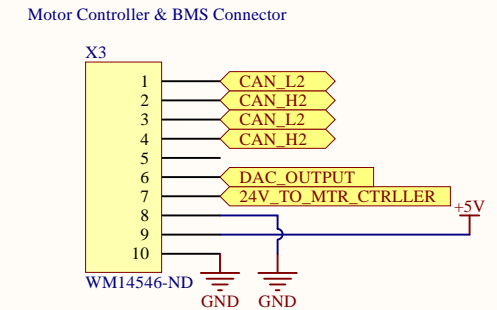
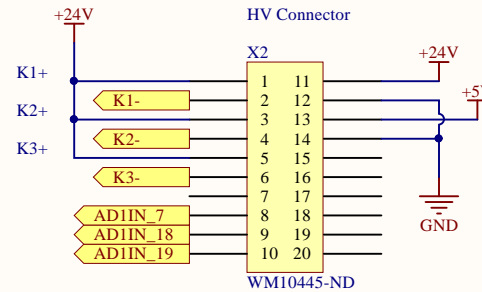
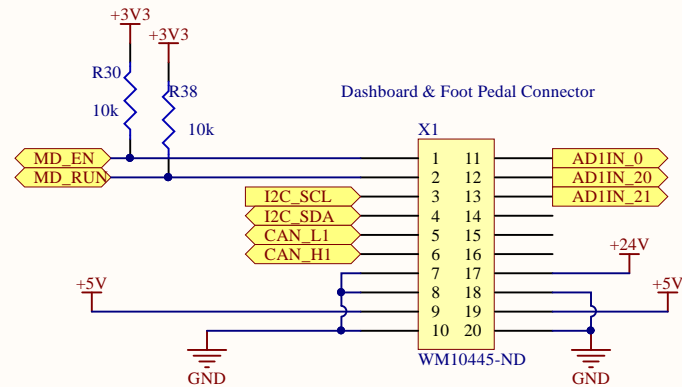
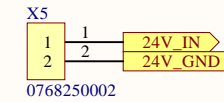
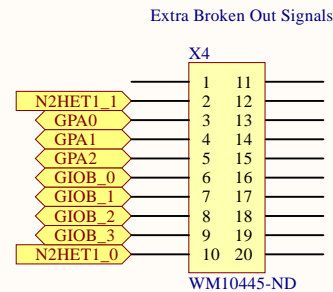


CONNECTORS



GPIO PIN MUX : -----		
PORT A :		
(INPUT)	0 :	MD_EN
(INPUT)	1 :	MD_RUN
(OUTPUT)	2 :	MTR_EN
(OUTPUT)	5 :	(Pre_Charge)
(OUTPUT)	6 :	(High_Voltage)
(OUTPUT)	7 :	(Ground)
PORT B :		
(INPUT)	0 :	Limit Switch
(INPUT)	1 :	S_BMS
(INPUT)	2 :	
(INPUT)	3 :	
ADC : -----		
ADC 1 Group 1 :		
PIN 0 : Throttle Input from Foot Pedal		
PIN 7 : Voltage Transducer Analog Signal		
PIN 18: Current Transducer Low Signal		
PIN 19: Current Transducer High Signal		
PIN 20:		

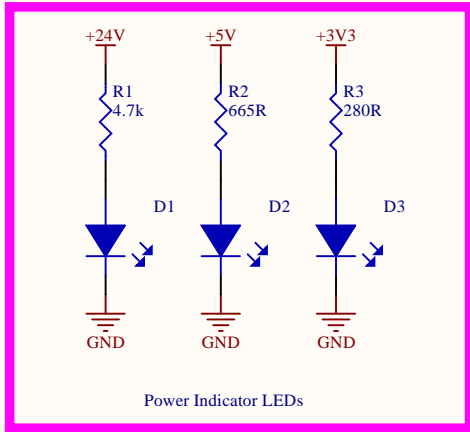


DESIGN NOTE:

Breaking out rails to power external components (Voltage Transducer, Current Transducer, LCDs, Enable Switches)

