

MOTOR CONTROLLER

Electrical Schematic

Project Name:
Project Number:

Revision Sheet

Revision	Author	Date	Change Description
A01	Reuf Qereshniku	02 Feb 2021	First draft based on Zollner Elektronik AG schematic dwg. nr. 10856-Z-001-102 Ver. 2.3
A02	Fernando Bettani	04 Feb 2021	Minor changes to match original board layout
A03	Reuf Qereshniku	09 Mar 2021	Design updated accordig to F22_027_fORward_MRS_Motorcontroller_V01-signed Main changes: - 1 MCU architecture - Footswitch analogue interface added - Flash memory and M-Ram memory removed - F-Ram memory added
A04	Reuf Qereshniku	15 Mar 2021	- Voltage translators added in CAN interface for MCU inputs - Voltage translators added in 485 interface for MCU inputs - CAN interface re-drawn to fit new components - CAN loopback buffers moved to 3.3V supply - Position sensor changed to ADIS16209 - Added 15k resistors to make voltage dividers in the IR OVC outputs



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MIL-DES4011-05 Rev.A - Electrical Schematic

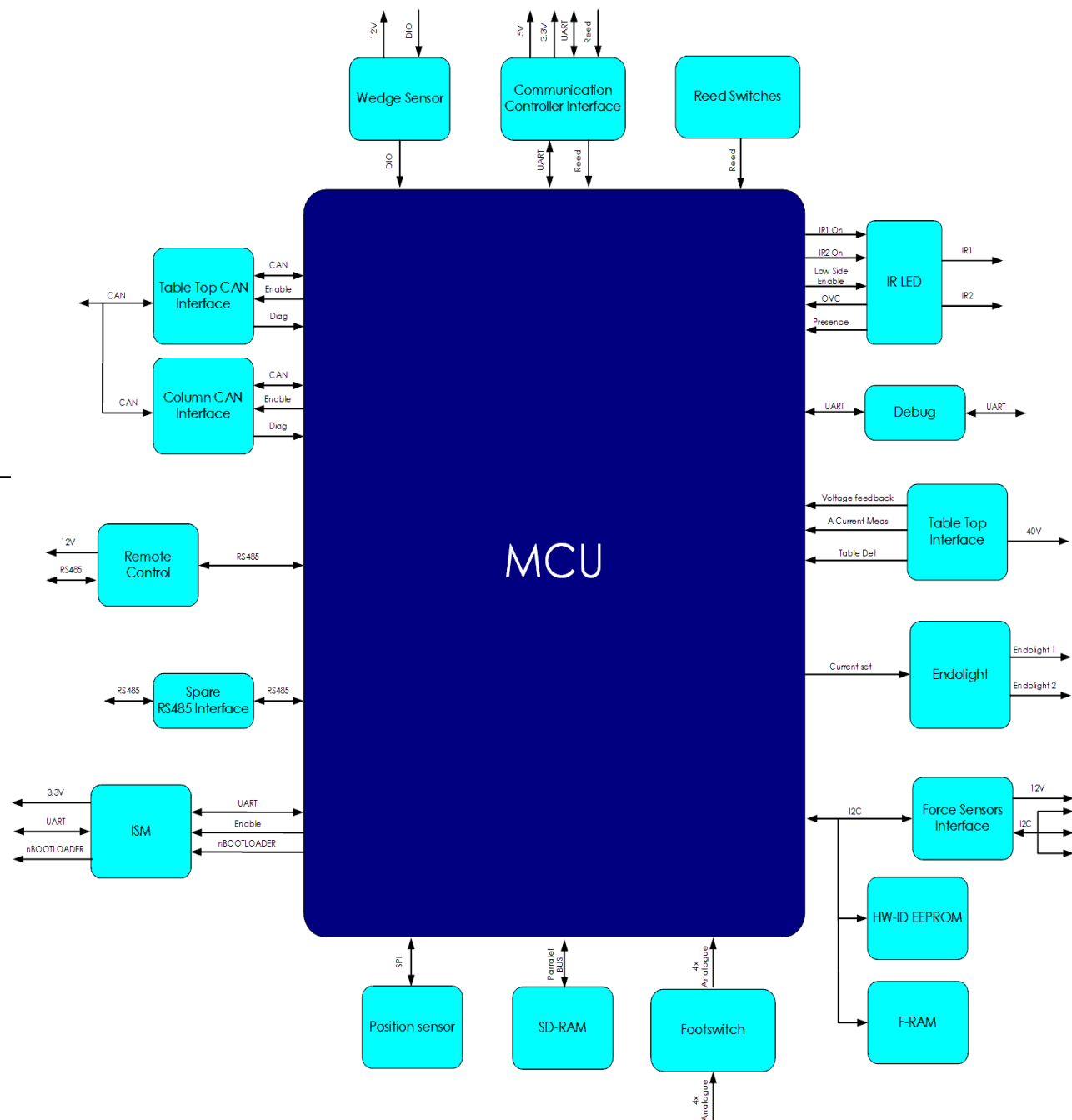
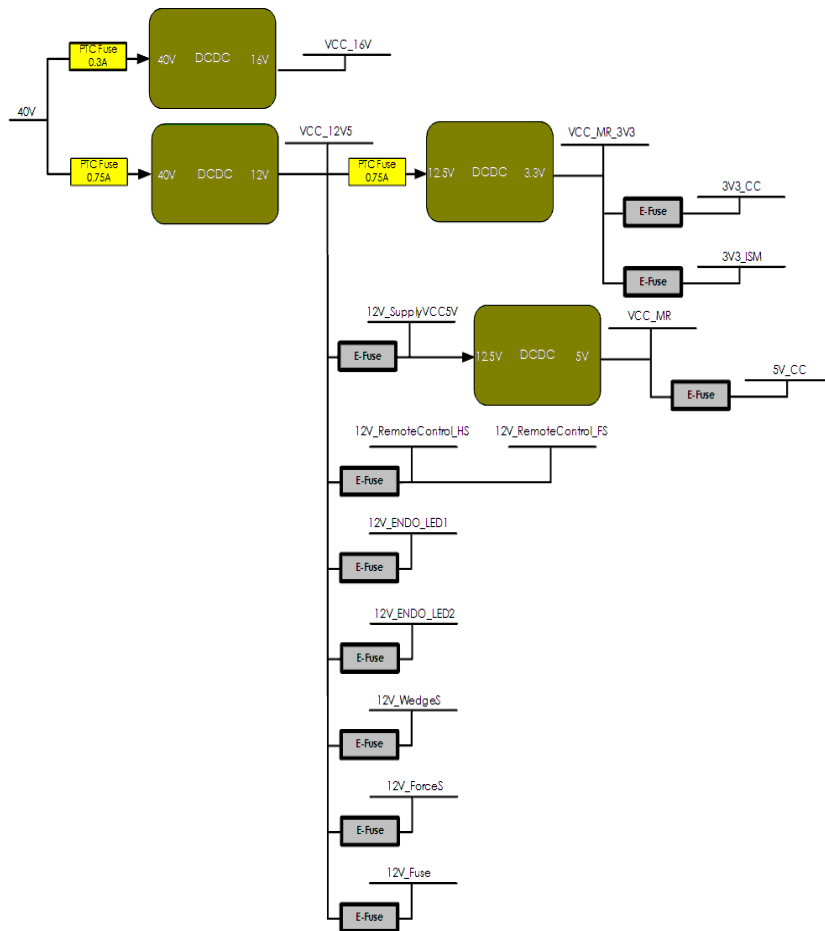
Author

Name	Title	Signature and Date
Reuf Qereshniku	Hardware Engineer	

Approvals

Name	Title	Signature and Date
Enrico Denna	Hardware Manager (Reviewer)	
NA	NA	

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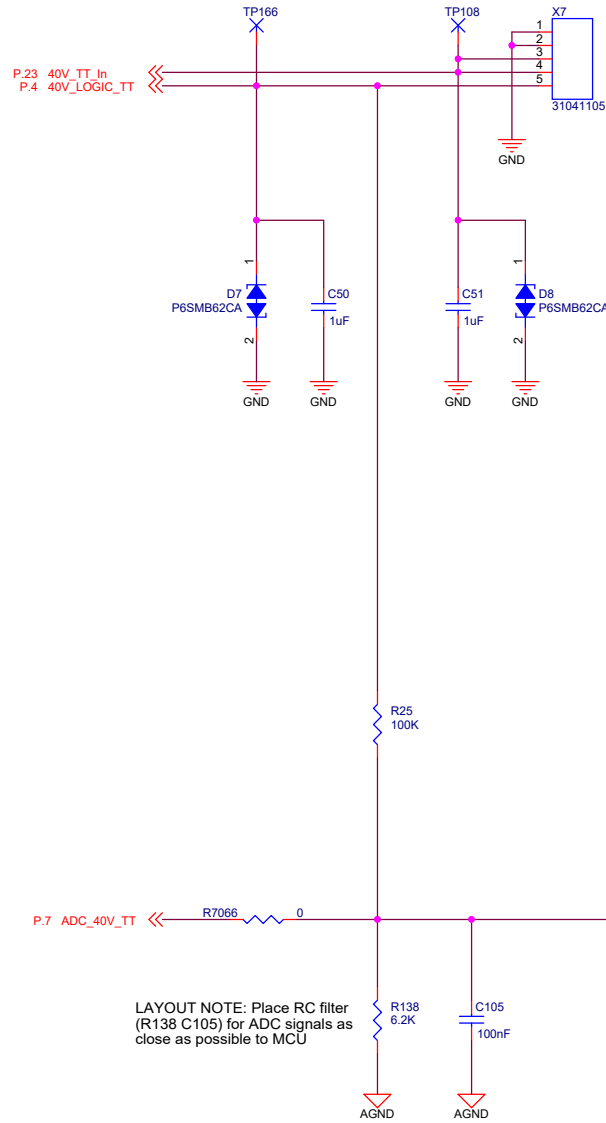
LAB1
PCB-LABEL

