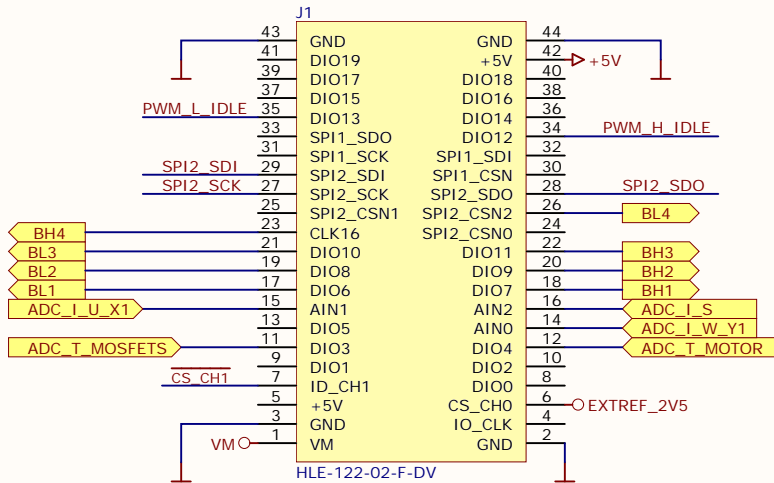
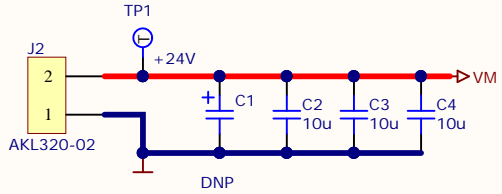


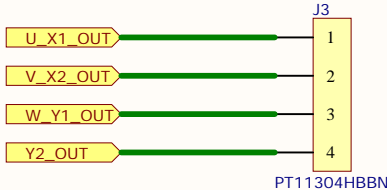
uC or Motor Controller Connector



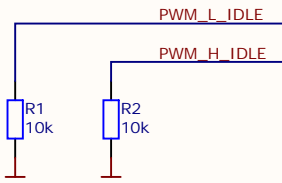
Power Connector



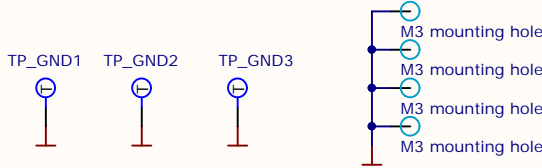
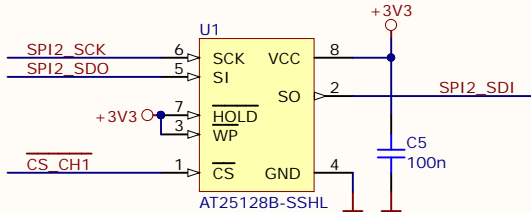
Motor Connector