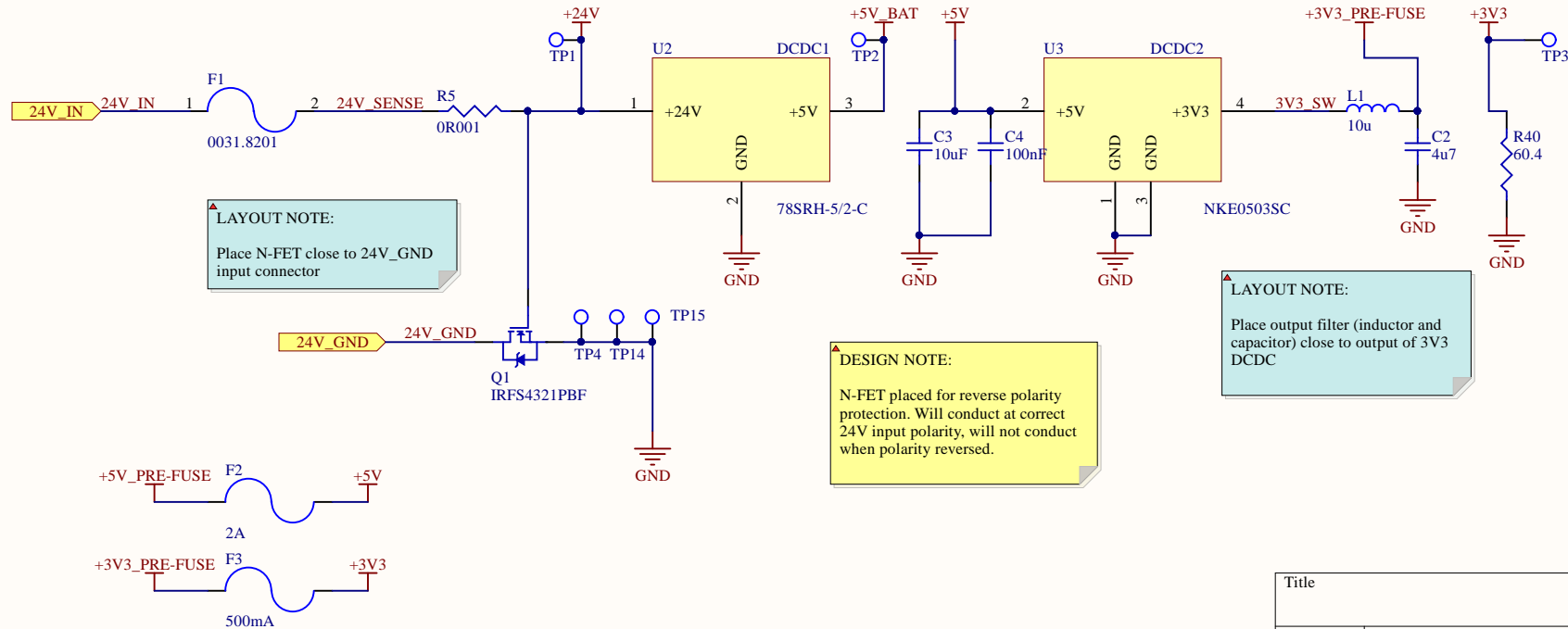
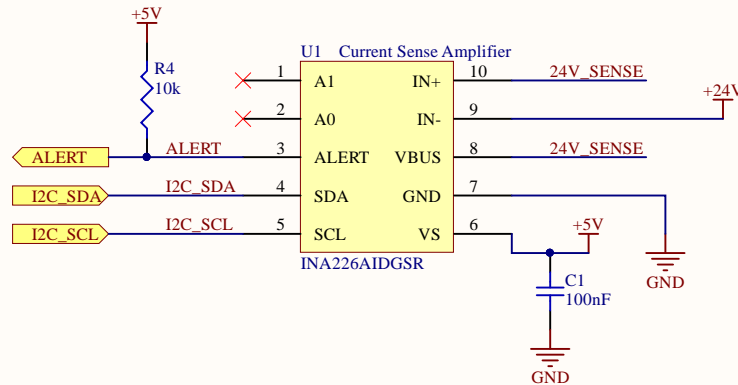
Title		
Size	Number	Revision
A4		
Date:	2018-02-21	Sheet of
File:	C:\Users\...\Connectors.SchDoc	Drawn By:

POWER & CURRENT SENSING



LAYOUT NOTE:

Place sensing wires (IN+, IN-) in a Kelvin connection to the shunt resistor
Route sensing wires as a differential pair



DESIGN NOTE:

Output resistor for minimum load requirement. DCDC needs min. 10% load otherwise voltage output isn't 3.3V

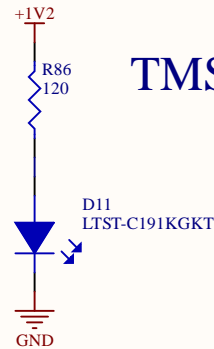
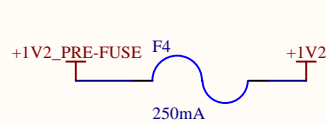
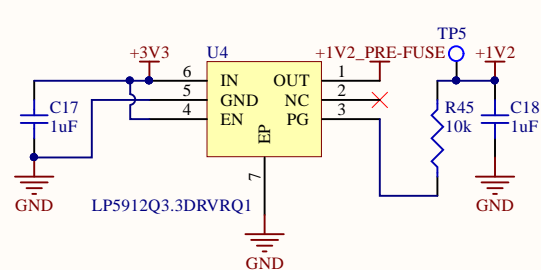
LAYOUT NOTE:

Place output filter (inductor and capacitor) close to output of 3V3 DCDC

DESIGN NOTE:

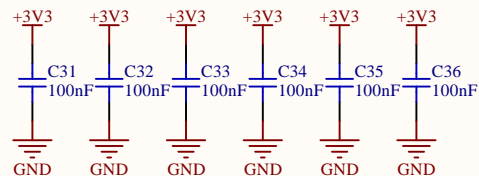
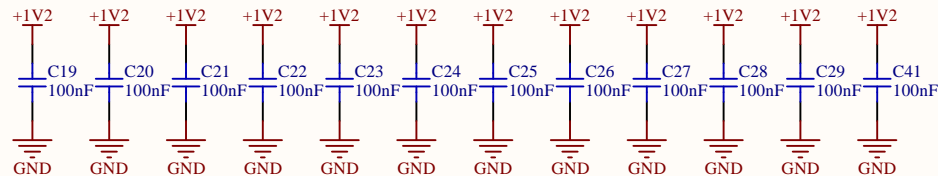
N-FET placed for reverse polarity protection. Will conduct at correct 24V input polarity, will not conduct when polarity reversed.

Title		
Size A4	Number	Revision
Date:	2018-02-21	Sheet of
File:	C:\Users\...\Power_Sensing_SchDoc	Drawn By:

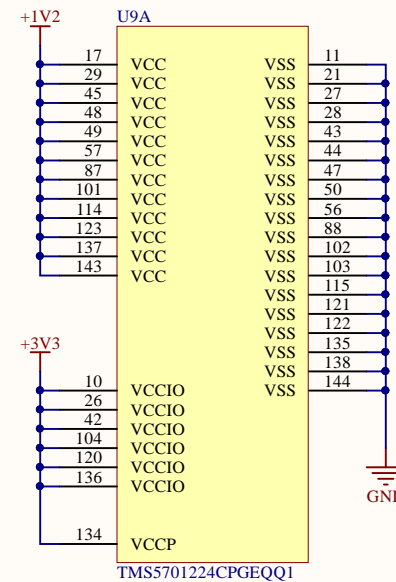
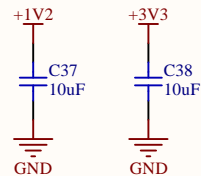


TMS570 POWER

DESIGN NOTE:
Decoupling capacitors help reduce the transients seen by the MCU on the power input pins