PCB1
Printed
Circuit
Board
PCB-FORWARD

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Design Title MOTOR CONTROLLER			
Page Title Block Diagram			
Author: Reuf Qereshniku		Approved by: Enrico Denna	
Size: A3	Doc. Number: HR100047527-100-SF	Rev: A04	
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Table Top Power In



Column Power In & CAN Interface

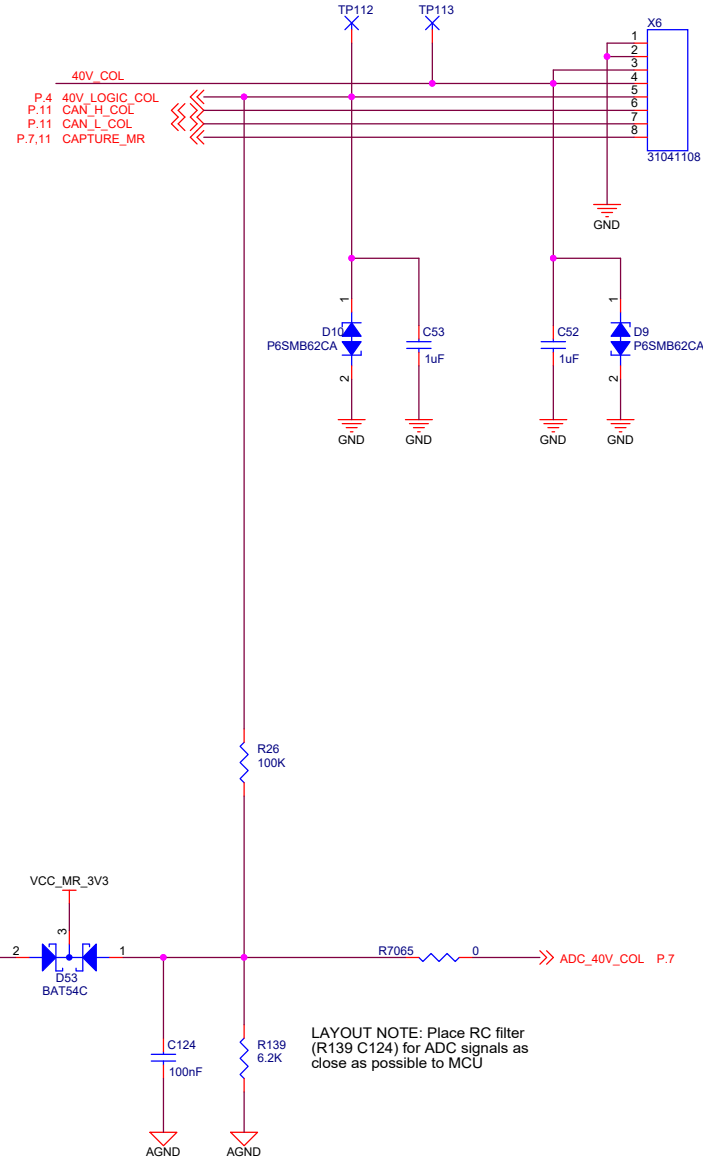
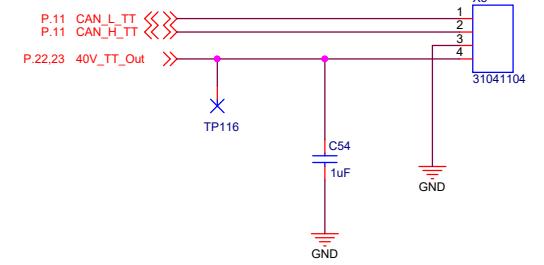

