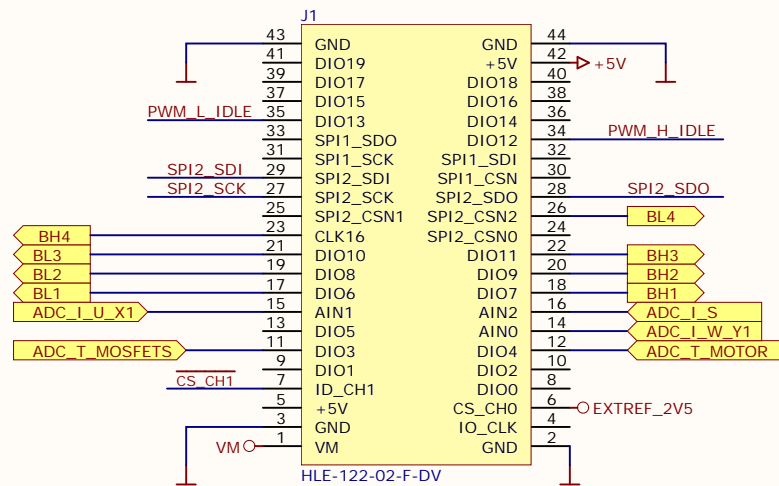
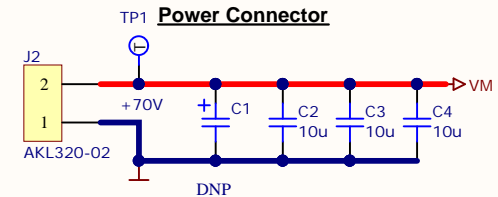
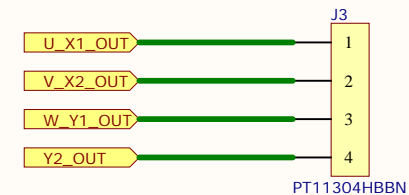
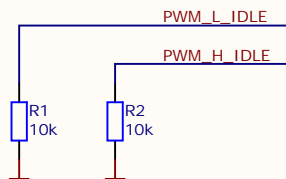
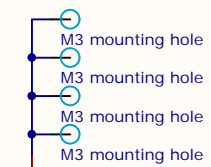
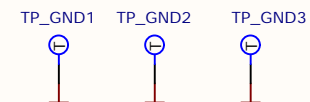
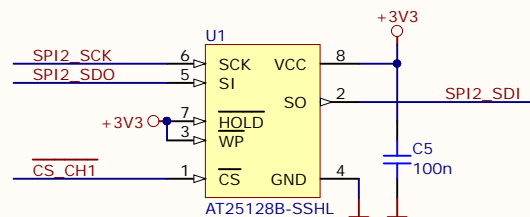


uC or Motor Controller Connector**Power Connector****Motor Connector****Bridge Idle State****Ident EEPROM**Title **Universal Power Stage 10A EVAL Main & I/O**Size: **A4**

Revision:

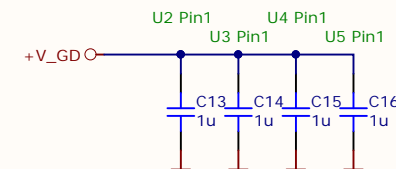
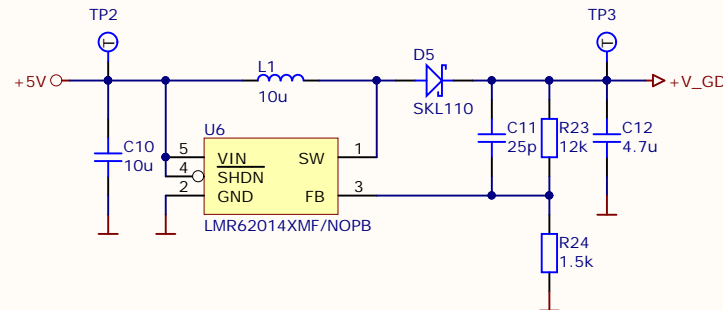
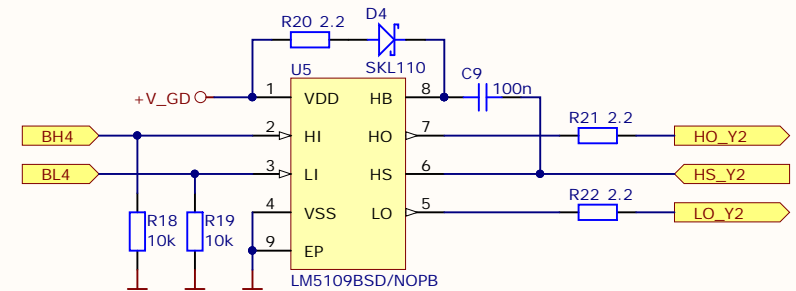
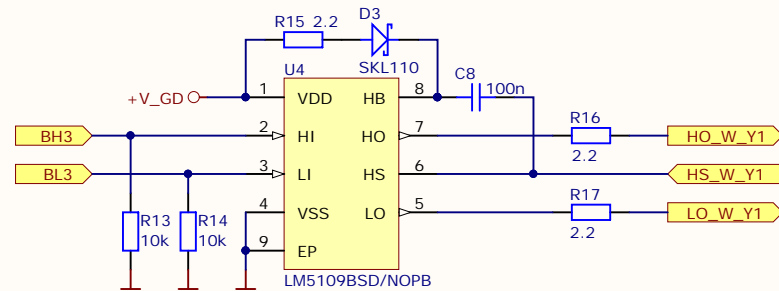
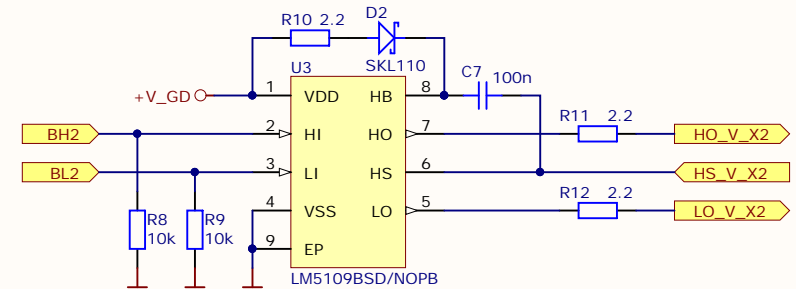
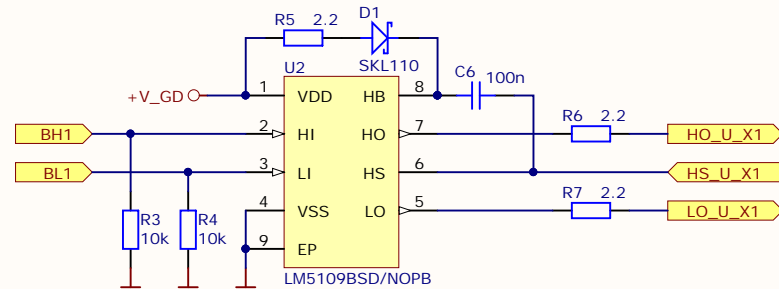
Initial