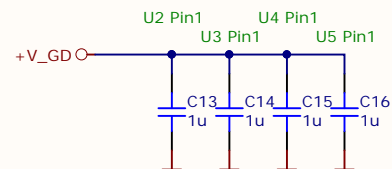
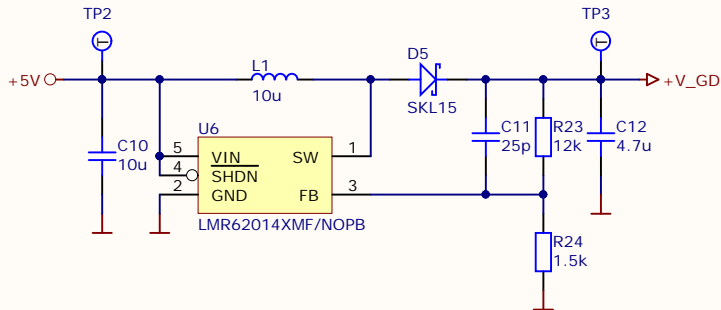
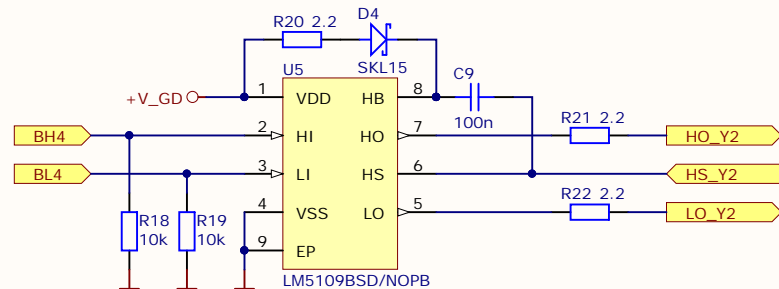
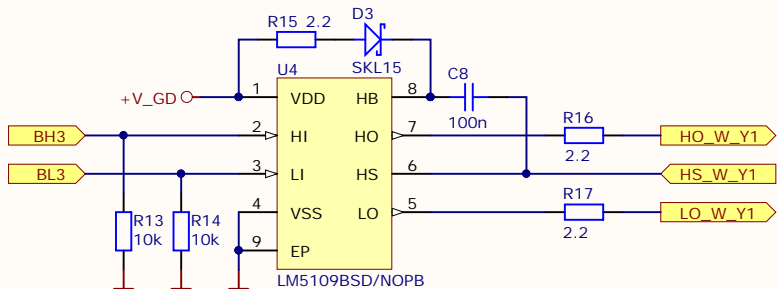
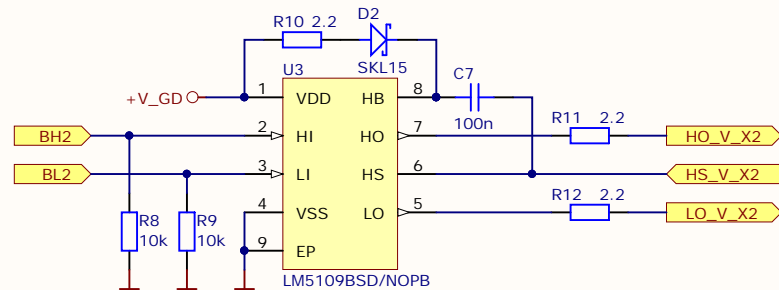
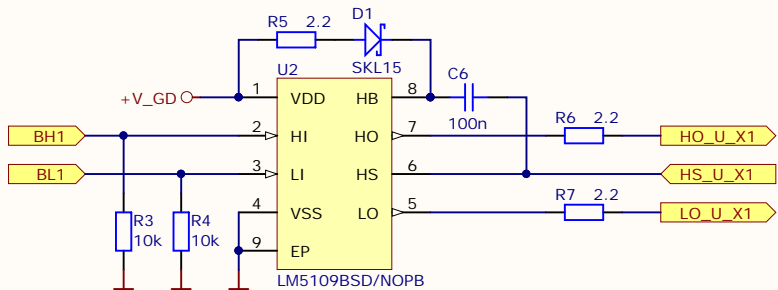
Bridge Idle State



Ident EEPROM



MOSFET Predrivers



Title **UPS 2A/24V A EVAL Predrivers**

Size: **A4**

Revision: **V1.0**

[No Variations]