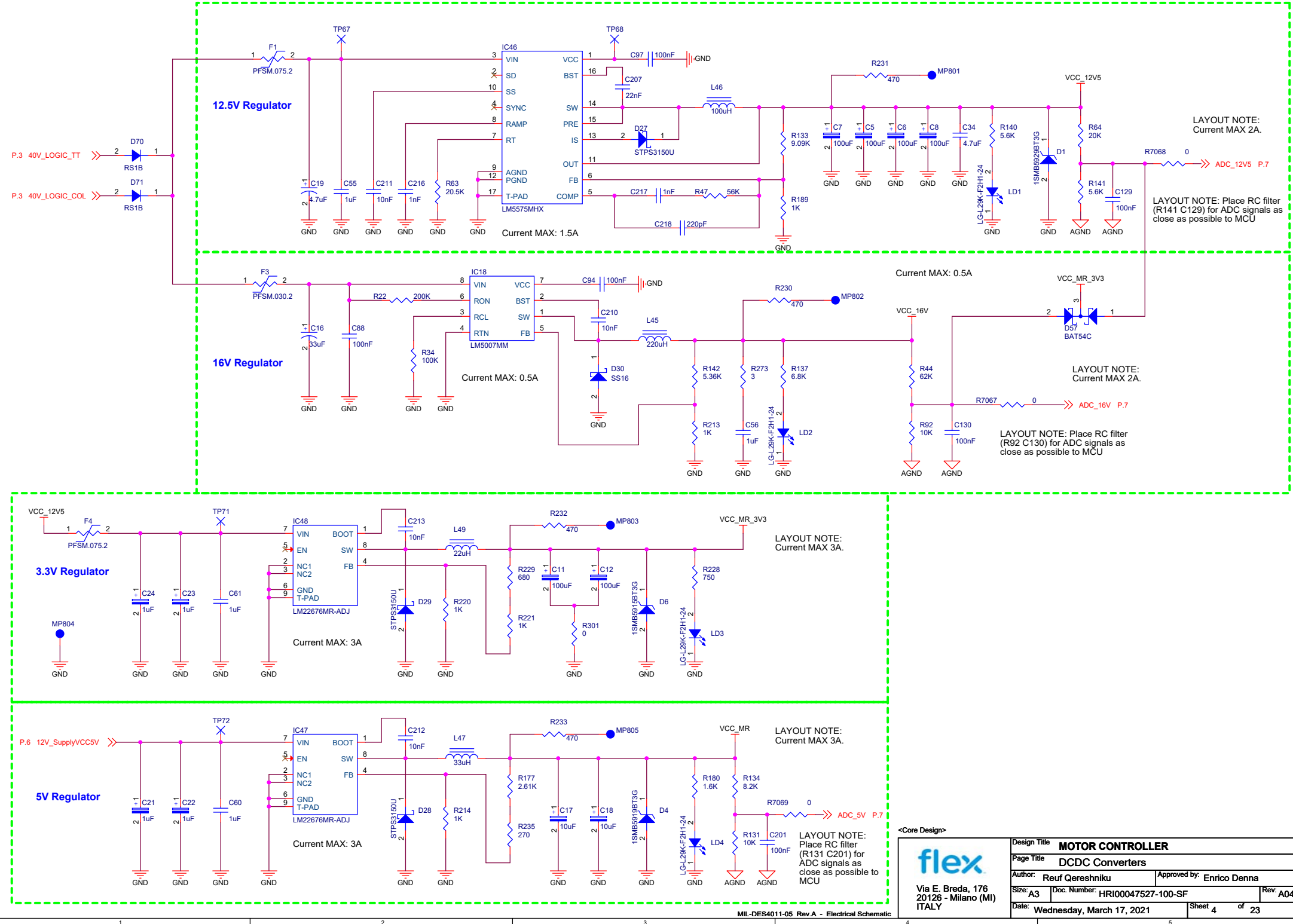


Table Top Power Out & CAN Interface



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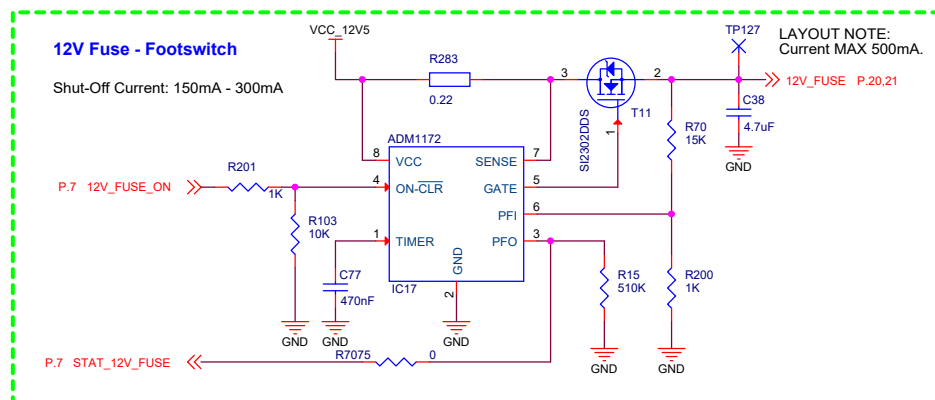
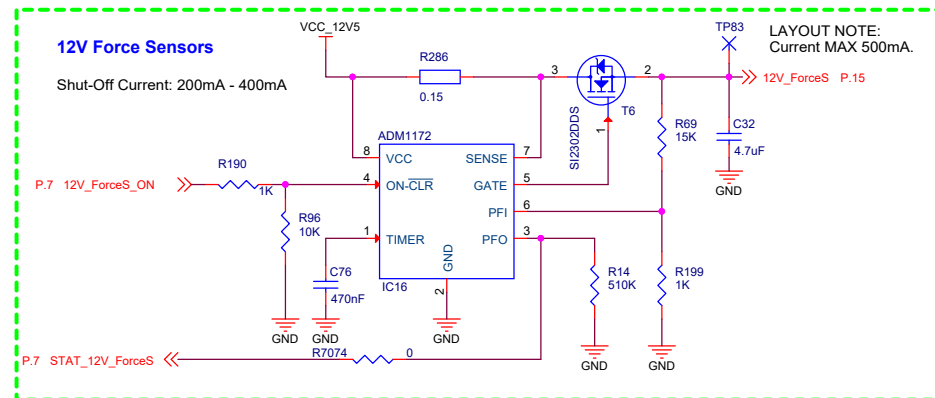
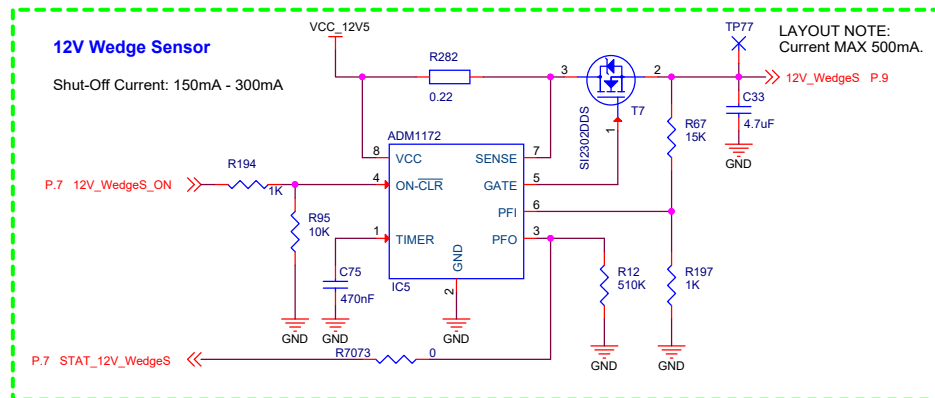
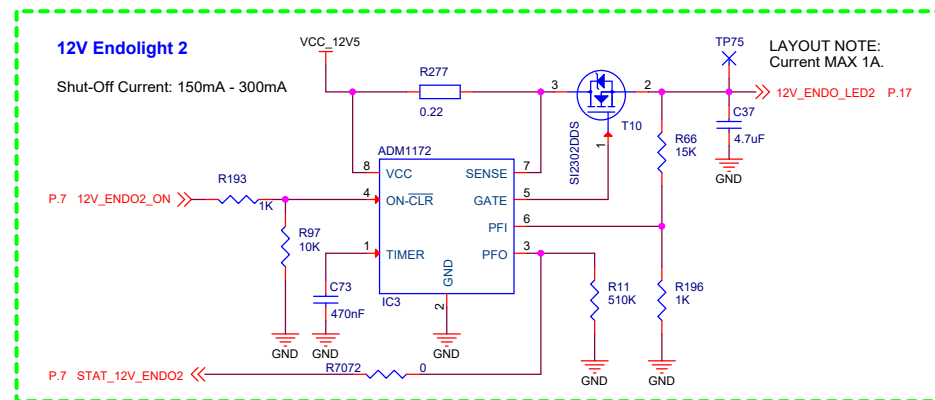
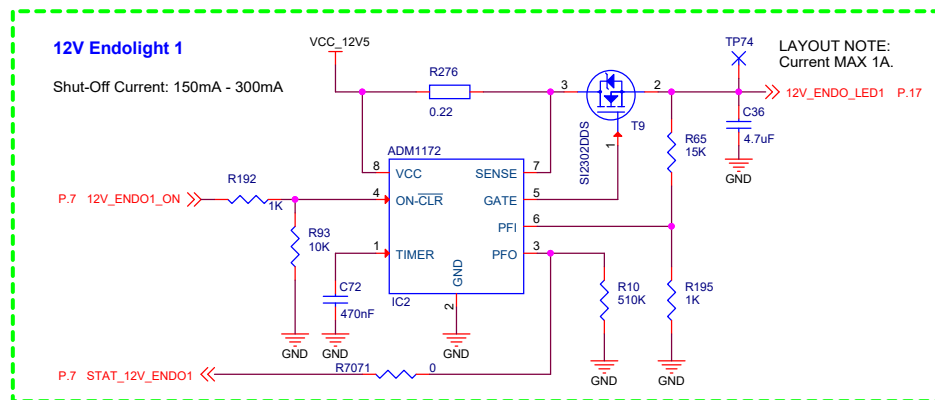
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	Author: Reuf Qereshniku		Approved by: Enrico Denna	
	Size: A3		Doc. Number: HRI00047527-100-SF	
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Design Title		MOTOR CONTROLLER	
Page Title		DCDC Converters	
Author: Reuf Qereshniku		Approved by: Enrico Denna	
Size: A3	Doc. Number: HRI00047527-100-SF	Rev: A04	
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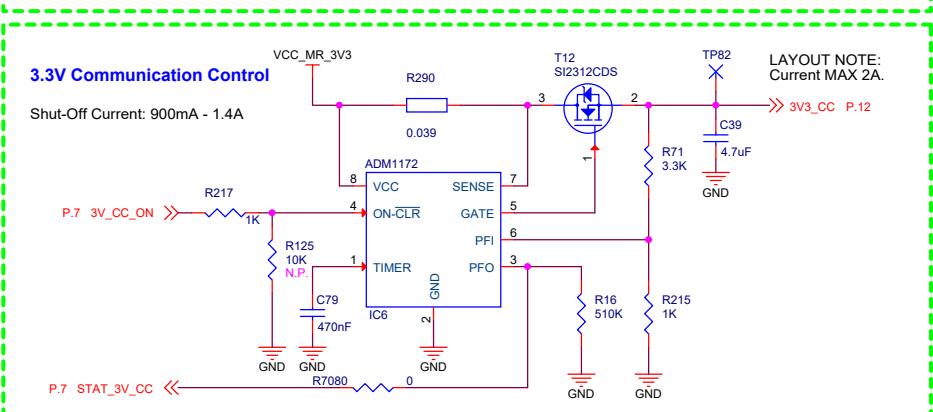
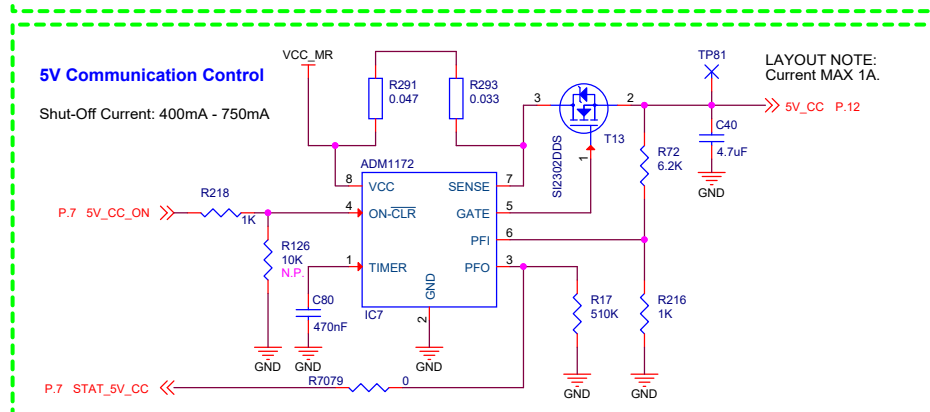
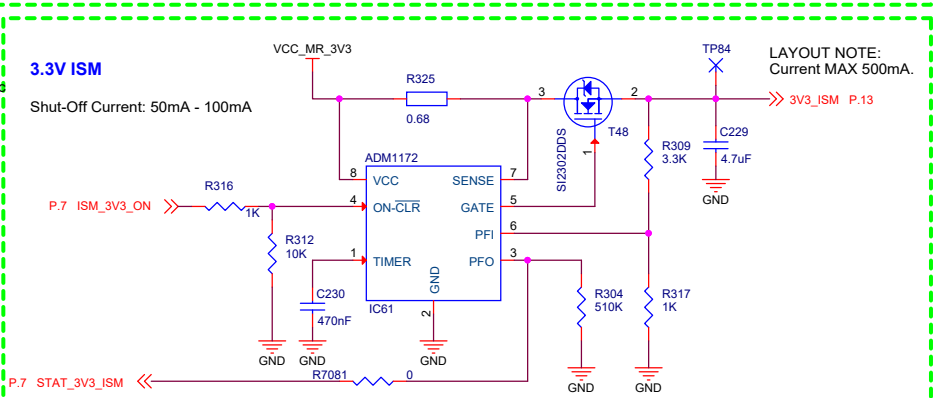
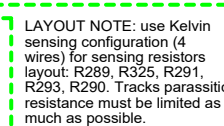
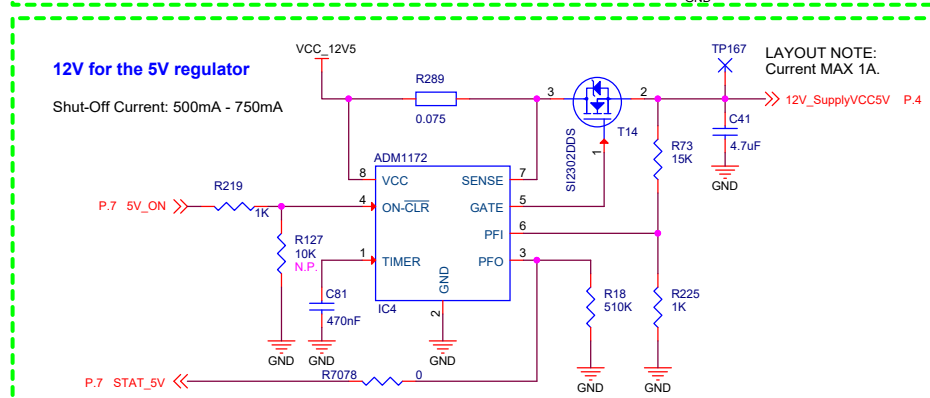
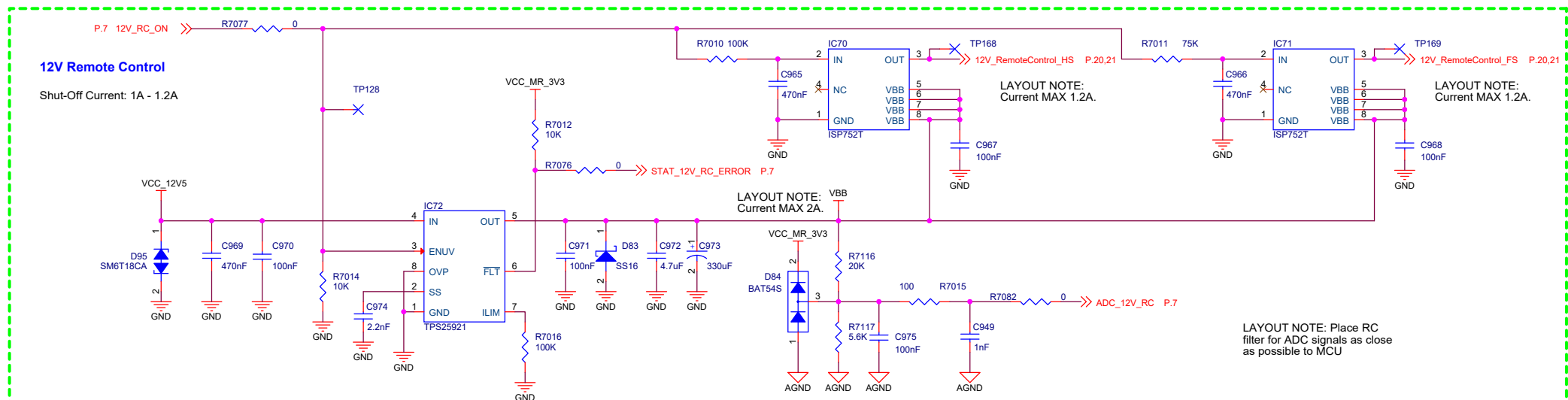