Date: 18.10.2017 Time: 18:35:41 Sheet 1 of 5

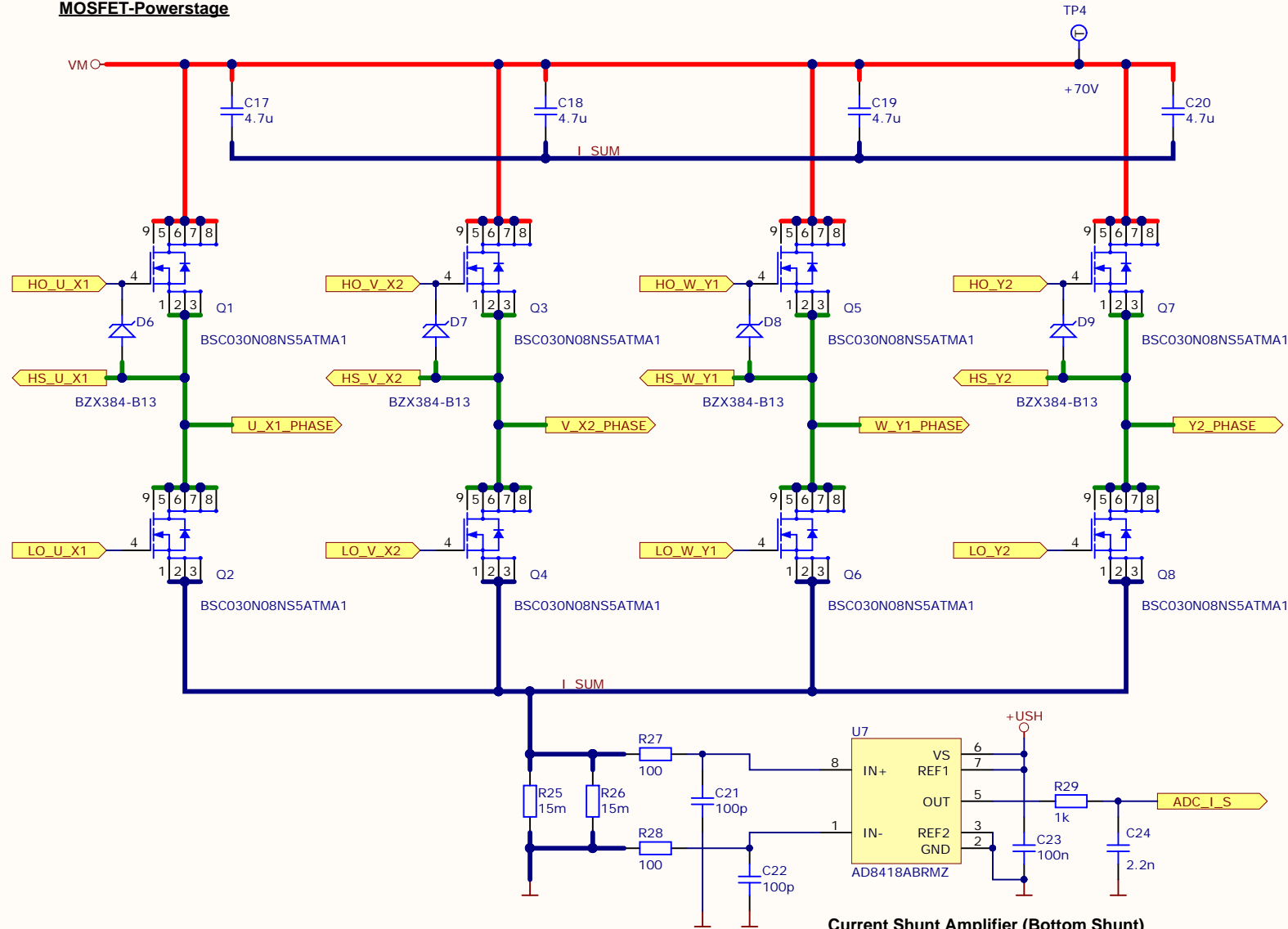
File: UPS 10A EVAL V11 Main.SchDoc

TRINAMIC
MOTION CONTROLWaterloohain 5
22769 Hamburg
Germany
tmc_info@trinamic.com

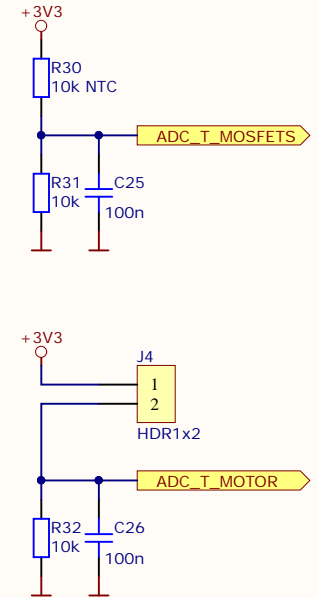
MOSFET Predrivers



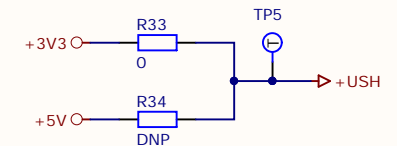
MOSFET-Powerstage




Temp sensing



Shunt Amplifier power select (default +3.3V)



