = 1%Vout = 0.05 V
dL = 30%Iout = 120 mA
f = 400 kHz
Cout = 1uF



5V_ISO domain
660 mA 3.3W



3V3 Domain
472 mA 1.65W

Title: Power			MRobot, LCC nab. reki Karpovki, d. 5/3E Saint-Petersburg, 197022 Ph: +7 (911) 701-51-99		 www.mrobots.ru
Project: Industrial PLC					
Size A	Number: 0000-0000	Revision 0.1.0	Engineer: Podlesnyi Vasilii		
Date: 17.10.2022	Time: 21:29:21	Sheet 3 of 21			
File: Industrial-Controller_Power.SchDoc					

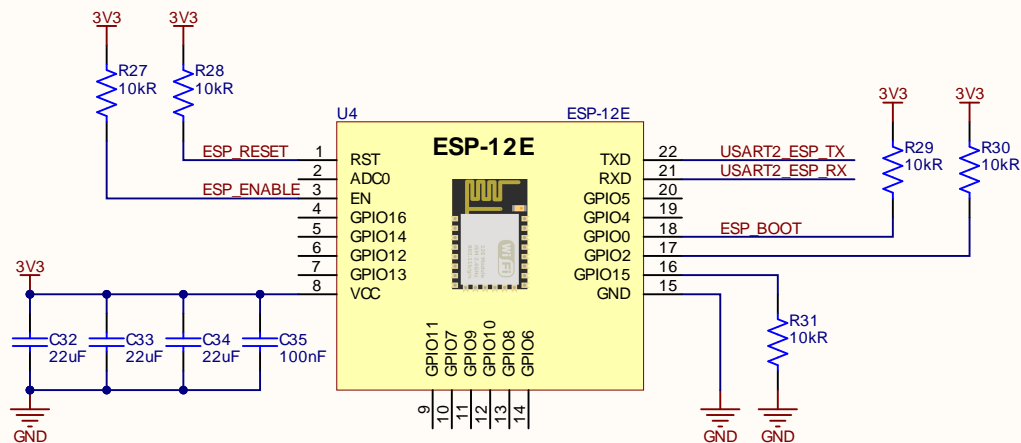
3V3

3V3

ESP

USART2_ESP_TX
USART2_ESP_RX
ESP_RESET
ESP_ENABLE
ESP_BOOT


ESP



BOOT MODES:

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

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

Title: ESP8266			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	www.mrobots.ru
Date: 17.10.2022	Time: 21:29:21	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

MCU_USB_D_N

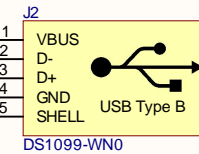
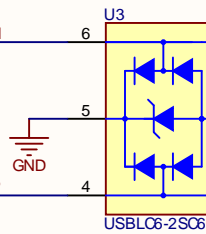
R13
24R