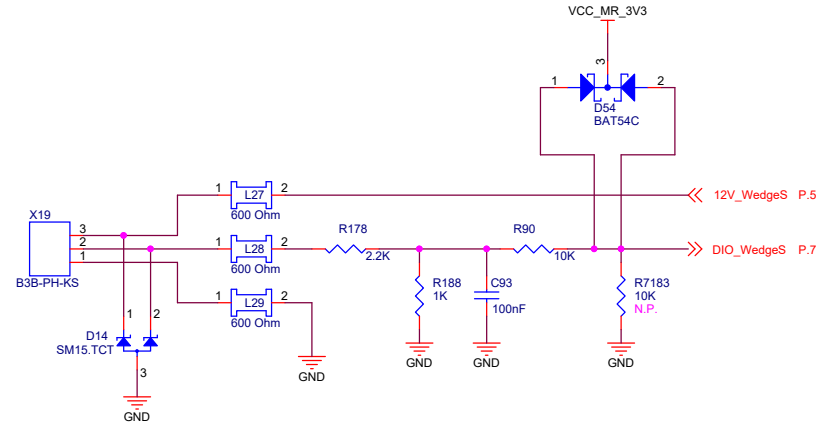
LAYOUT NOTE: use Kelvin sensing configuration (4 wires) for sensing resistors layout: R276, R277, R282, R286, R283. Tracks parasitic resistance must be limited as much as possible.

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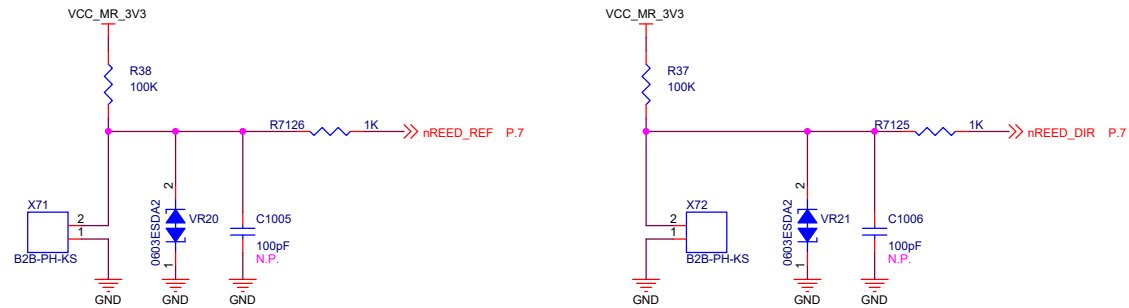
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	Author: Reuf Qereshniku	Approved by: Enrico Denna
	Size: A3	Doc. Number: HRI00047527-100-SF
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Wedge Sensor



Reed Switches



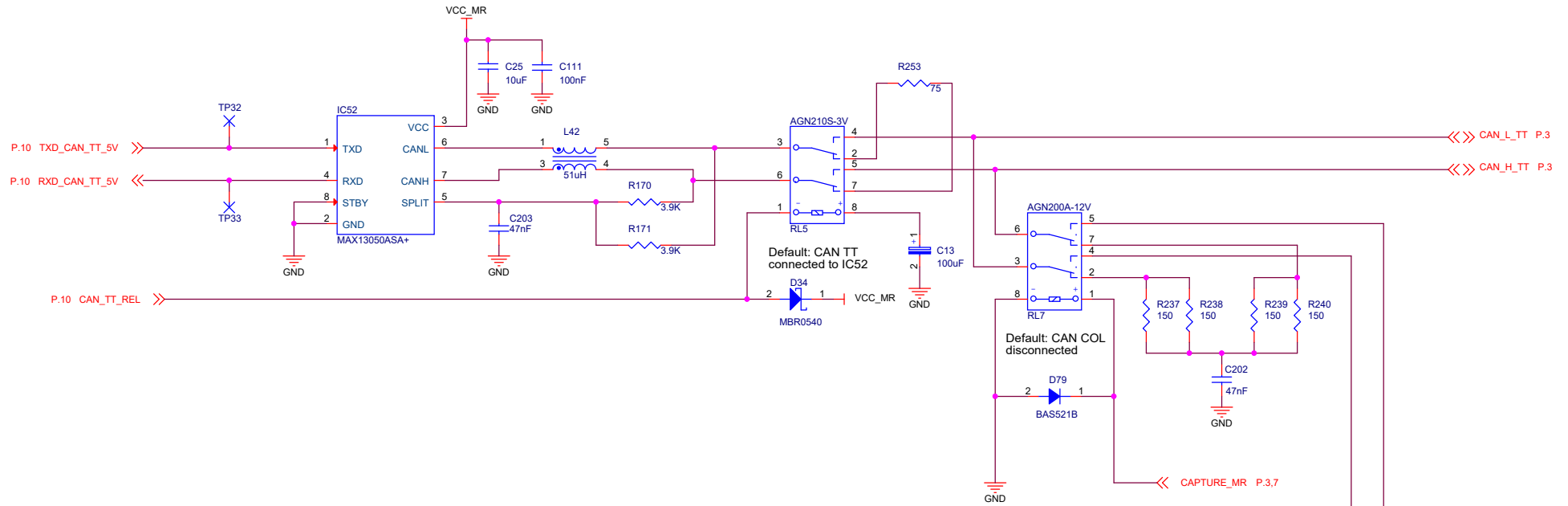
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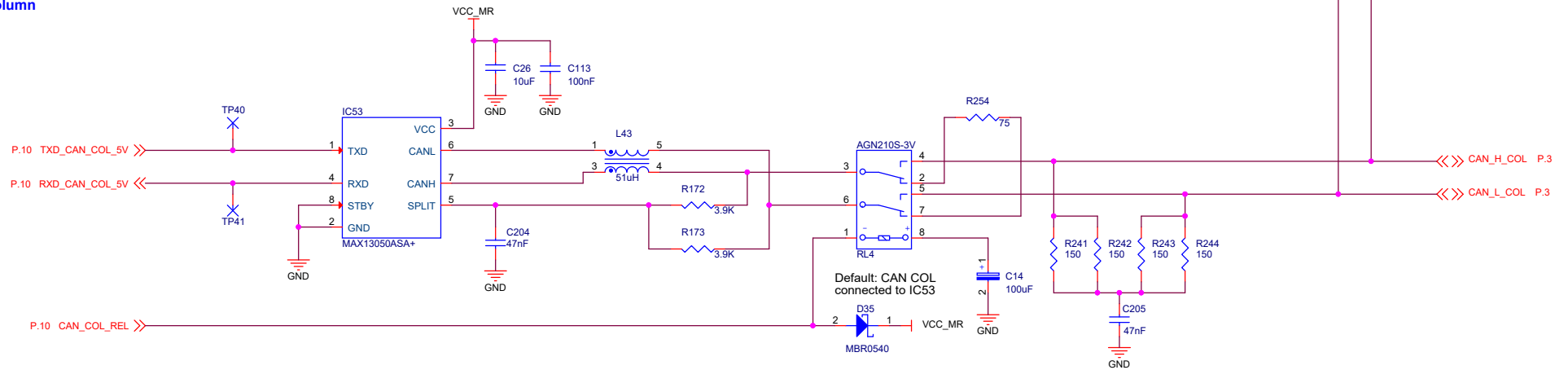
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Design Title	MOTOR CONTROLLER		
Page Title	Reed Switched & Wedge Sensor		
Author:	Reuf Qereshniku	Approved by:	Enrico Denna
Size: A3	Doc. Number: HRI00047527-100-SF	Rev:	A04
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CAN Table Top