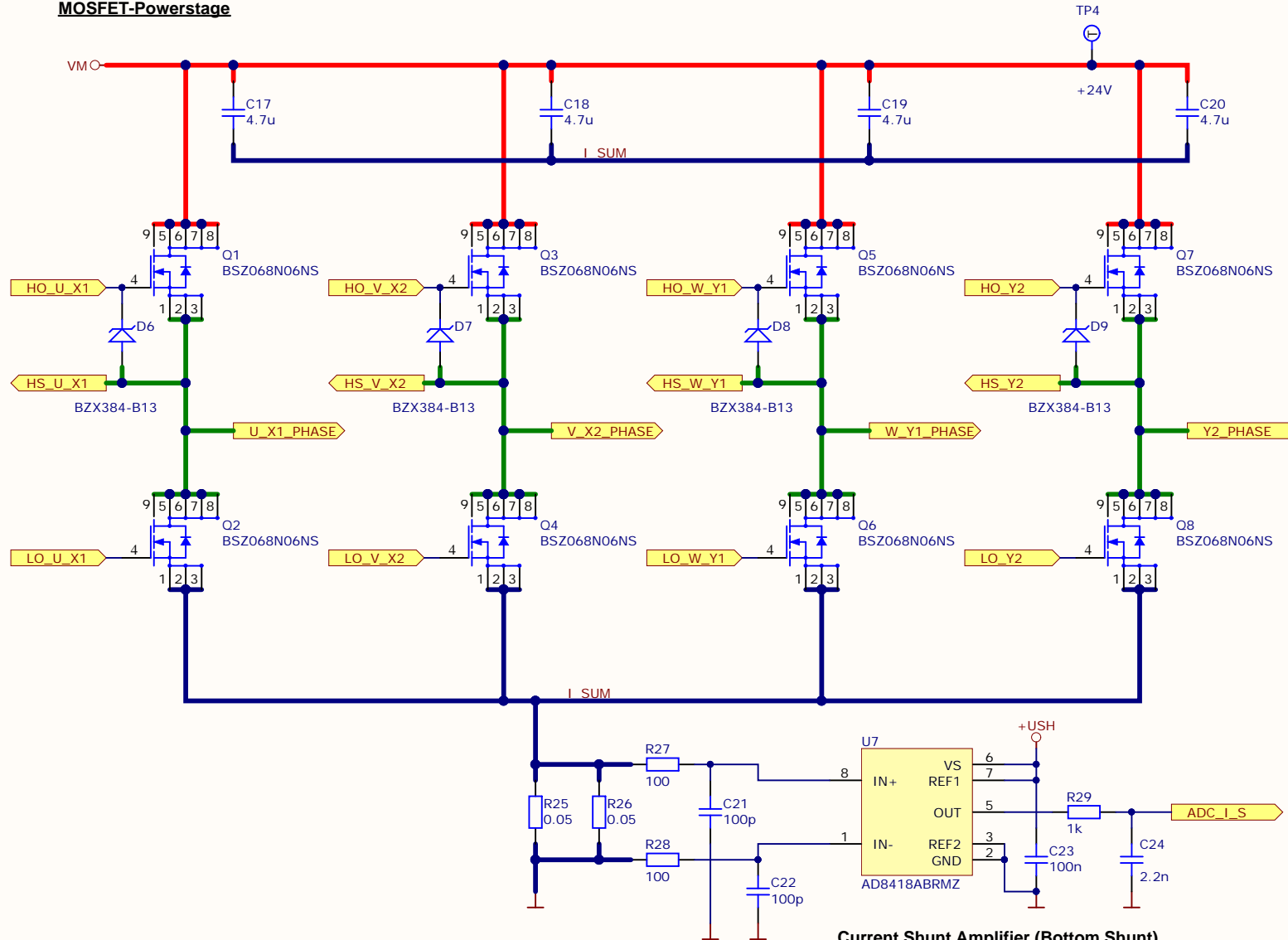
Date: 14.04.2019 Time: 16:40:23 Sheet 2 of 6

File: TMC-UPS-2A24V-A-EVAL_V10_Predriver.SchDoc

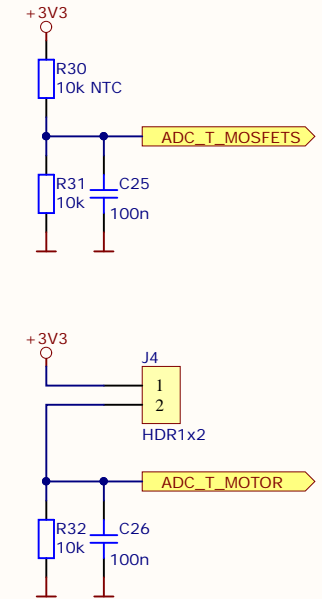


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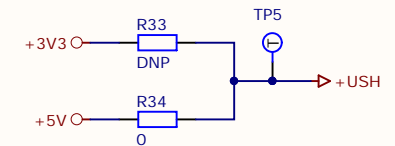
MOSFET-Powerstage



Temp sensing



Shunt Amplifier power select (default +5V)



Current Shunt Amplifier (Bottom Shunt)

Title UPS 2A/24V A EVAL MOSFETs		
Size: A4	Revision: V1.0	[No Variations]
Date: 14.04.2019	Time: 16:40:23	Sheet 3 of 5
File: TMC-UPS-2A24V-A-EVAL V10 MOSFETs.SchDoc		


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Power Sense

U_X1_PHASE

V_X2_PHASE

W_Y1_PHASE

Y2_PHASE

Power limit for 0.25W current sense resistors

$$50\text{m}\Omega / 2 = 25\text{m}\Omega$$

$$2\text{A} \cdot 25\text{m}\Omega = 50\text{mV}$$

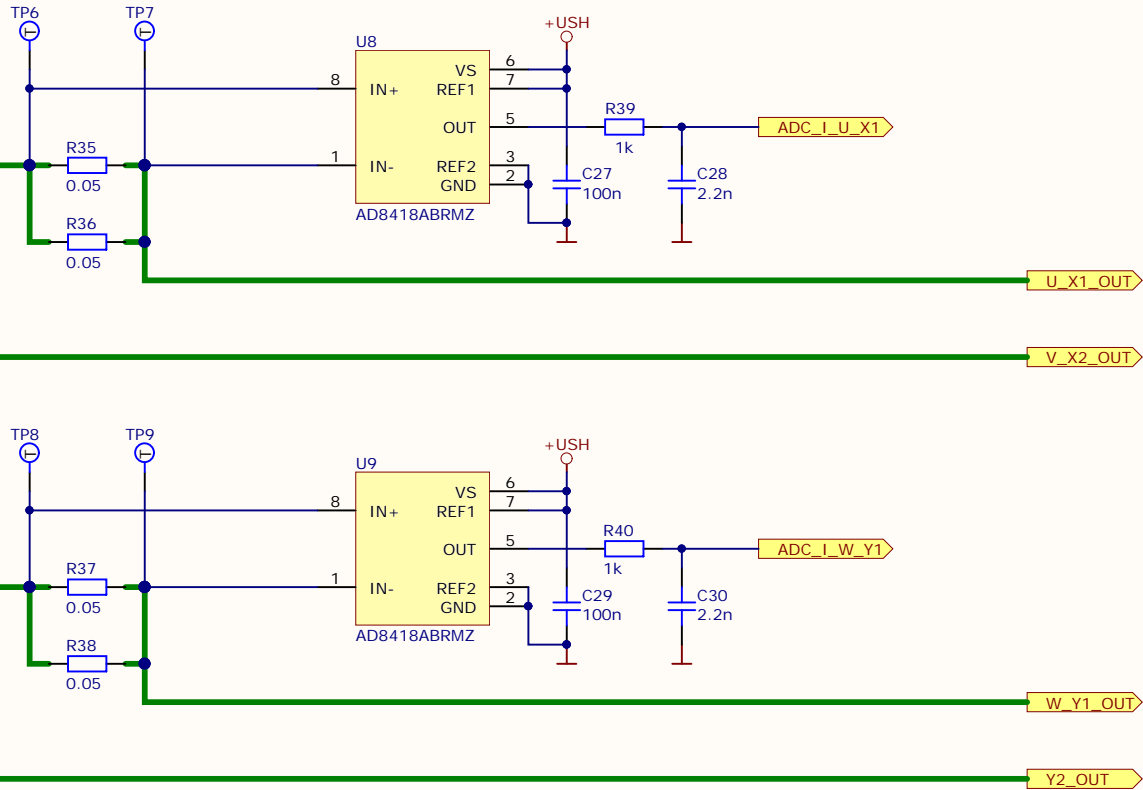
$$2\text{A} \cdot 50\text{mV} = 0.1\text{W} < 2 \times 0.25\text{W}$$

Voltage pass for current sense

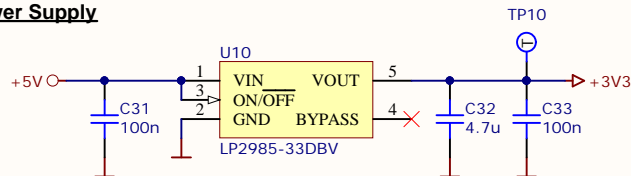
$$\text{AD8418 } G=20$$

$$50\text{mV} \cdot 20 = 1\text{V}$$

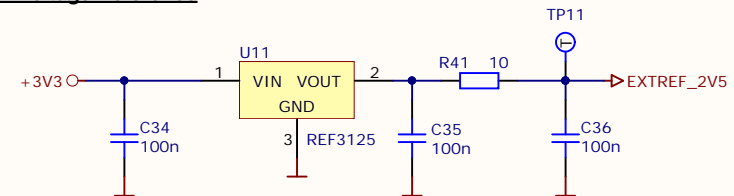
AD8418 input range VCC - 20mV - ok



3.3V Power Supply



Ext 2.5V Voltage Reference



Title **UPS 2A/24V A EVAL Power Sense**

Size: **A4**

Revision: **V1.0**




[No Variations]