MCU_USB_D_P

R14
24R

D_N

D_P



Title: USB

Project: Industrial PLC

Size A Number: 0000-0000

Date: 17.10.2022 Time: 21:29:21

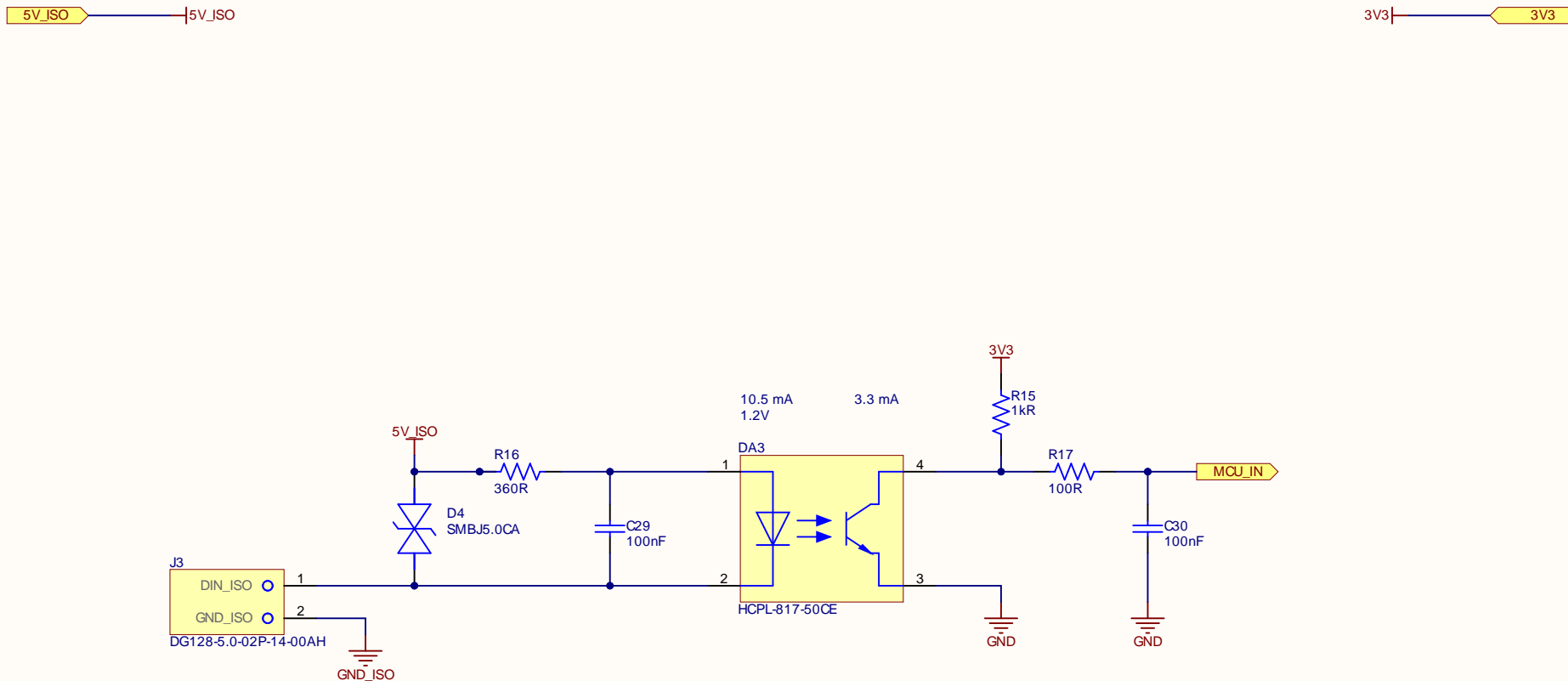
File: Industrial-Controller_USB.SchDoc

MRobot, LCC
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Saint-Petersburg, 197022
Ph: +7 (911) 701-51-99

Engineer:
Podlesnyi Vasilii




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Current consumption: $(5V-1.2V) / 360 \text{ Ohm} = 10.5 \text{ mA}$

Power dissipation: $0.0105 \text{ A} * 0.0105 \text{ A} * 360 \text{ Ohm} = 0.04 \text{ W} (0.1 \text{ max})$

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
Date: 17.10.2022	Time: 21:29:21	Sheet 17 of 21	
File: Industrial-Controller_Input.SchDoc			


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3V3

3V3

TEMP

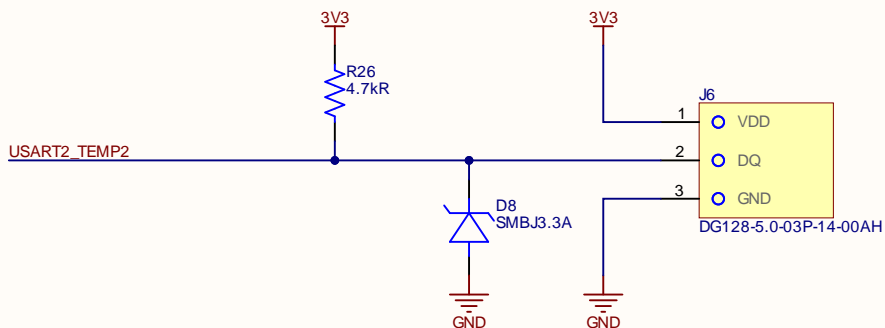
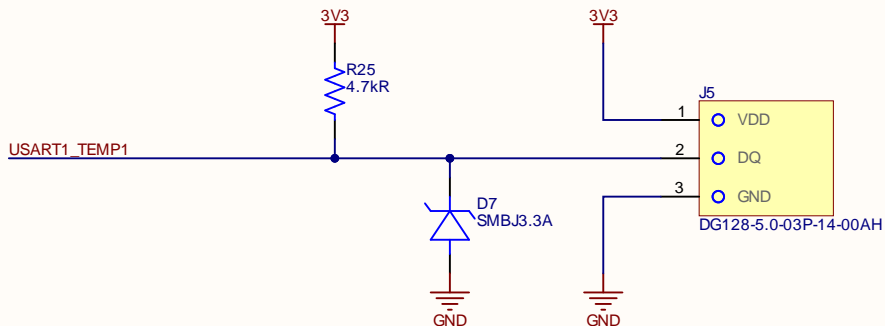
USART1_TEMP1