CAN Column

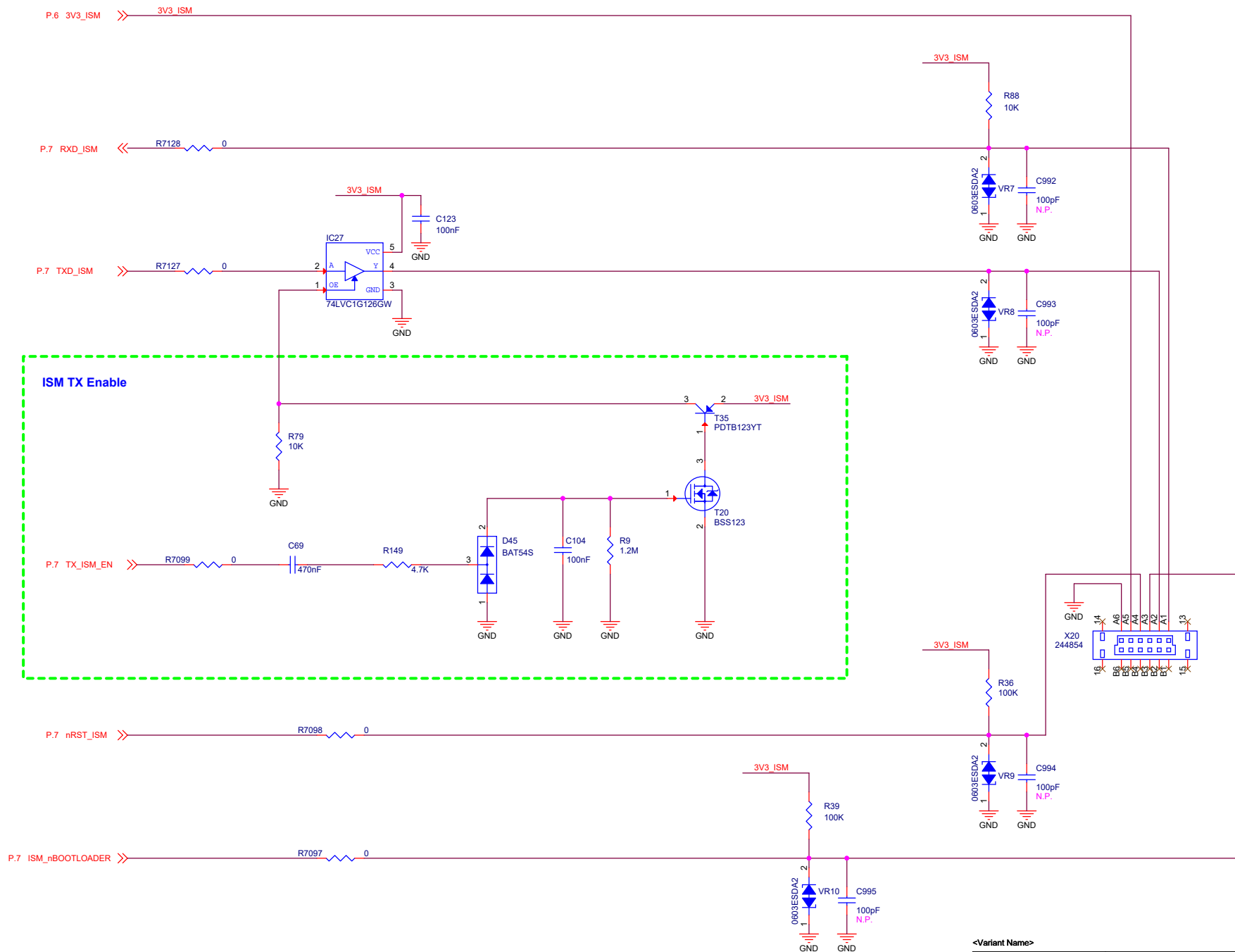


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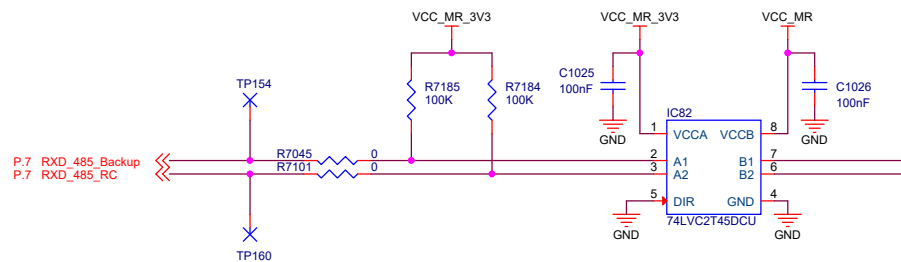
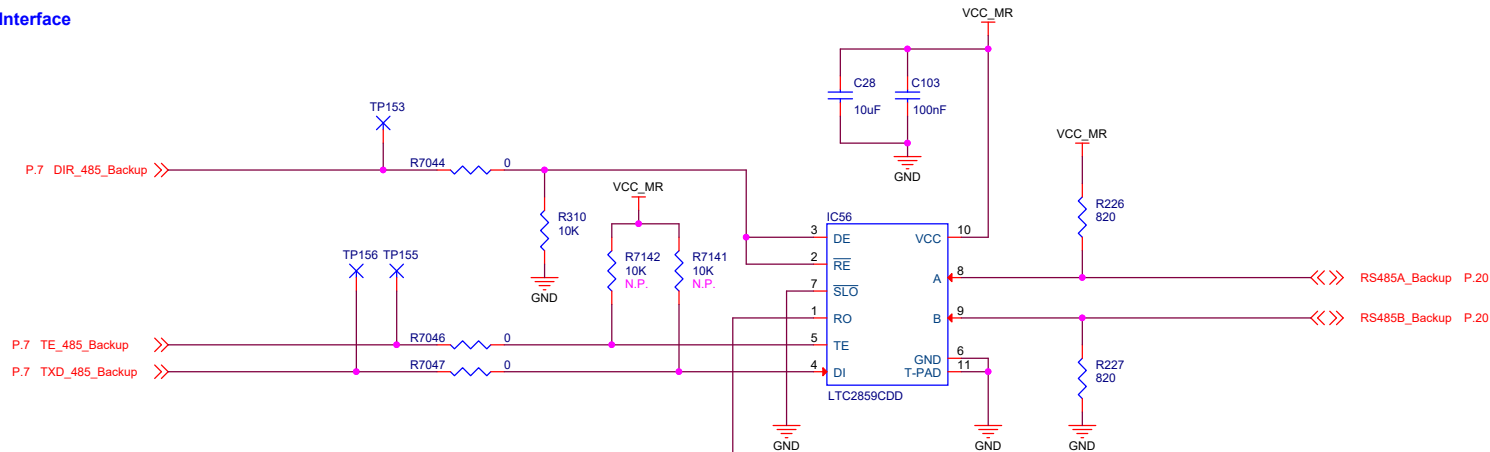
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Page Title	CAN Interface		
Author	Reuf Qereshniku	Approved by:	Enrico Denna
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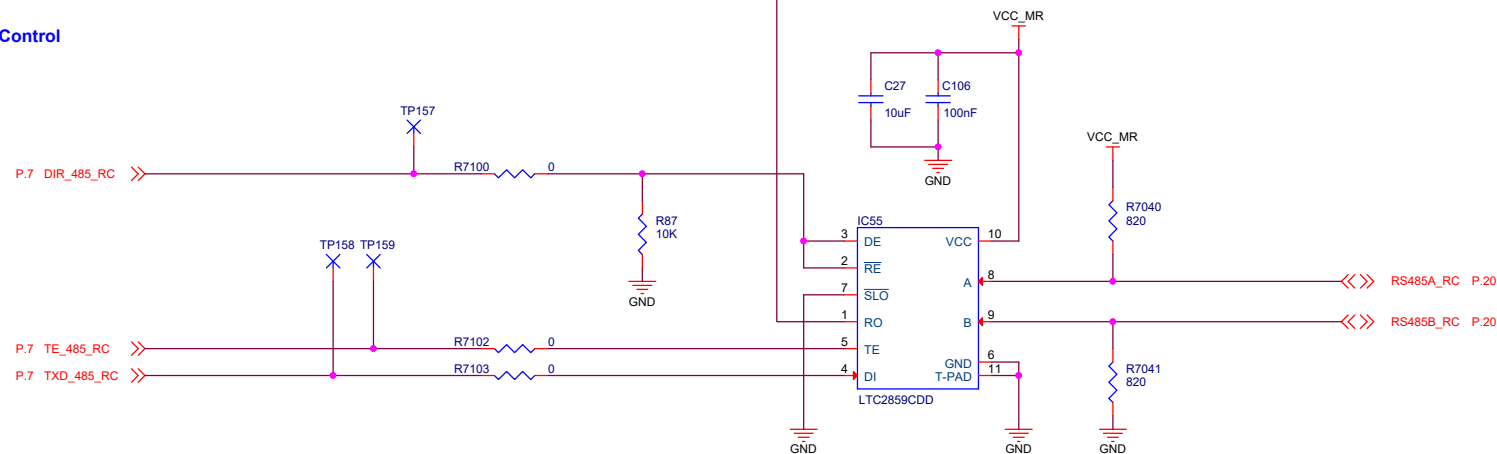
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Author:	Reuf Qereshniku	Approved by:	Enrico Denna	
Size:	A3	Doc. Number:	HRI00047527-100-SF	Rev: A04
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RS485 Backup Interface