Current Shunt Amplifier (Bottom Shunt)

Title Universal Power Stage 10A EVAL MOSFETs			 TRINAMIC MOTION CONTROL Waterloohain 5 22769 Hamburg Germany tmc_info@trinamic.com
Size: A4	Revision:	Initial	
Date: 18.10.2017	Time: 18:35:42	Sheet 3 of 5	
File: UPS 10A EVAL V11 MOSFETs.SchDoc			

Power Sense

U_X1_PHASE

V_X2_PHASE

W_Y1_PHASE

Y2_PHASE

Power limit for 1W current sense resistors

$$15\text{m}\Omega / 2 = 7.5\text{m}\Omega$$

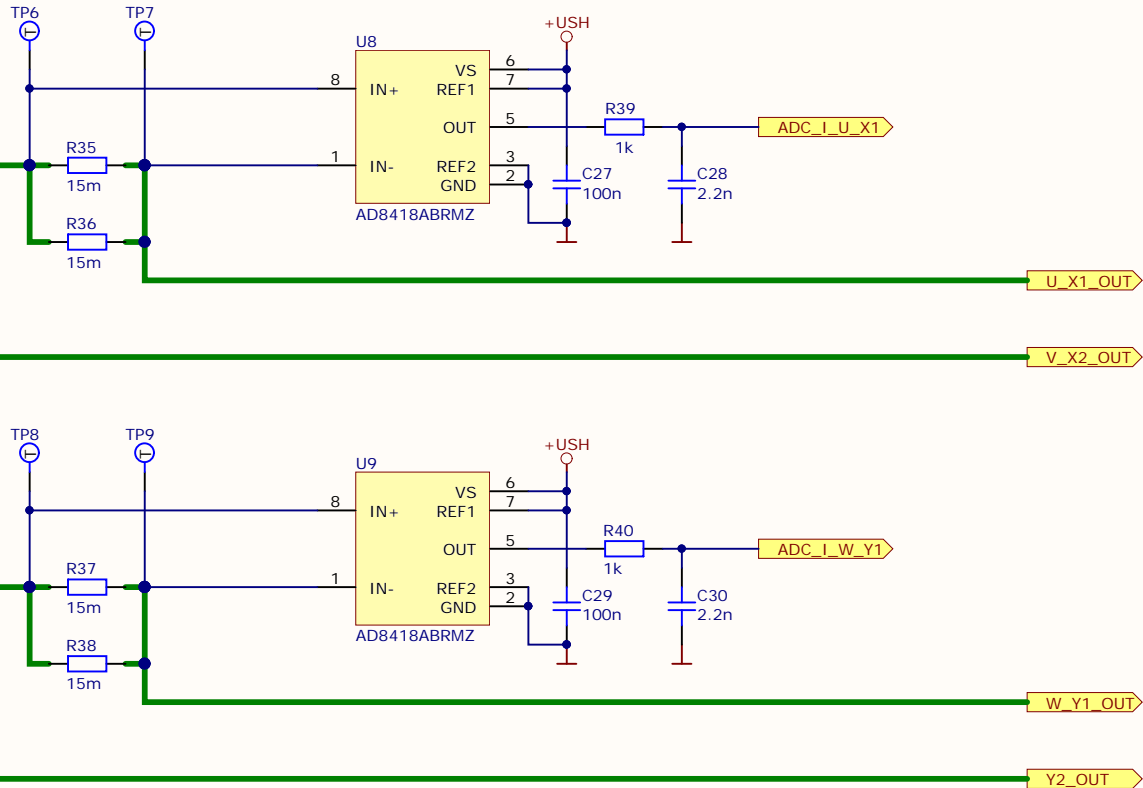
Voltage pass for current sense

$$10\text{A} * 7.5\text{m}\Omega = 75\text{mV}$$

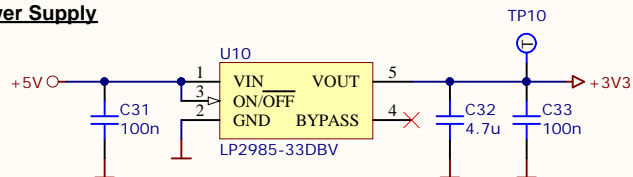
$$10\text{A} * 75\text{mV} = 0.75\text{W} < 2 \times 1\text{W}$$