Date: **14.04.2019** Time: **16:40:23** Sheet **4** of **5**

File: **TMC-UPS-2A24V-A-EVAL_V10_Power_Sense_SchDoc**



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1		2		3		4															
A	<p>UPS_2A_EVAL-V1.1 -> TMC-UPS-2A24V-A-EVAL-V1.0</p> <p>1. Created renamed project with files</p> <p>2. Swap for resistors R33 & R34</p> <p>UPS_2A_EVAL-V1.0 -> UPS_2A_EVAL-V1.1</p> <p>1. Changed shunt resistors to 0.05 Ohm</p> <p>UPS_2A_EVAL-V0.91 -> UPS_2A_EVAL-V1.0</p> <p>1. Changed J2 to produced by Metz Connect AKL320-02</p> <p>2. Added pull-down resistors to gate inputs on Predriver sheet, renumbered resistors</p> <p>3. Changed C6-C9 voltage from 100V to 50V</p> <p>4. Changed D1-D5 to SKL15, corrected polarity</p>		ToDo:				A														
B	<p>UPS_2A_EVAL-V0.9 -> UPS_2A_EVAL-V0.91</p> <p>1. Corrected log sheet</p> <p>2. Moved input power capacitors to Main sheet</p> <p>3. Renumbered C13 to C1 with DNP sign</p> <p>4. Replaced C14 with three 10uF 35V capacitors</p> <p>5. Renumbered all capacitors</p> <p>UPS_10A_EVAL-V0.91 -> UPS_2A_EVAL-V0.9</p> <p>1. Deleted SPI_ADC signal names from J1</p> <p>2. Changed Q1-Q8 to BSZ068N06NS</p> <p>3. Changed current sense resistors to 0.1 Ohm 0.25W</p> <p>4. Changed aluminium elkos C13,C14 to 680uF 35V</p> <p>5. Changed capacitors C15-C18 to 4.7uF 50V</p> <p>UPS_10A_EVAL-V0.9(pre3) -> UPS_10A_EVAL-V0.91</p> <p>1. Deleted unused on board SPI_ADC signals from J1</p> <p>2. Changed Q1-Q8 to BSZ068N06NS</p> <p>3. Changed current sense resistors to 0.1 Ohm 0.25W</p> <p>4. Changed aluminium elkos C13,C14 to 680uF 35V</p> <p>5. Changed capacitors C15-C18 to 4.7uF 50V</p>						B														
C	<p>UPS_10A_EVAL-V0.9pre2 -> UPS_10A_EVAL-V0.9pre3</p> <p>1. Renumbered TPs</p> <p>UPS_10A_EVAL-V0.9pre1 -> UPS_10A_EVAL-V0.9pre2</p> <p>1. Deleted unused MCLK signals from J1</p> <p>2. Renumbered capacitors</p> <p>UPS_10A_DEV-V0.9pre6 -> UPS_10A_EVAL-V0.9pre1</p> <p>1. Deleted Delta-Sigma current measurement parts</p> <p>2. Moved current measure amplifiers near to current sense resistors</p> <p>3. Moved pover supplies to sheet 4</p> <p>4. Deleted Phase_Current sheet (5)</p> <p>4. Renumbered components on sheets 3 & 4</p>						C														
D	<p>V0.9pre5 -> V0.9pre6</p> <p>1. Added 100n capacitors to AD7403 output side power</p> <p>V0.9pre5 -> V0.9pre6</p> <p>1. Removed LC from power output</p> <p>2. Removed voltage measurement from sheet 4</p> <p>3. Added solder bridge resistors to select U10/U11/12 power source</p> <p>4. Renumbered components</p> <p>V0.9pre4 -> V0.9pre5</p>				<p>Drafted by: Peep Narusberg</p> <p>Checked by: ---</p> <p>Approved by: Stephan Kubisch</p>		D														
1		2		3		4															
				<table><tr><td colspan="3">Title UPS 2A/24V A EVAL log and approval</td><td rowspan="4"> TRINAMIC <small>MOTION CONTROL</small></td><td rowspan="4">Waterloohain 5 22769 Hamburg Germany tmc_info@trinamic.com</td></tr><tr><td>Size: A4</td><td>Revision: V1.0</td><td>[No Variations]</td></tr><tr><td>Date: 14.04.2019</td><td>Time: 16: 40: 23</td><td>Sheet 5 of 5</td></tr><tr><td colspan="3">File: TMC-UPS-2A24V-A-EVAL V10 Log.SchDoc</td></tr></table>		Title UPS 2A/24V A EVAL log and approval			 TRINAMIC <small>MOTION CONTROL</small>	Waterloohain 5 22769 Hamburg Germany tmc_info@trinamic.com	Size: A4	Revision: V1.0	[No Variations]	Date: 14.04.2019	Time: 16: 40: 23	Sheet 5 of 5	File: TMC-UPS-2A24V-A-EVAL V10 Log.SchDoc				
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