Remote Control



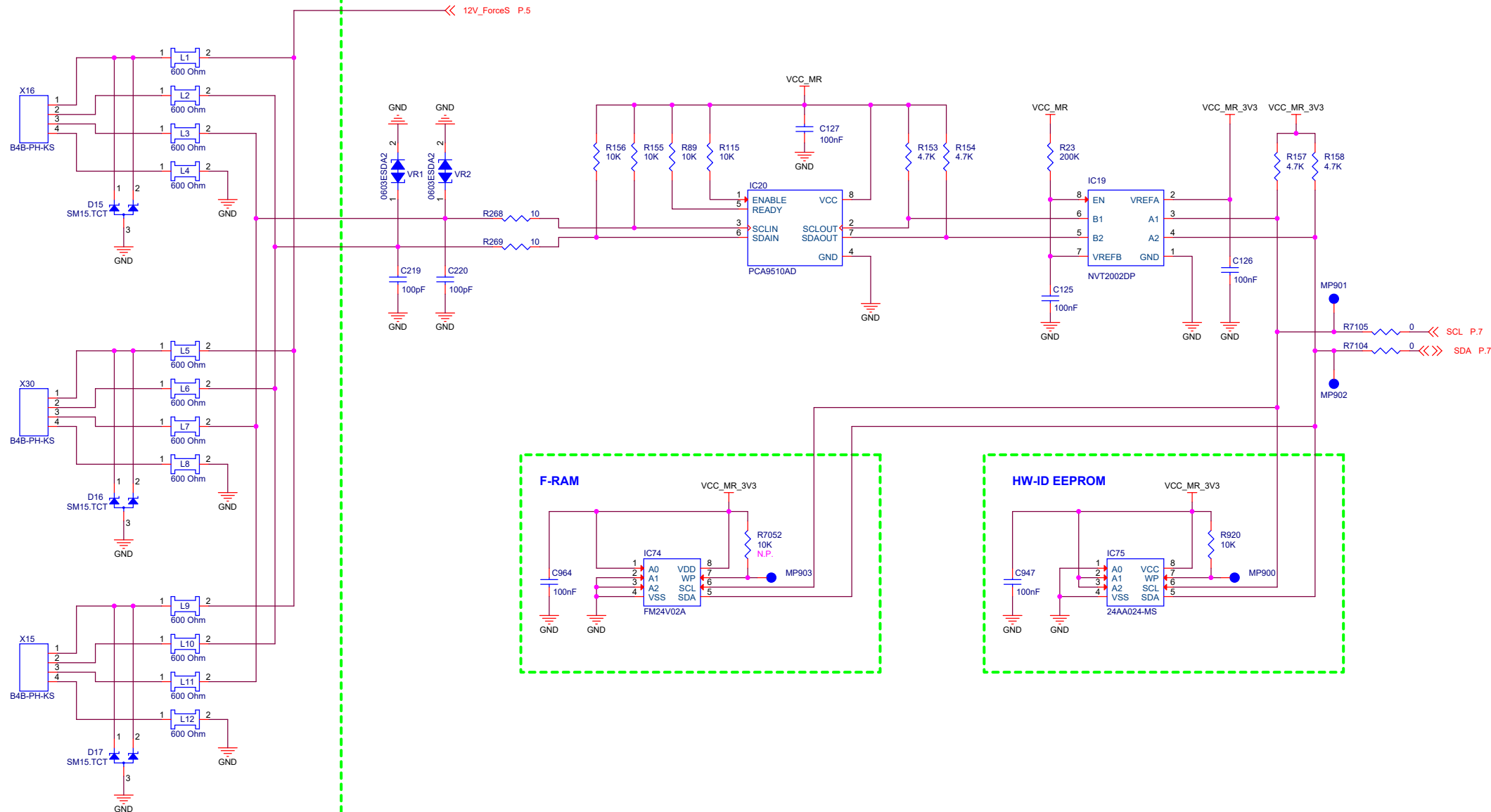
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Design Title	MOTOR CONTROLLER		
Page Title	RS485 Drivers		
Author	Reuf Qereshniku	Approved by:	Enrico Denna
Size	A3	Doc. Number:	HRI00047527-100-SF
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Force Sensors

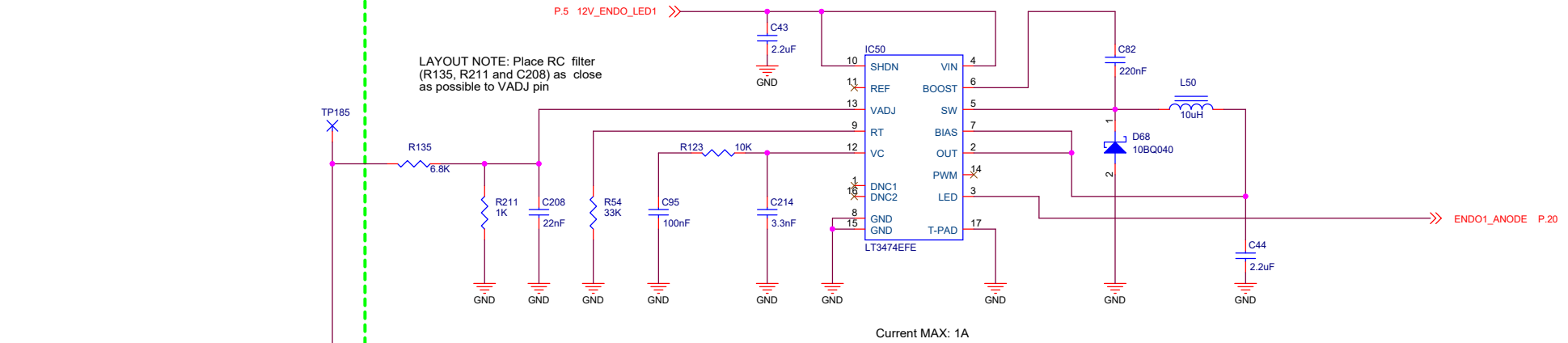


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Author:	Reuf Qereshniku	Approved by:	Enrico Denna
Size:	A3	Doc. Number:	HRI00047527-100-SF
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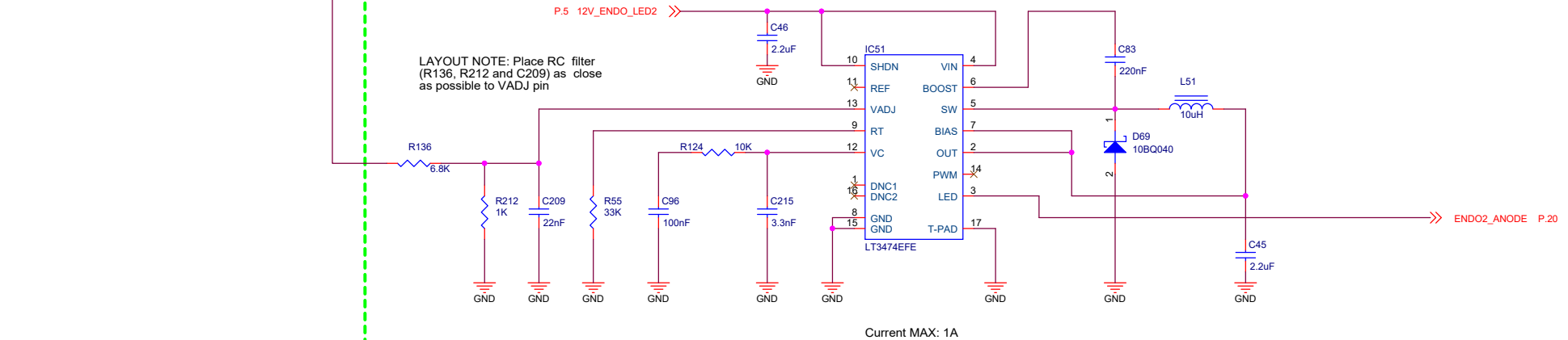
Endolight 1

LAYOUT NOTE: Place RC filter (R135, R211 and C208) as close as possible to VADJ pin



Endolight 2

LAYOUT NOTE: Place RC filter (R136, R212 and C209) as close as possible to VADJ pin