USART1_TEMP1

USART2_TEMP2

USART2_TEMP2

TEMP



Title: Temp sensor

Project: Industrial PLC

Size A Number: 0000-0000

Date: 17.10.2022 Time: 21:29:22

File: Industrial-Controller_Temperature.SchDoc

Revision 0.1.0

Sheet 18 of 21

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

Engineer:
Podlesnyi Vasilii

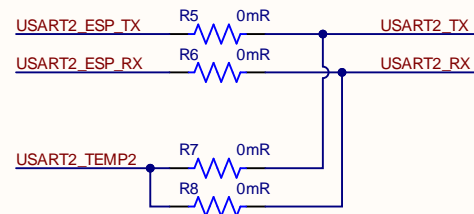


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3V3

ESP

USART2_ESP_TX
USART2_ESP_RX
ESP_RESET
ESP_ENABLE
ESP_BOOT



USB

MCU_USB_D_N
MCU_USB_D_P

U2A

MCU IOs (A, B, C, D)

ESP_RESET
USART2_RX
USART2_TX
ESP_ENABLE
ESP_BOOT
MCU_RPM_FAN
MCU_PWM_FAN
USART1_TEMP1
MCU_USB_D_N
MCU_USB_D_P
SWDIO
SWCLK

PB0
PB1
PB3
PB4
PB5
PB6
PB7
PB8
PB9
PB10
PB11
PB12
PB13
PB14
PB15

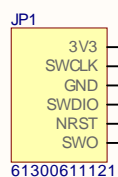
PC13-TAMPER_RTC
PC14 (OSC32_IN)
PC15 (OSC32_OUT)
PD0 (OSC_IN)
PD1 (OSC_OUT)

STM32F103C6T6A

NRST
BOOT0
BOOT1/PB2

STM32F103C6T6A

SWD



RESET

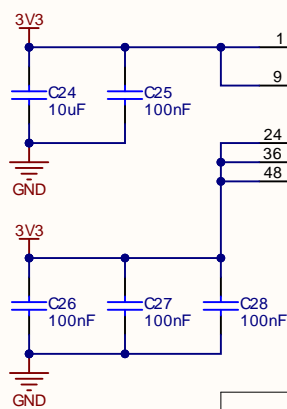
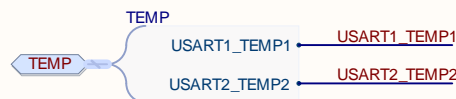
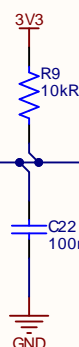
JP2

RESET GND

61300211121

HW1

M7686-05




U2B

MCU PWR

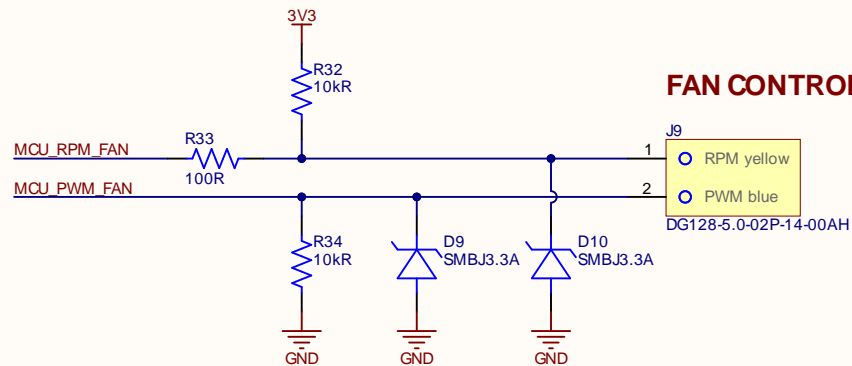
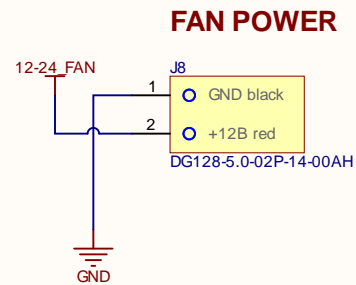
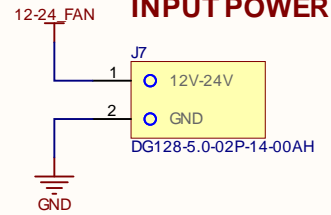
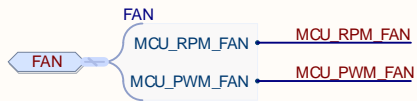
VBAT
VDDA
VDD_1
VDD_2
VDD_3


STM32F103C6T6A

Title: MCU			MRobot, LCC nab. reki Karpovki, d. 5/3E Saint-Petersburg, 197022 Ph: +7 (911) 701-51-99		 www.mrobots.ru
Project: Industrial PLC					
Size A	Number: 0000-0000	Revision 0.1.0	Engineer: Podlesnyi Vasilii		
Date: 17.10.2022	Time: 21:29:22	Sheet 19 of 21			
File: Industrial-Controller_MCU.SchDoc					

12-24_FAN

3V3



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	www.mrobots.ru
Date: 17.10.2022	Time: 21:29:22	Sheet 20 of 21		
File: Industrial-Controller_Fan.SchDoc				