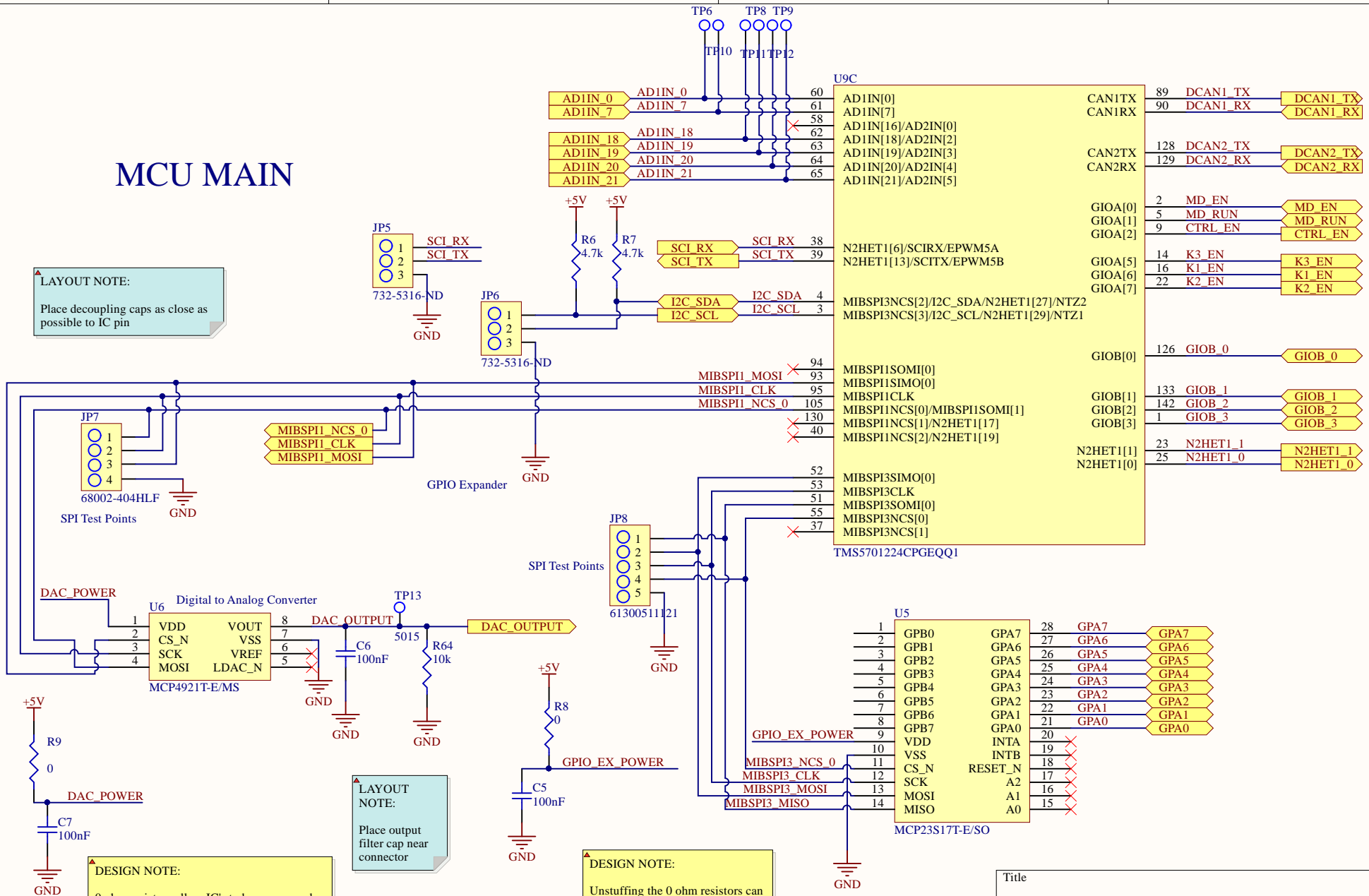
LAYOUT NOTE:
Place decoupling caps as close as possible to IC pin, on each power