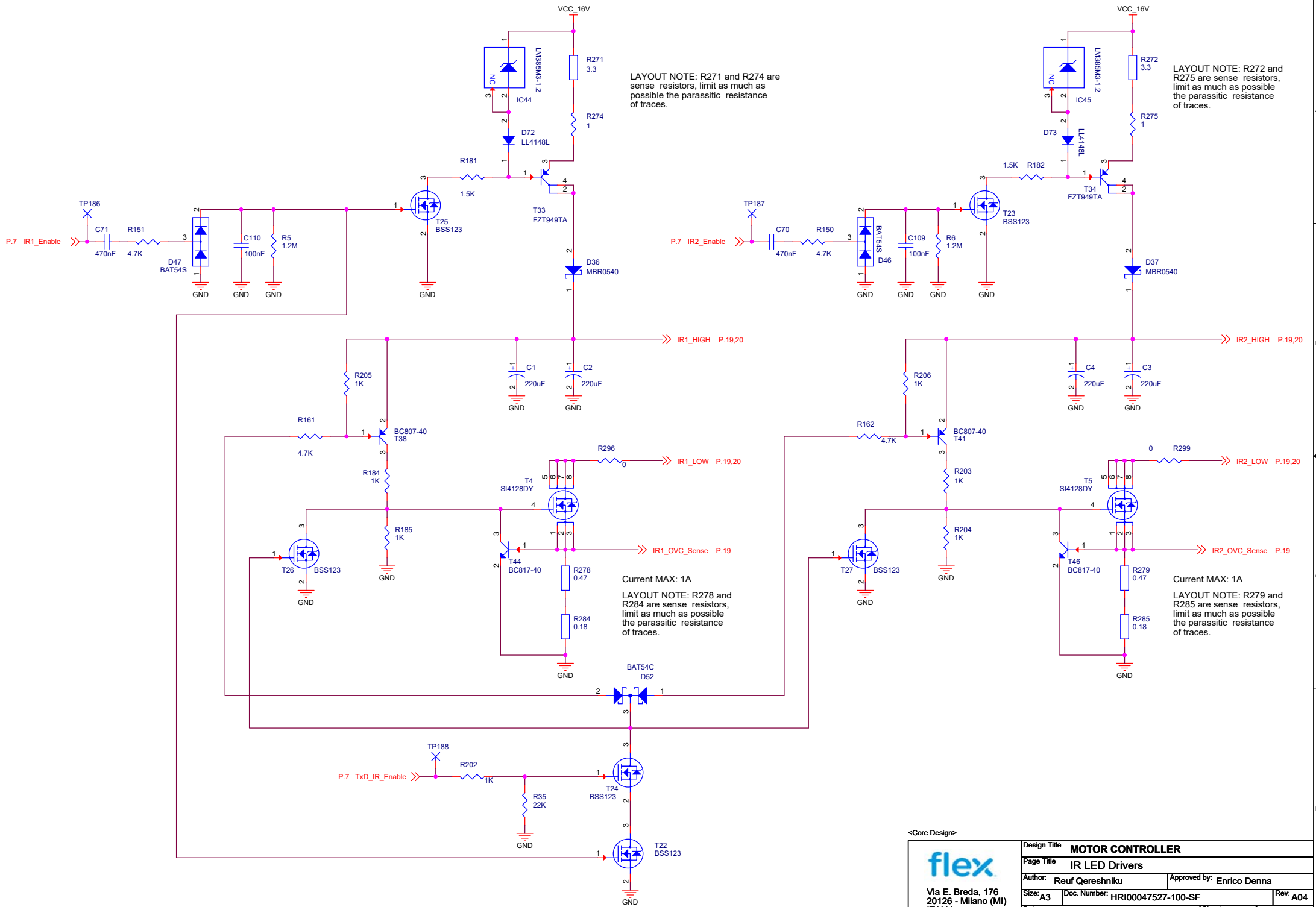


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Design Title	MOTOR CONTROLLER		
Page Title	Endolight LED Drivers		
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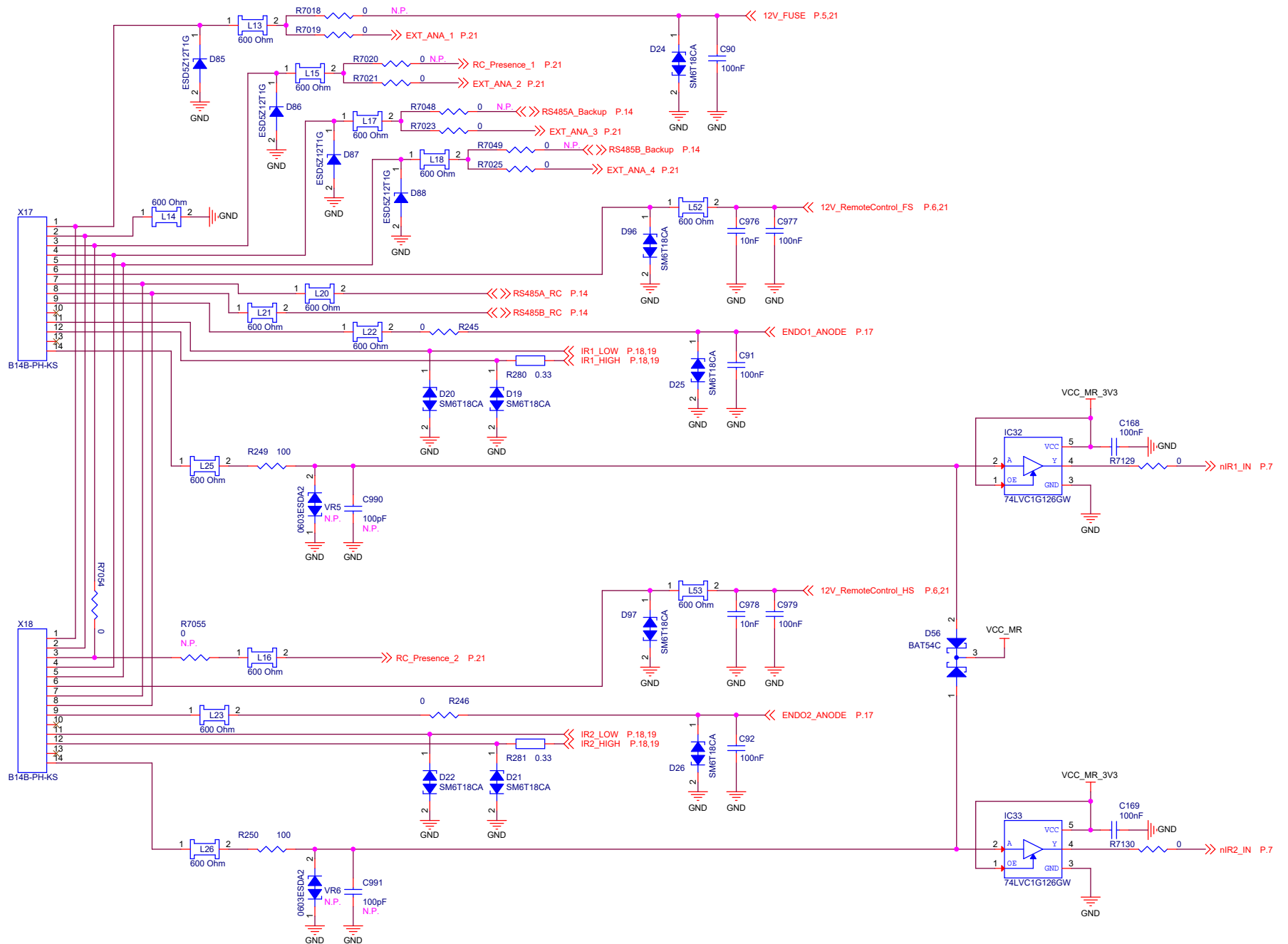
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Page Title		IR LED Drivers	
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FOOT SIDE CONNECTOR PINOUT

- Option 1: 12V_eFuse_Backup
Option 2: EXT_ANA_1
- GND
- Option 1: RC_Presence-1
Option 2: EXT_ANA_2
- Option 1: RS485A_Backup
Option 2: EXT_ANA_3
- Option 1: RS485B_Backup
Option 2: EXT_ANA_4
- 12V_Fuse
- RS485A_NEW
- RS485B_NEW
- ENDO1-ANODE
- n.c.
- IR1_LOW
- IR1_HIGH
- n.c.
- IR1_IN

HEAD SIDE CONNECTOR PINOUT

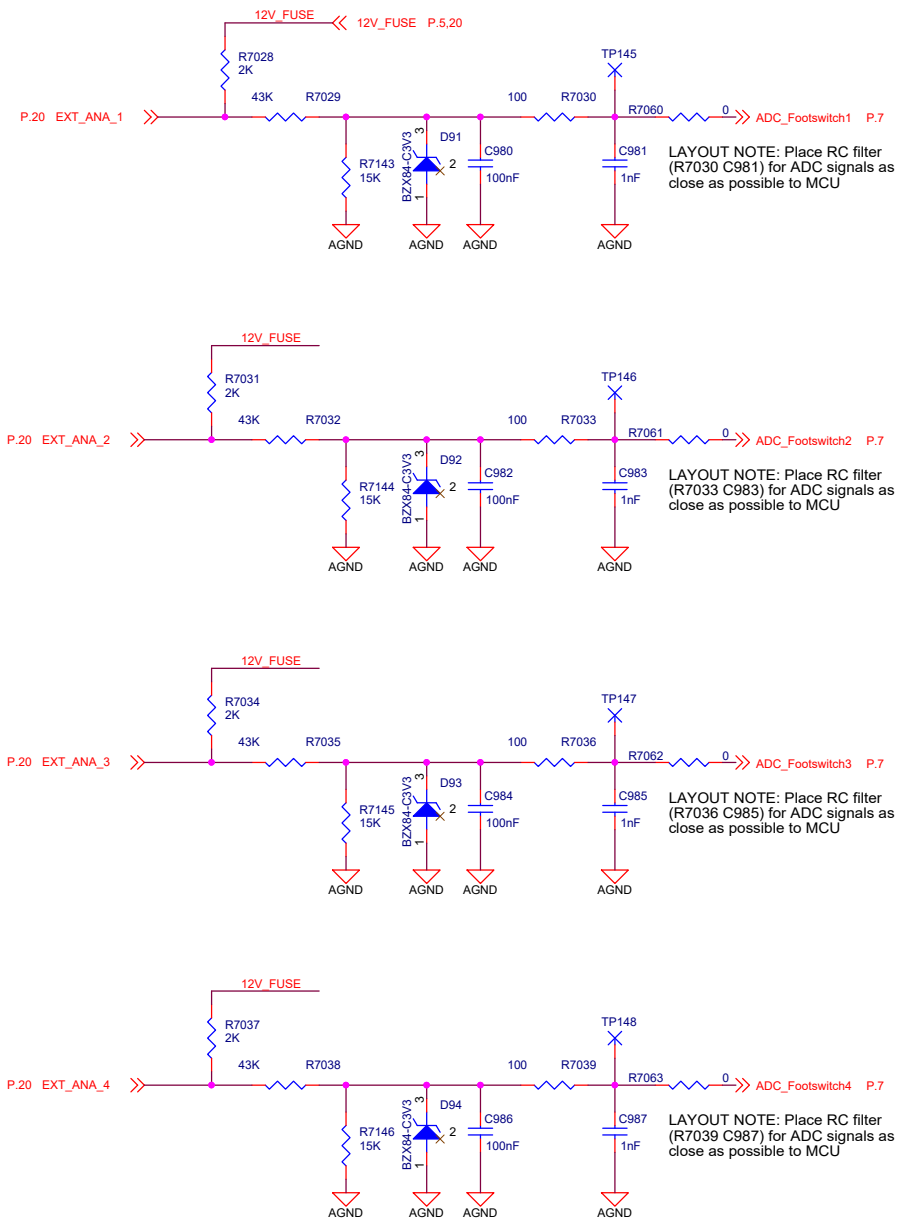
- Option 1: 12V_eFuse_Backup
Option 2: EXT_ANA_1
- GND
- Option 1: RC_Presence-2
Option 2: EXT_ANA_2
- Option 1: RS485A_Backup
Option 2: EXT_ANA_3
- Option 1: RS485B_Backup
Option 2: EXT_ANA_4
- 12V_Fuse
- RS485A_NEW
- RS485B_NEW
- ENDO2-ANODE
- n.c.
- IR2_LOW
- IR2_HIGH
- n.c.
- IR2_IN