AD8418 G=20

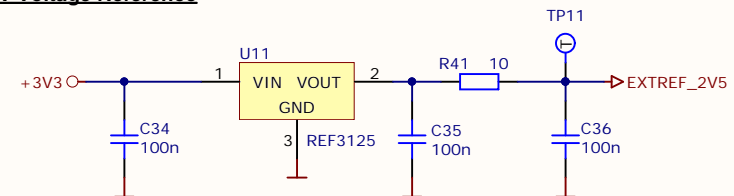
$$75\text{mV} * 20 = 1.5\text{V}$$



3.3V Power Supply



Ext 2.5V Voltage Reference



A

UPS_10A_EVAL-V0.92 - UPS_10A_EVAL-V0.92
1. Changed J2 to produced by Metz Connect AKL320-02
2. Added pull-down resistors to gate inputs on Predriver sheet, renumbered resistors
3. Corrected D1-D5 polarity

UPS_10A_EVAL-V0.91 -> UPS_10A_EVAL-V0.92
1. Moved input power capacitors to Main sheet
2. Renumbered C13 to C1 with DNP sign
3. Replaced C14 with three 10uF 100V capacitors
4. Renumbered all capacitors

UPS_10A_EVAL-V0.9(pre3) -> UPS_10A_EVAL-V0.91
1. Deleted unused on board SPI_ADC signals from J1

UPS_10A_EVAL-V0.9pre2 -> UPS_10A_EVAL-V0.9pre3
1. Renumbered TP's

UPS_10A_EVAL-V0.9pre1 -> UPS_10A_EVAL-V0.9pre2
1. Deleted unused MCLK signals from J1
2. Renumbered capacitors

UPS_10A_DEV-V0.9pre6 -> UPS_10A_EVAL-V0.9pre1
1. Deleted Delta-Sigma current measurement parts
2. Moved current measure amplifiers near to current sense resistors
3. Moved pover supplies to sheet 4
4. Deleted Phase_Current sheet (5)
4. Renumbered components on sheets 3 & 4

V0.9pre5 -> V0.9pre6
1. Added 100n capacitors to AD7403 output side power

V0.9pre5 -> V0.9pre6
1. Removed LC from power output
2. Removed voltage measurement from sheet 4
3. Added solder bridge resistors to select U10/U11/12 power source
4. Renumbered components

V0.9pre4 -> V0.9pre5

1. Renamed net between J1 pin 9 and U8 pin 7 to MCLK_W
2. Removed RC-s from power outputs
3. Removed jumpers from current shunt circuit
4. Disconnected J1 pin 5 from +5V
5. Deleted SPI ADC part of circuit
6. Corrected sheet 5 layout
7. Corrected phase voltage net names
8. Renumbered components

V0.9pre3 -> V0.9pre4

1. Added D5-D9 zeners
2. Corrected net name HQ_V_X2 for Q5
3. Corrected SPI SDO signals (swap)

V0.9pre2 -> V0.9pre3

1. Added +3.3V source U16
2. Added missing net names to JP3&4
3. Checked current sense resistors calculation, changed footprint to 2010[5025 Metric]

V0.9pre1 -> V0.9pre2

1. Corrected net and port names

ToDo:

A


B

C

D

D

Drafted by: Peep Narusberg
Checked by: ---
Approved by: Stephan Kubisch

Title Universal Power Stage 10A EVAL			 TRINAMIC MOTION CONTROL Waterloohain 5 22769 Hamburg Germany tmc_info@trinamic.com
Size: A4	Revision:	Initial	
Date: 18.10.2017	Time: 18: 35: 43	Sheet 5 of 5	
File: UPS 10A EVAL V11 Log.SchDoc			