Title			
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File:	C:\Users\...\Power_MCU.SchDoc		Drawn By:

MCU MAIN

LAYOUT NOTE:
Place decoupling caps as close as possible to IC pin



Title		
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File:	C:\Users\...\VCU_Schematic.SchDoc	Drawn By:

CAN TRANSCEIVERS

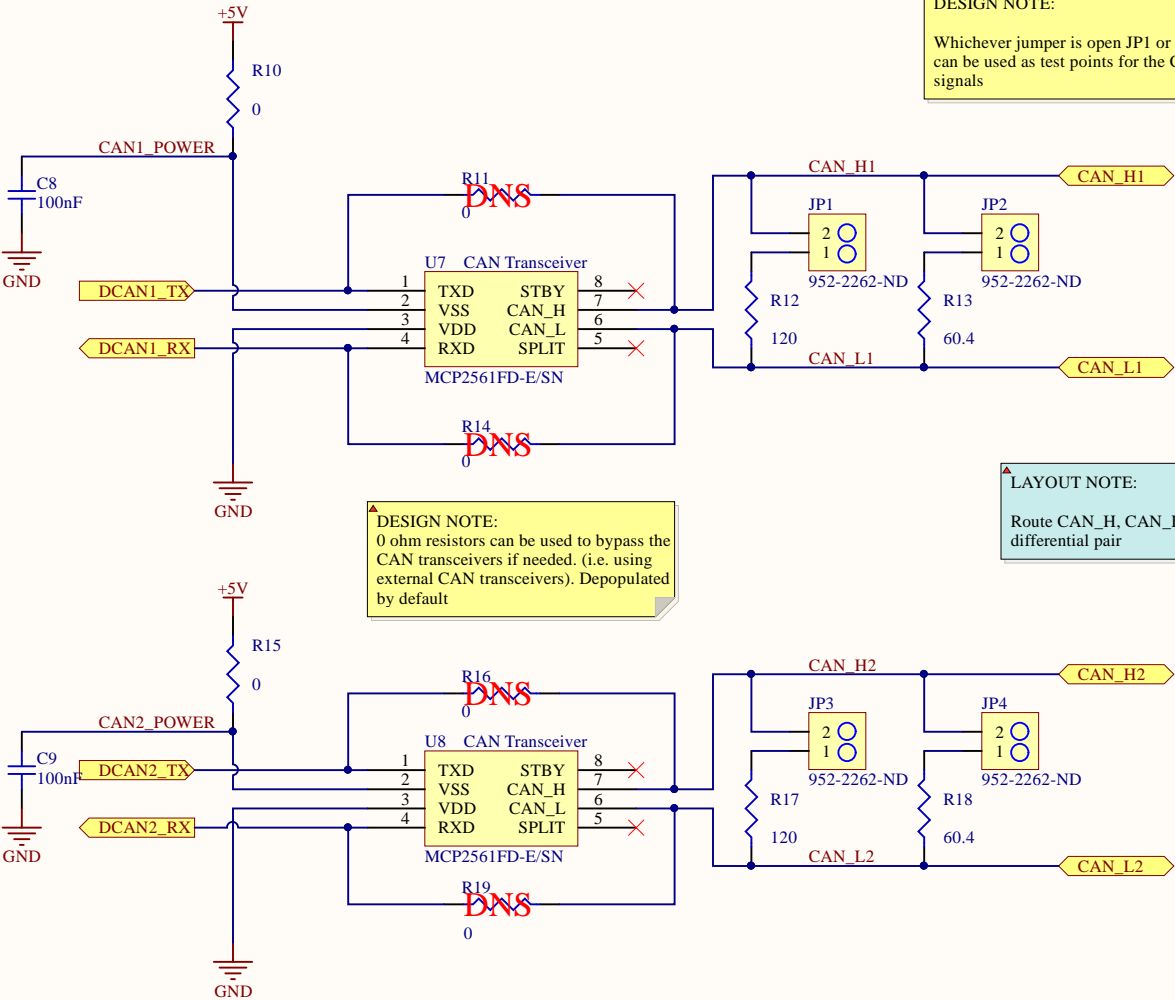
DESIGN NOTE:
0 ohm resistors allow IC's to be unpowered and unused if needed. (i.e. don't need them or they draw too much power)