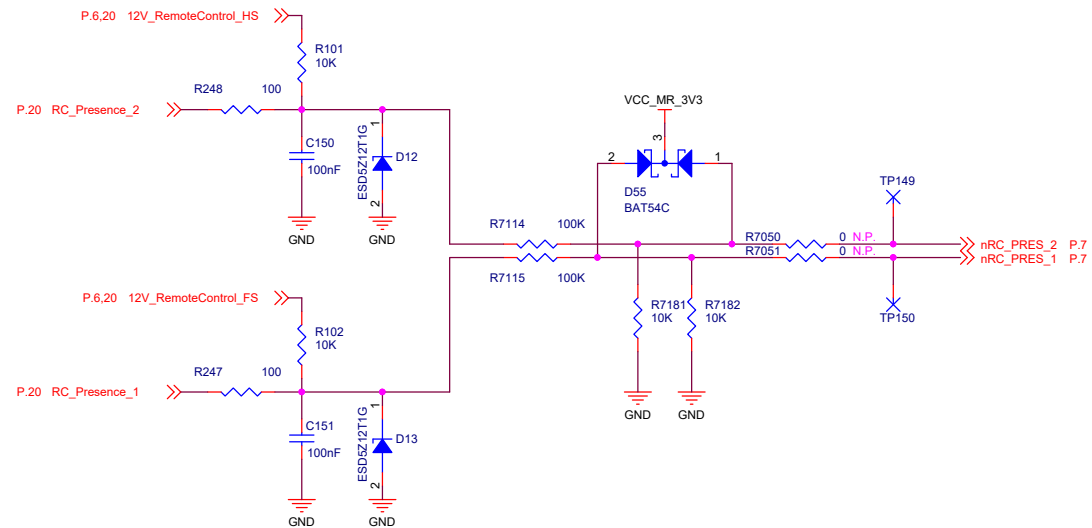
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Page Title RS485 / IR / Endolight Int		Author Reuf Qereshniku
Size A3		Doc. Number HRI00047527-100-SF
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Footswitch



RC Presence

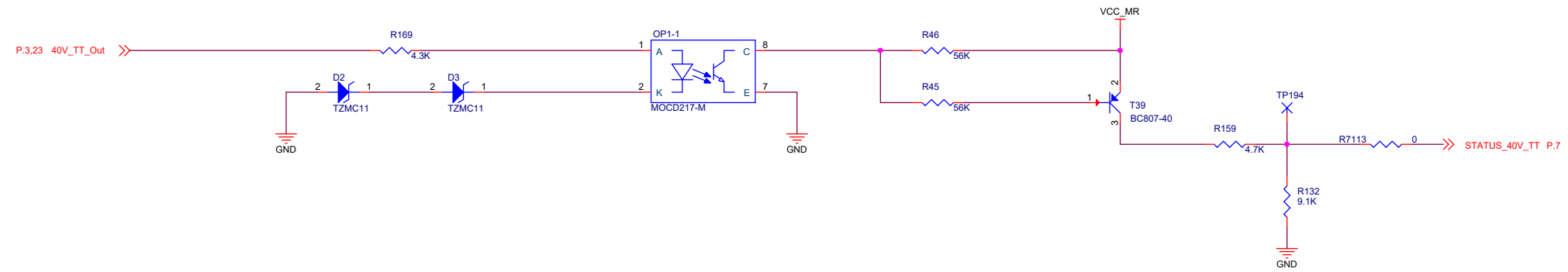
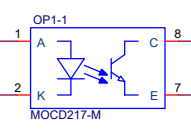
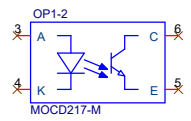


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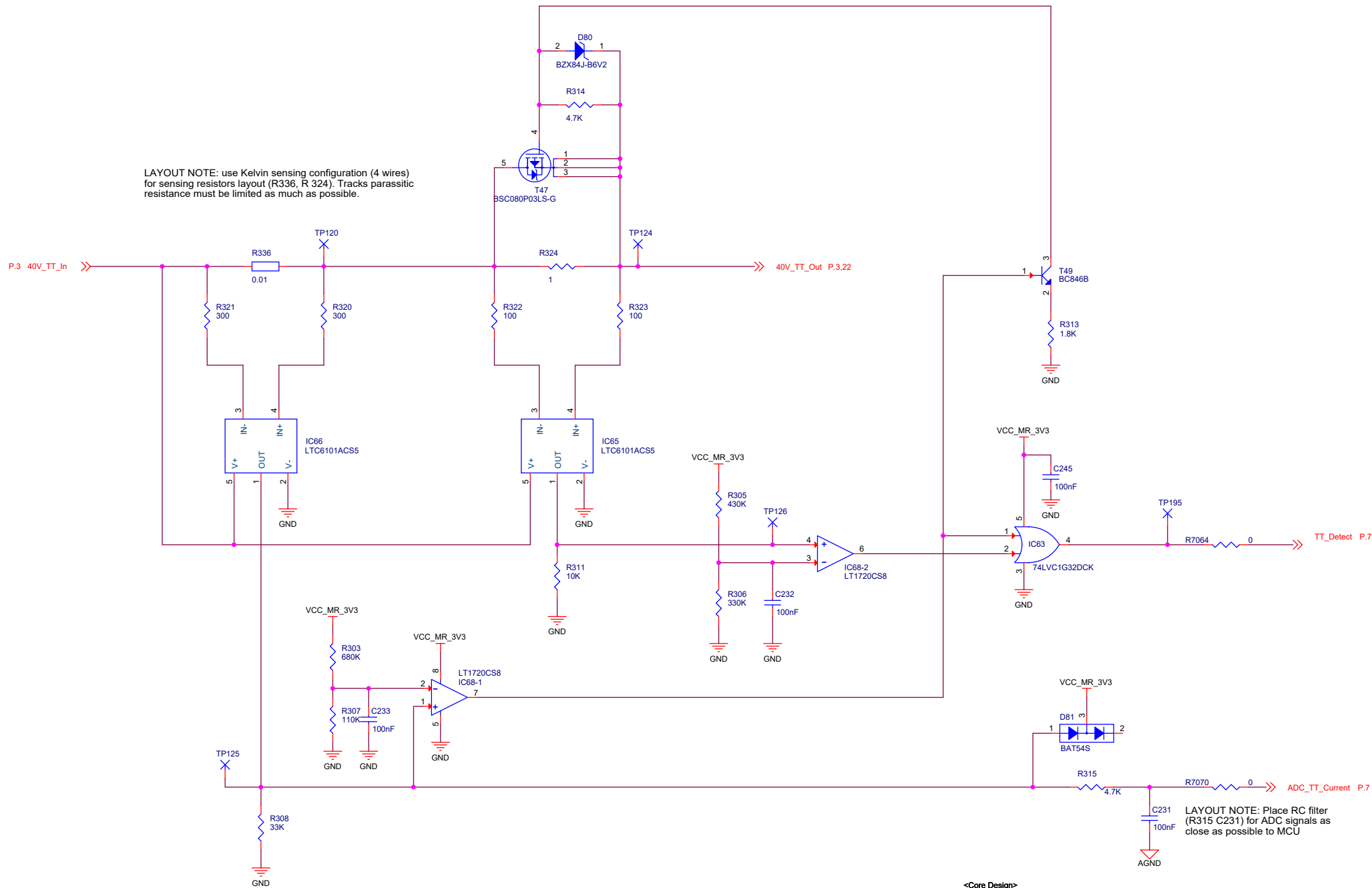
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Author	Reuf Qereshniku	Approved by:	Enrico Denna
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Design Title		MOTOR CONTROLLER	
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