LAYOUT NOTE:
Place decoupling caps as close as possible to IC pin

DESIGN NOTE:
Whichever jumper is open JP1 or JP2, can be used as test points for the CAN signals

DESIGN NOTE:
0 ohm resistors can be used to bypass the CAN transceivers if needed. (i.e. using external CAN transceivers). Depopulated by default

LAYOUT NOTE:
Route CAN_H, CAN_L signals as differential pair

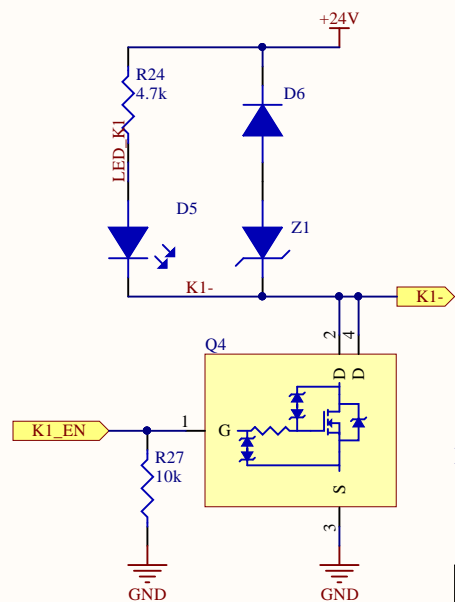
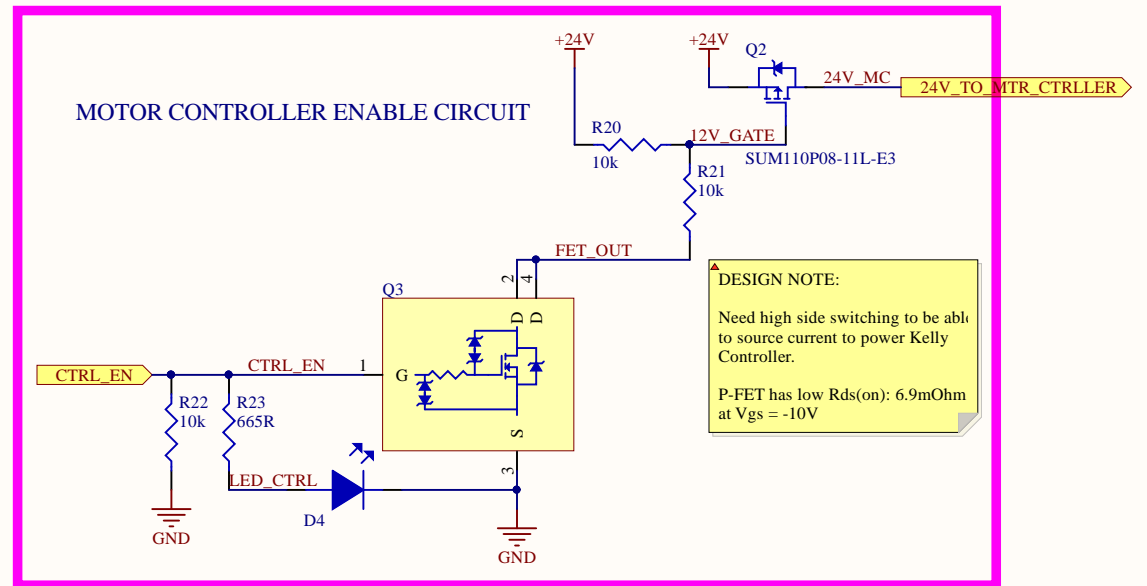


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File:	C:\Users\...\CAN.SchDoc	Drawn By:

LOW SIDE CONTACTOR SWITCHING

▲ DESIGN NOTE:

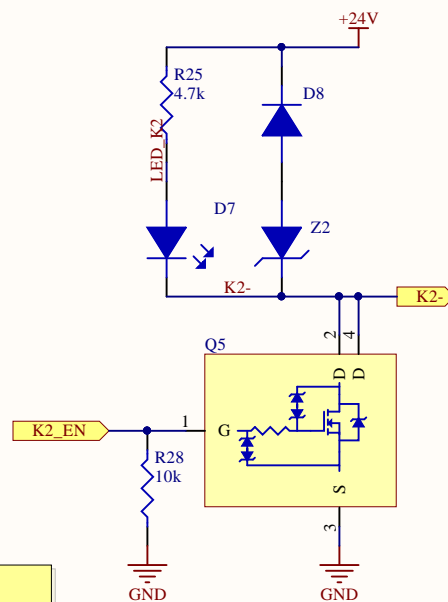
Diode-Zener snubber acts as a good way to dissipate inductive voltage kicks when the contactor opens



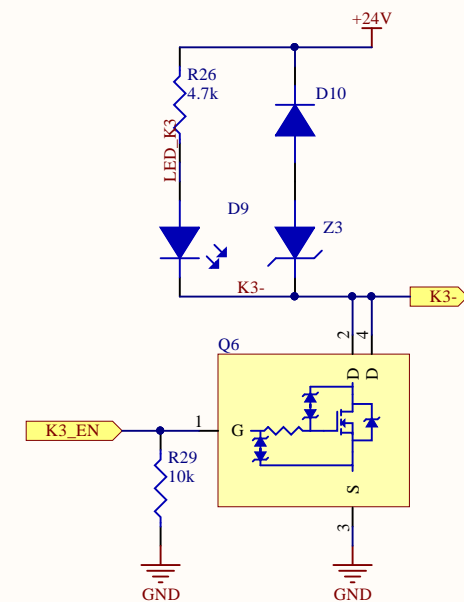
B+ LINE

DESIGN NOTE:

Automotive FETs are protected from ESD and overvoltage



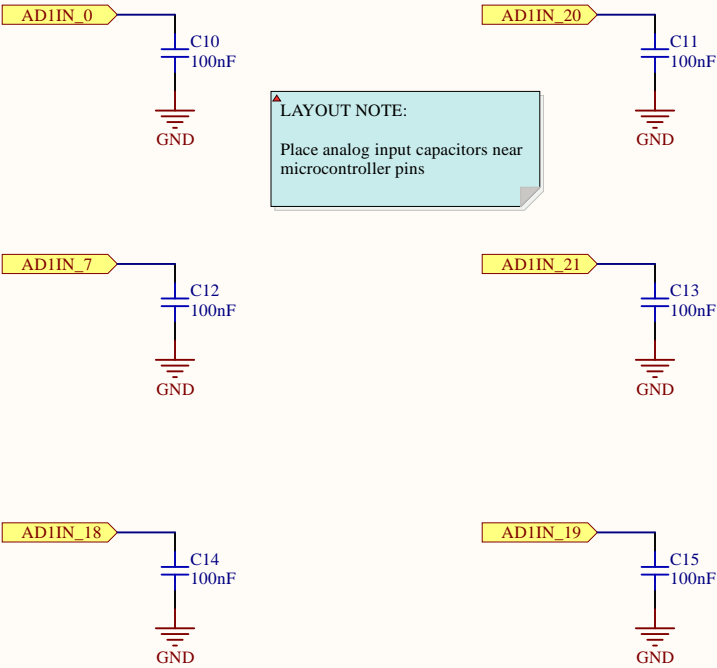
B- LINE



PRECHARGE

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File:	C:\Users\...\Contactor Switching.SchDoc Drawn By:	

ADC DECOUPLING



Title		
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Date:	2018-02-21	Sheet of
File:	C:\Users\...\ADC_Decoupling.SchDoc	Drawn By:

