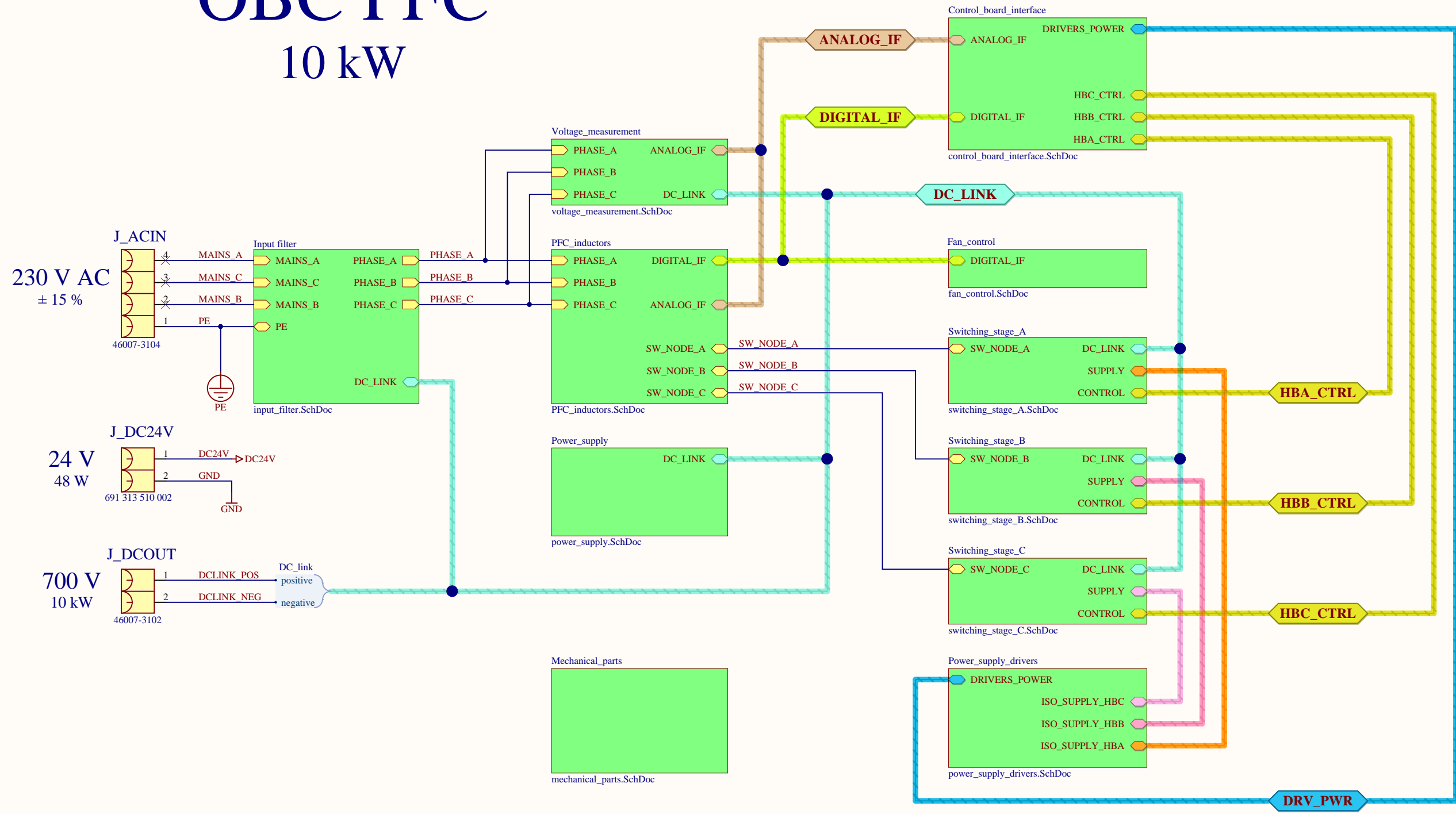


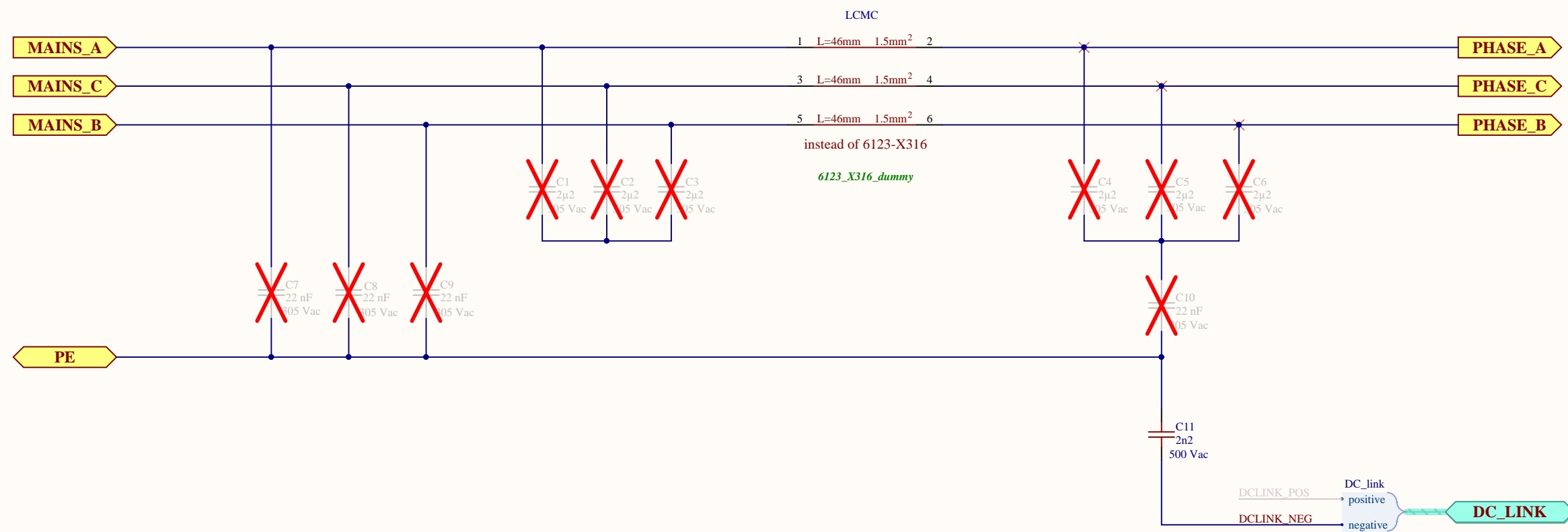
OBC PFC

10 kW



OBC PFC power board		Assembly variant:	State:
Top level		standard_board	released
Revision: 0.3	Repository revision: 890		ON Semiconductor Solution Engineering Center Piešťany
Engineer: Stefan Kosterec	16.Nov 2017 17:22		
File: OBC_PFC_power_board.SchDoc	1/12		





OBC PFC power board Mains input filter		Assembly variant: standard_board	State: released
Revision: 0.3	Repository revision: 890		ON Semiconductor Solution Engineering Center Piešťany
Engineer: Stefan Kosterec	26.Mar 2018 21:13		
File: input_filter.SchDoc	2/12		



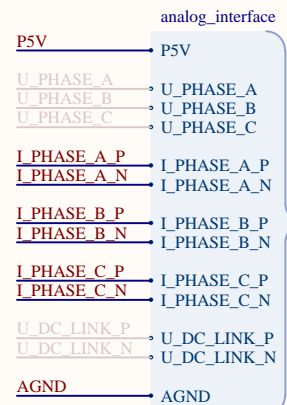
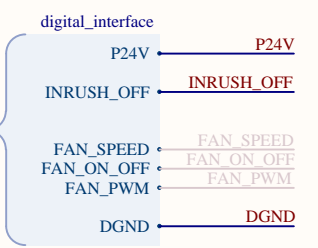
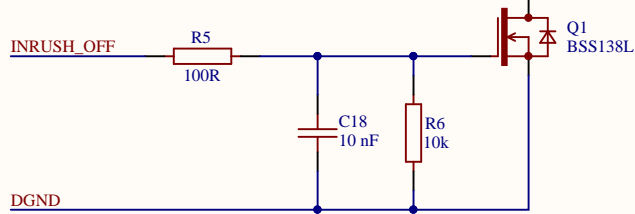
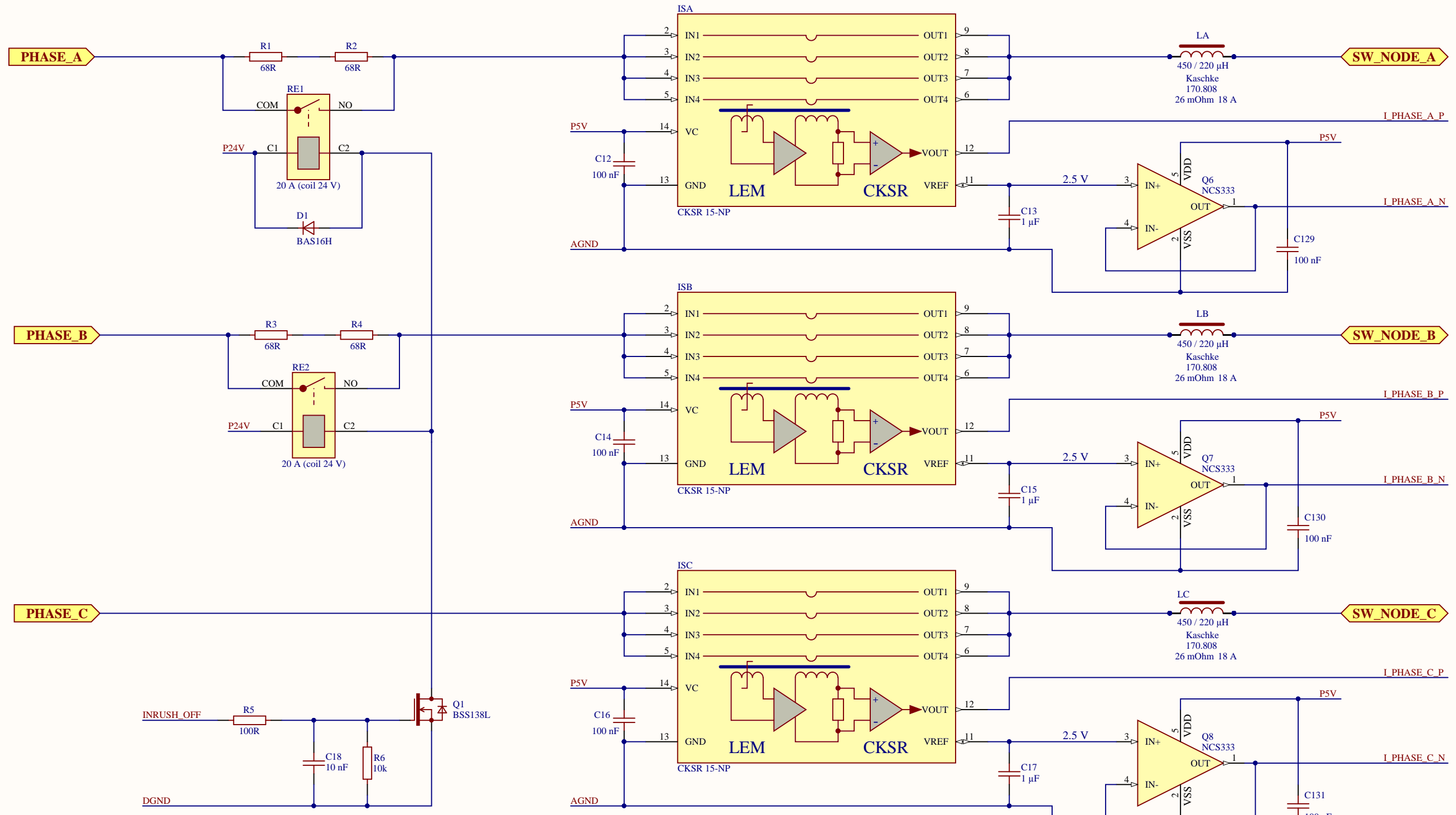
PHASE_A

PHASE_B

PHASE_C

DIGITAL_IF

ANALOG_IF



OBC PFC power board
PFC inductors, inrush current limitation, current measurement


Revision: 0.3 Repository revision: 890

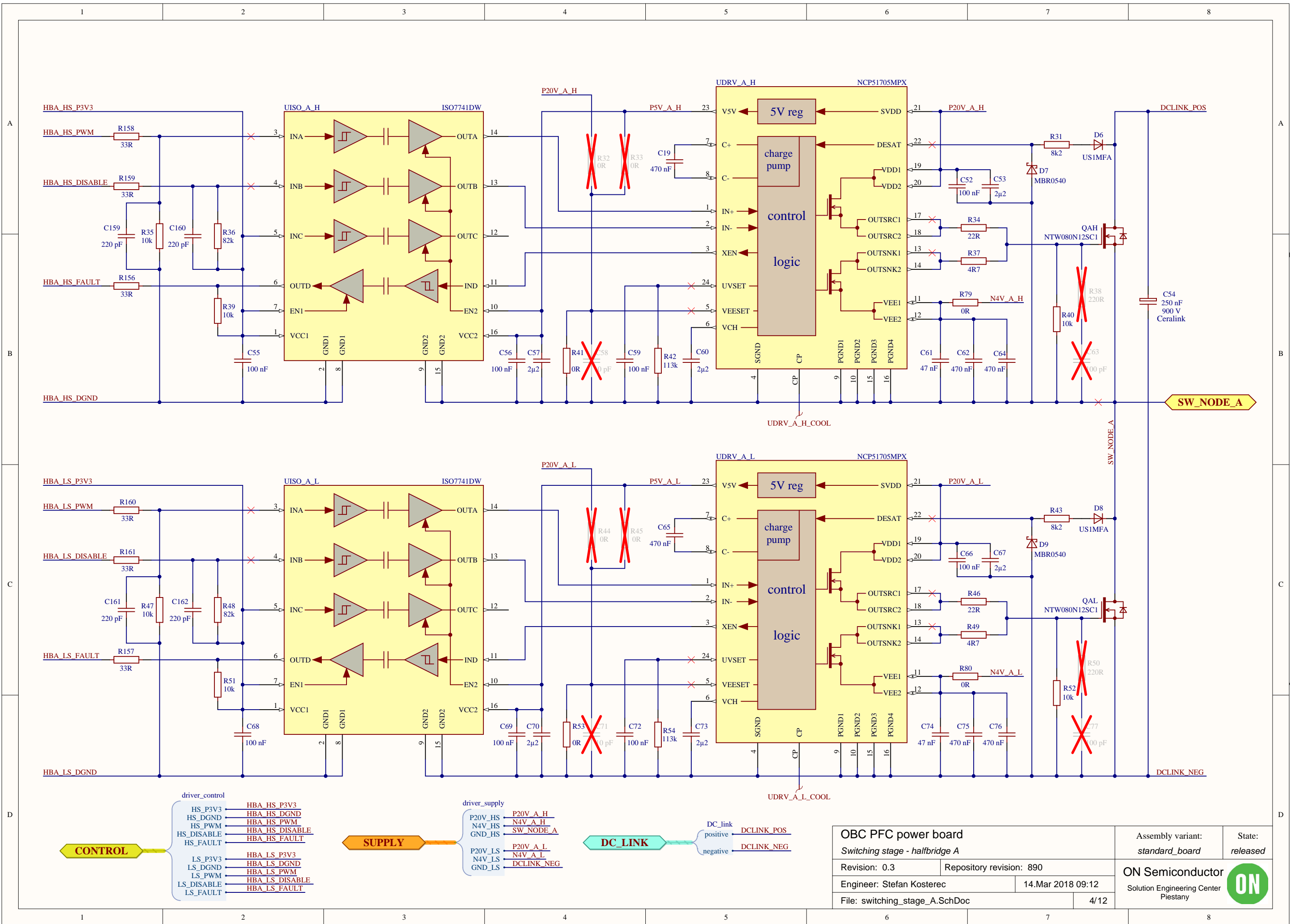
Engineer: Stefan Kosterec 17.Nov 2017 17:23

File: PFC_inductors.SchDoc 3/12

Assembly variant: *standard_board* State: *released*

ON Semiconductor
 Solution Engineering Center
 Piestany





OBC PFC power board

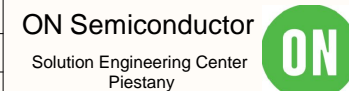
Switching stage - halfbridge A

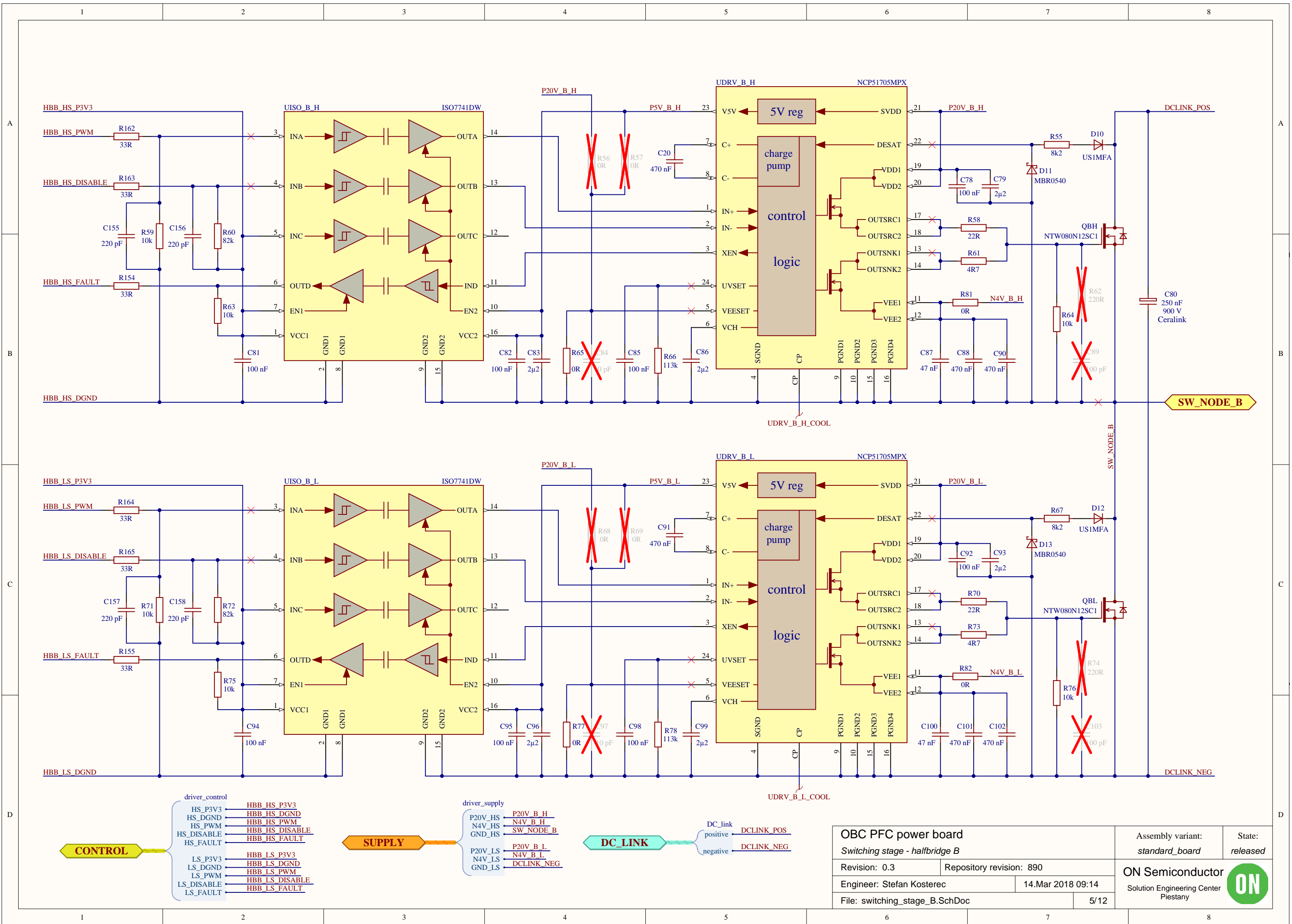
Revision: 0.3 Repository revision: 890

Engineer: Stefan Kosterec 14.Mar 2018 09:12

File: switching_stage_A.SchDoc 4/12

Assembly variant: *standard_board* State: *released*





OBC PFC power board

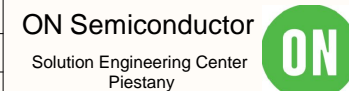
Switching stage - halfbridge B

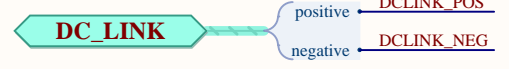
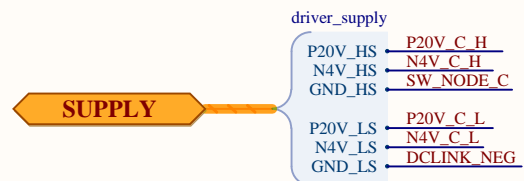
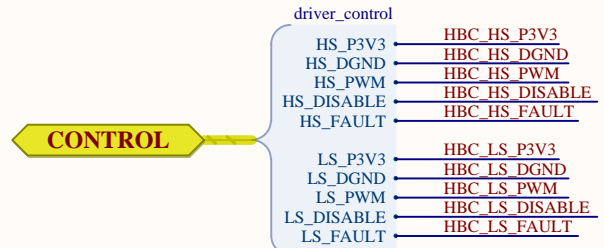
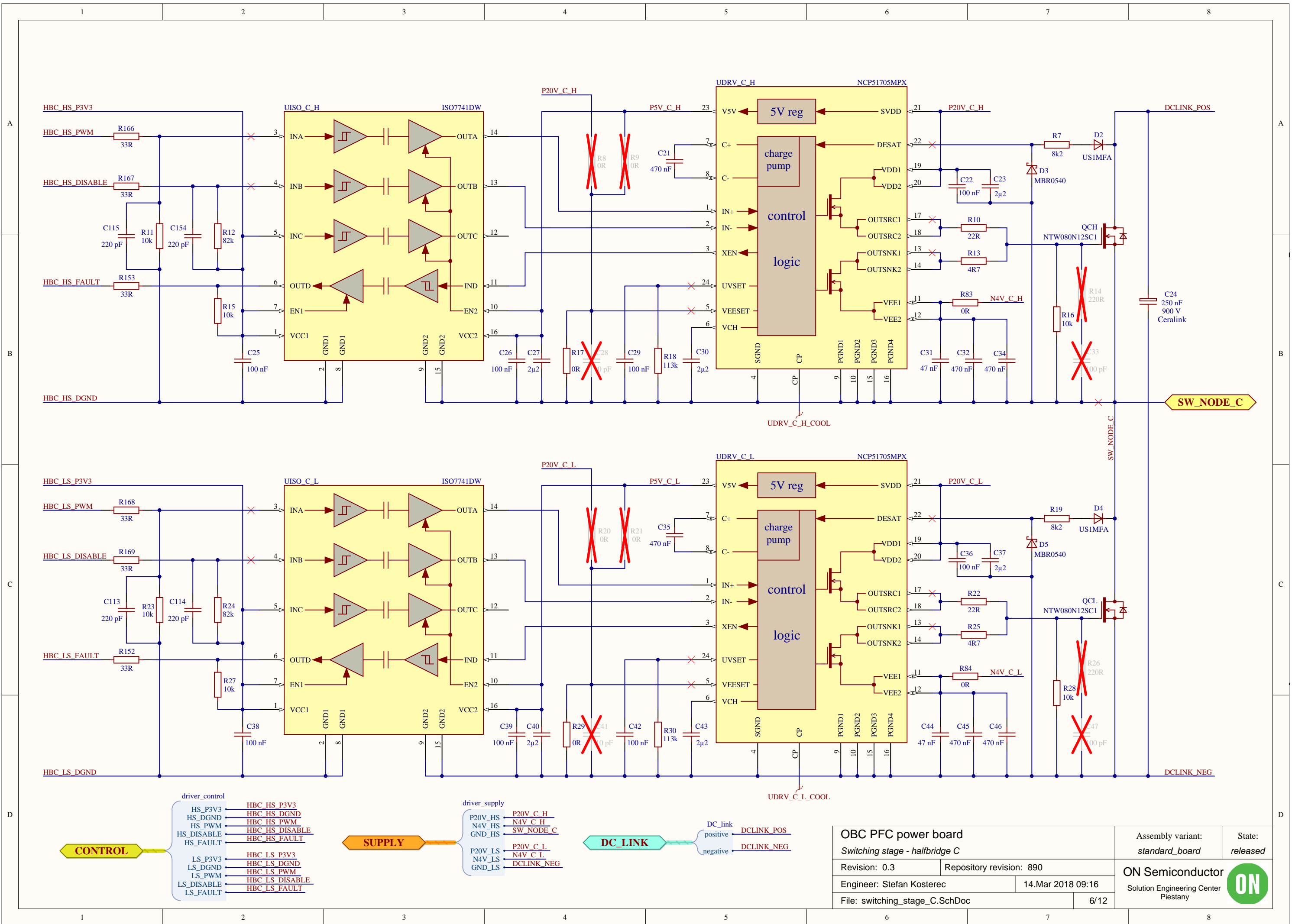
Revision: 0.3 Repository revision: 890

Engineer: Stefan Kosterec 14.Mar 2018 09:14

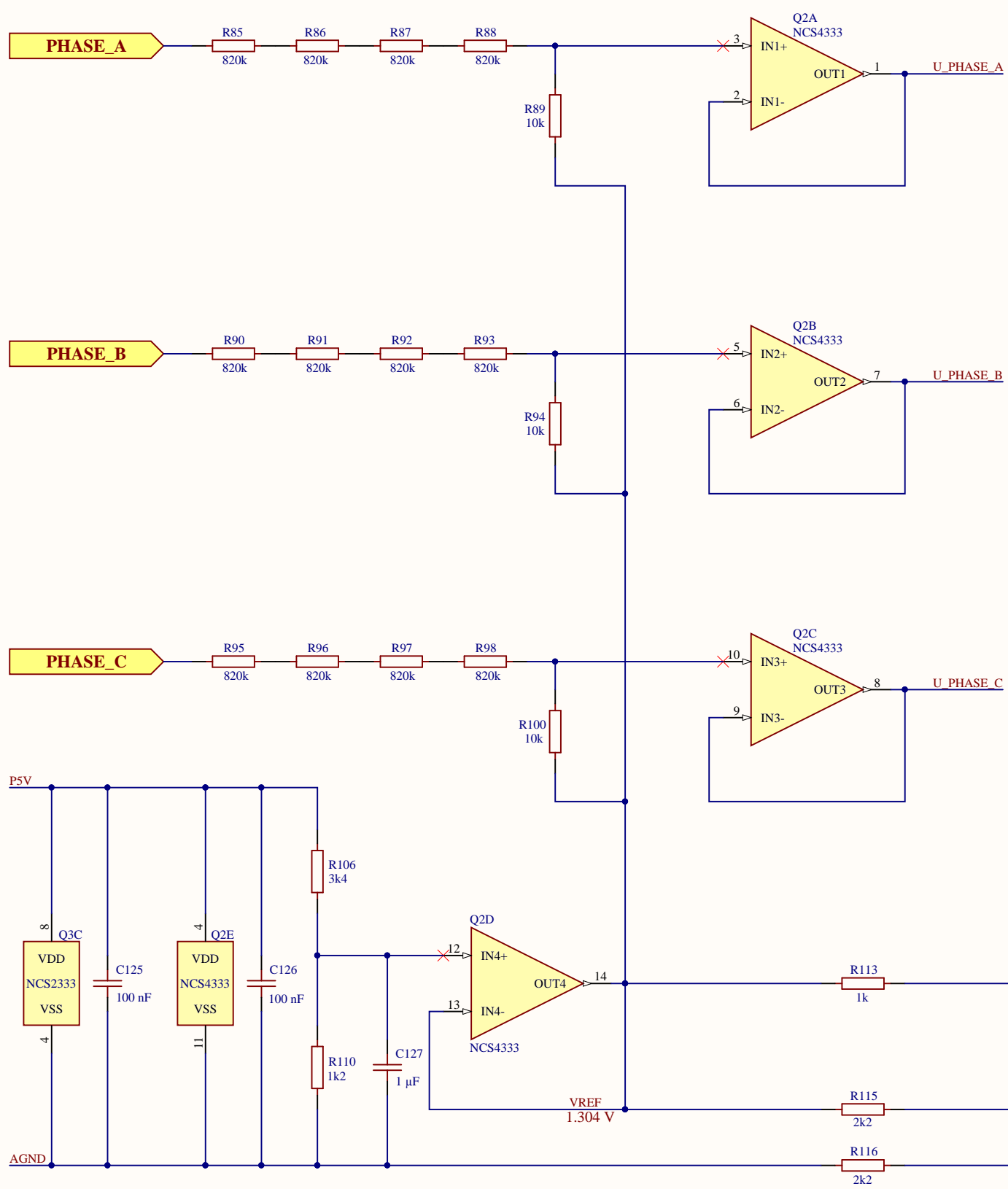
File: switching_stage_B.SchDoc 5/12

Assembly variant: *standard_board* State: *released*





OBC PFC power board		Assembly variant:	State:
Switching stage - halfbridge C		standard_board	released
Revision: 0.3	Repository revision: 890	ON Semiconductor Solution Engineering Center Piestany	
Engineer: Stefan Kosterec	14.Mar 2018 09:16		
File: switching_stage_C.SchDoc	6/12		

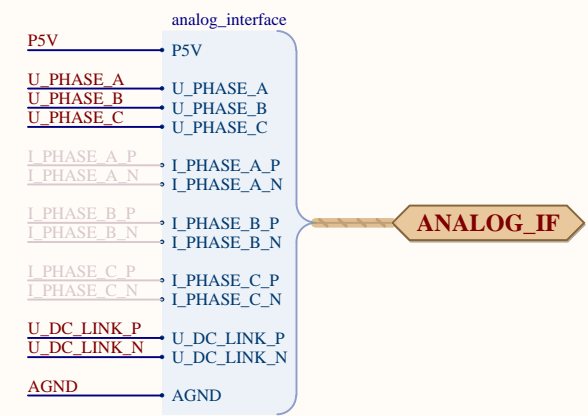
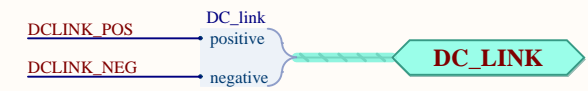
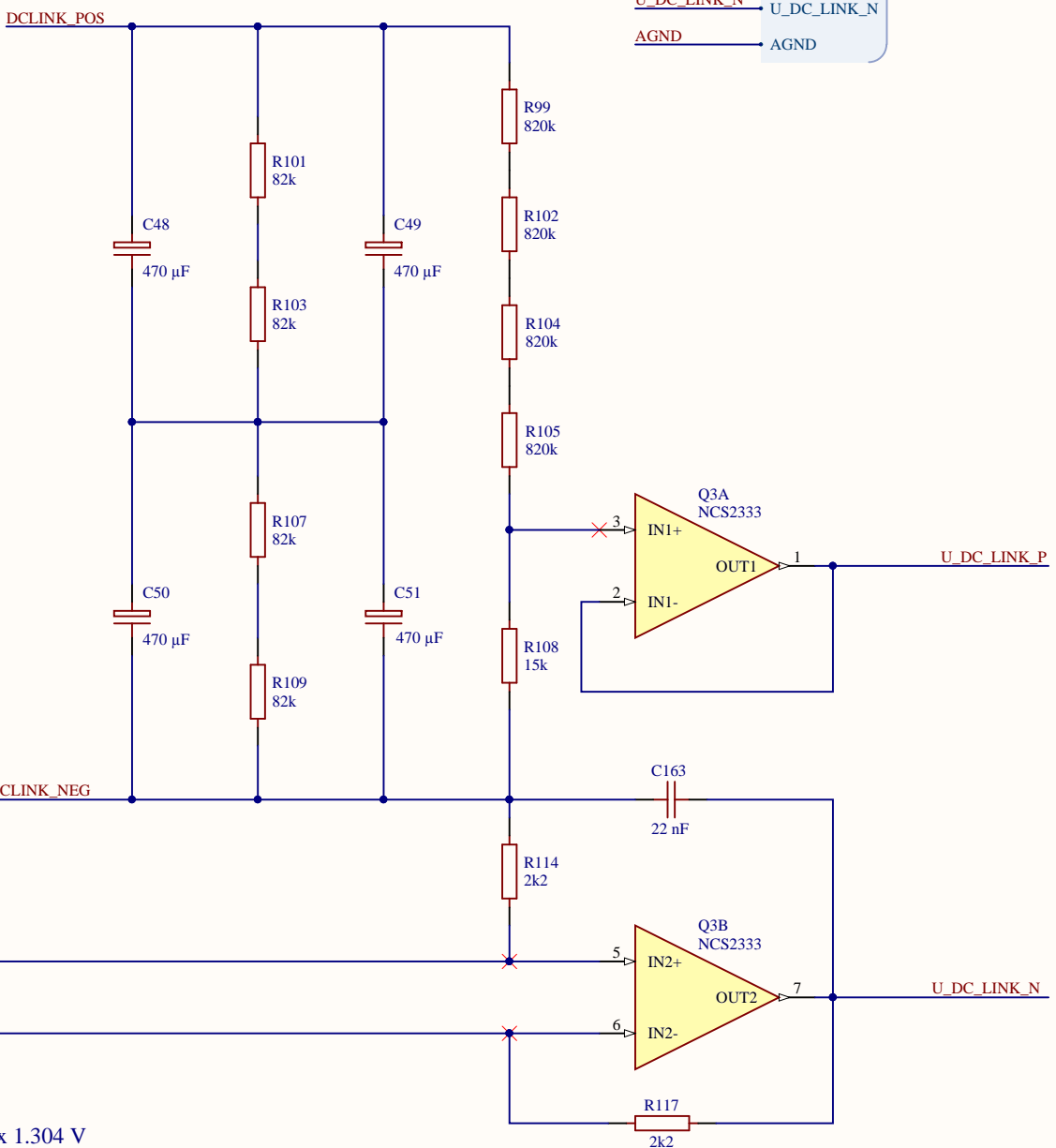


DC link voltage measurement:
only buffer stage is implemented on power board,
next signal processing occurs on control board.

Additionally, differential sensing approach is utilized
using virtual ground elevated (1.304 V nominal) to
minimize common ground impedance effects.

Scaling factor of this stage is 219.666.

Maximal DC link voltage which can be measured is
1098.3 V => 5.0 V



Phase - Phase voltage measurement:
Only buffer stages are implemented here, differential amplifiers are on control board.
In fact, phase to DC output negative line voltage is scaled down by factor 329
to 5V output. Using Vref of 1.304 V allows also negative voltages to be measured.

$U_{in} = 1217.3 \text{ V} \Rightarrow U_{PHASE} = 5.0 \text{ V}$
 $U_{in} = 0.0 \text{ V} \Rightarrow U_{PHASE} = 1.3 \text{ V}$
 $U_{in} = -427.7 \text{ V} \Rightarrow U_{PHASE} = 0.0 \text{ V}$

$$U_{in_A(B,C)} = 329 \times U_{phase_A(B,C)} - (329-1) \times 1.304 \text{ V}$$

$$U_{in_A(B,C)} = 329 \times U_{phase_A(B,C)} - 427.7 \text{ V}$$

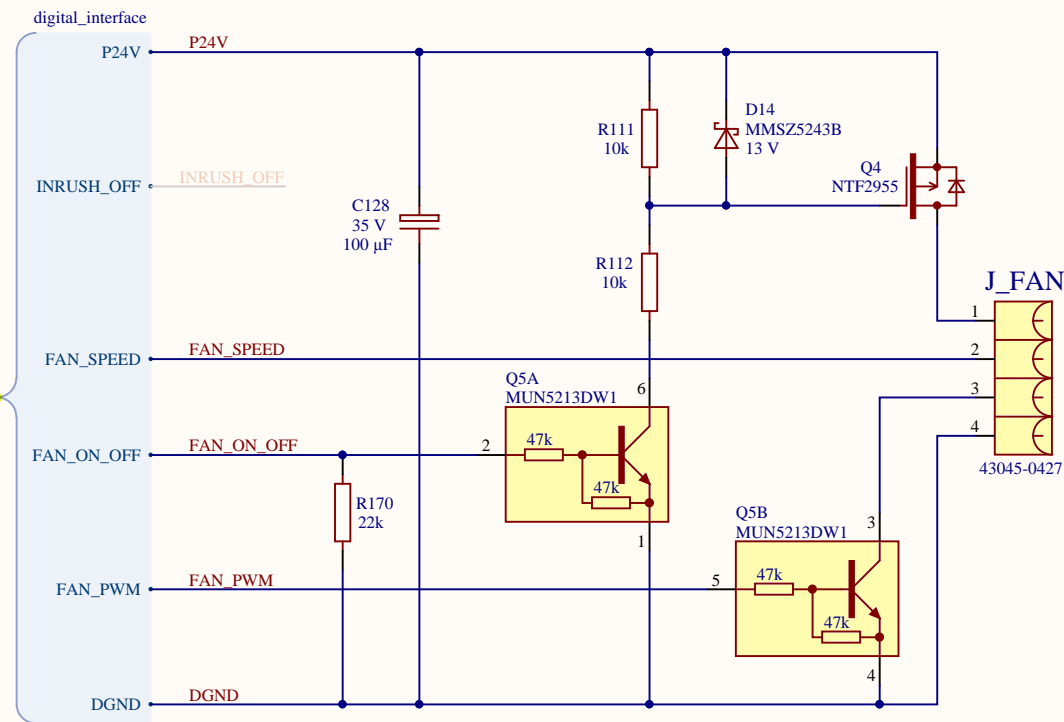
$$U_{phase_A(B,C)} = U_{in_A(B,C)} / 329 + (328/329) \times 1.304 \text{ V}$$

$$U_{phase_A(B,C)} = U_{in_A(B,C)} / 329 + 1.3 \text{ V}$$

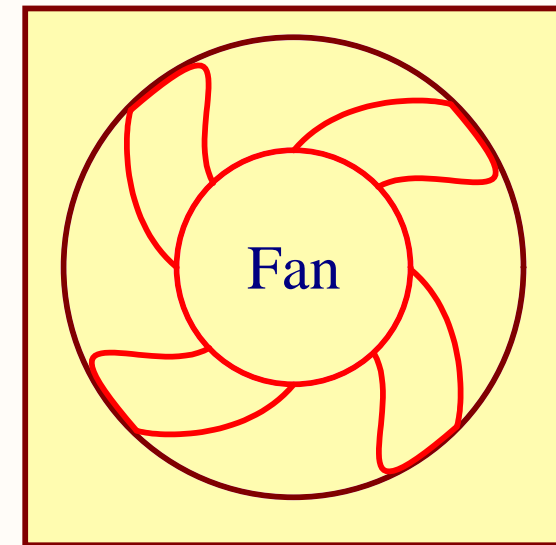
OBC PFC power board		Assembly variant:	State:
Phase and DC link voltage measurement		standard_board	released
Revision: 0.3	Repository revision: 890		ON Semiconductor Solution Engineering Center Piestany
Engineer: Stefan Kosterec	14.Mar 2018 09:23		
File: voltage_measurement.SchDoc	7/12		



DIGITAL_IF

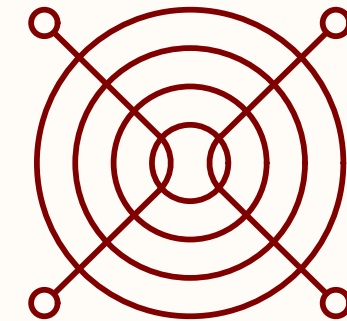


FAN



Fan 24V 60x60x38mm without ribs

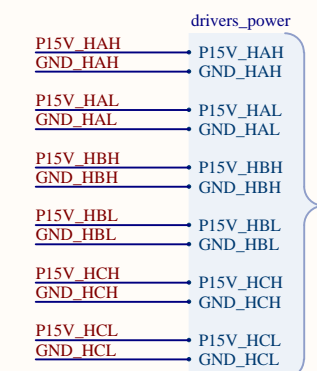
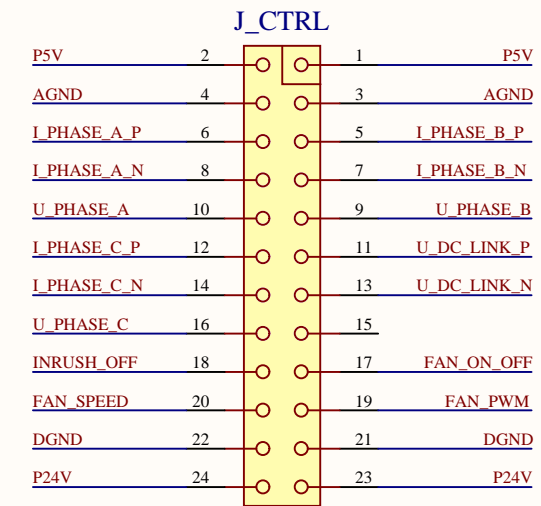
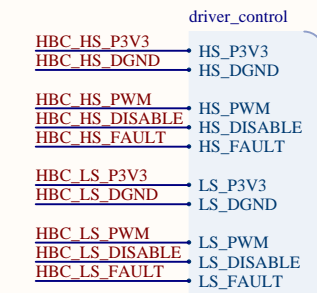
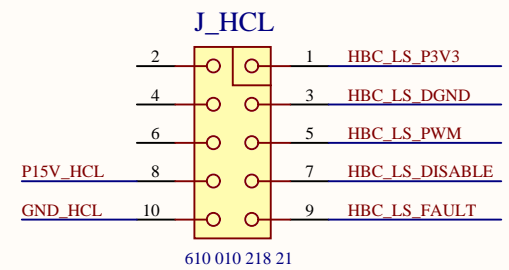
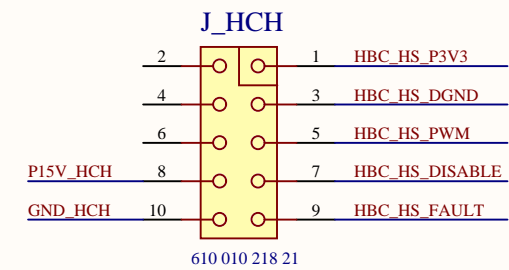
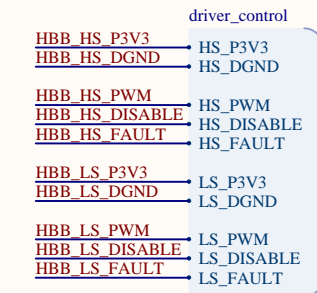
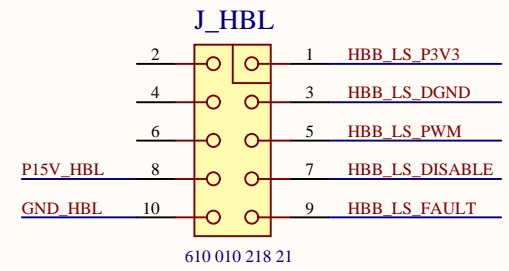
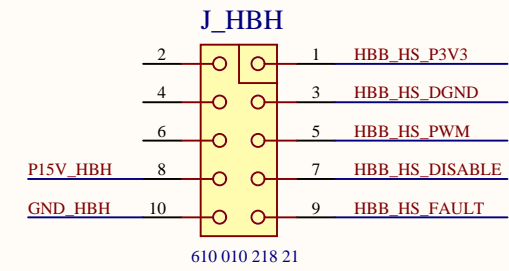
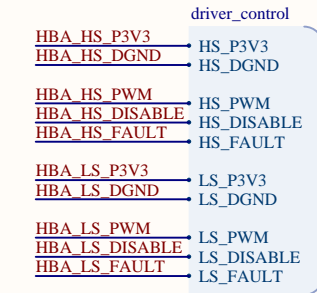
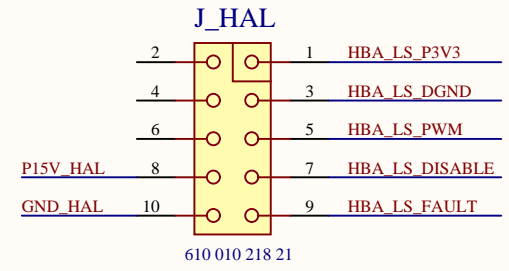
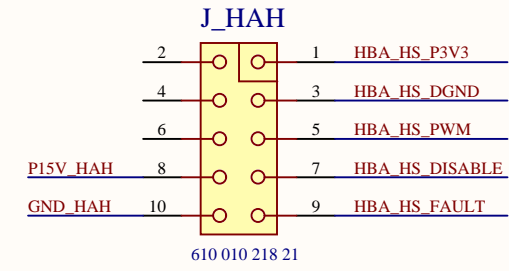
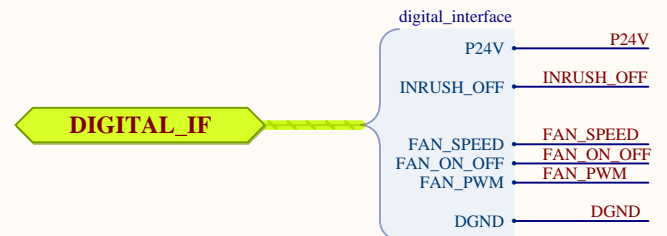
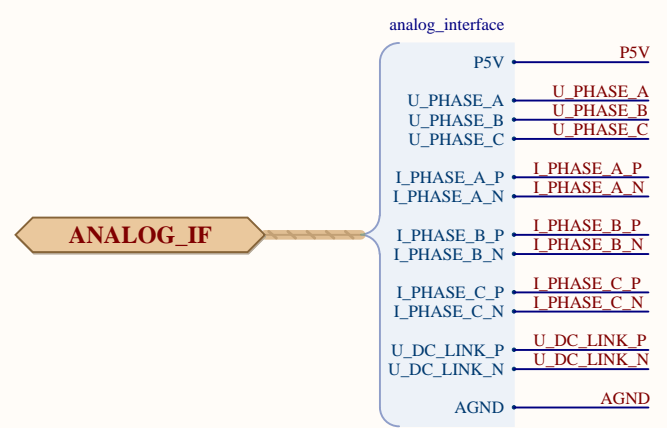
GR1



Fan finger guard for 60x60mm fans

OBC PFC power board		Assembly variant:	State:
Fan control		standard_board	released
Revision: 0.3	Repository revision: 890		ON Semiconductor Solution Engineering Center Piešťany
Engineer: Stefan Kosterec	16.Mar 2018 09:55		
File: fan_control.SchDoc	8/12		

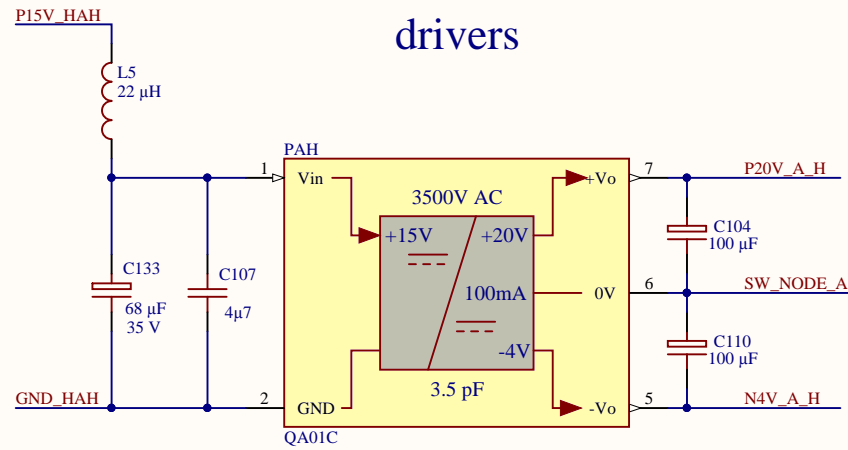




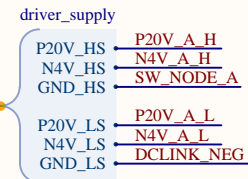
OBC PFC power board		Assembly variant:	State:
<i>Interface to control board</i>		<i>standard_board</i>	<i>released</i>
Revision: 0.3	Repository revision: 890	ON Semiconductor Solution Engineering Center Piešťany	
Engineer: Stefan Kosterec	20.Nov 2017 16:23		
File: control_board_interface.SchDoc	9/12		



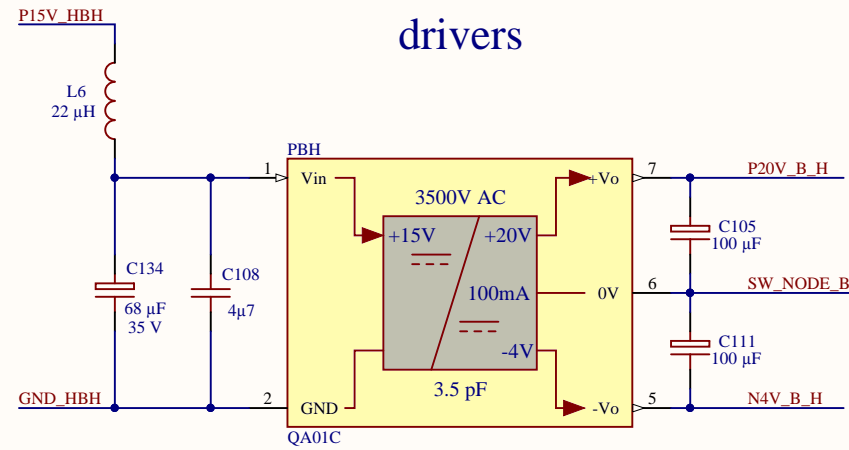
supply for
halfbridge A
drivers



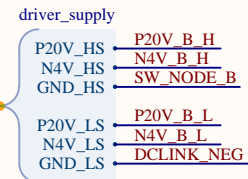
ISO_SUPPLY_HBA



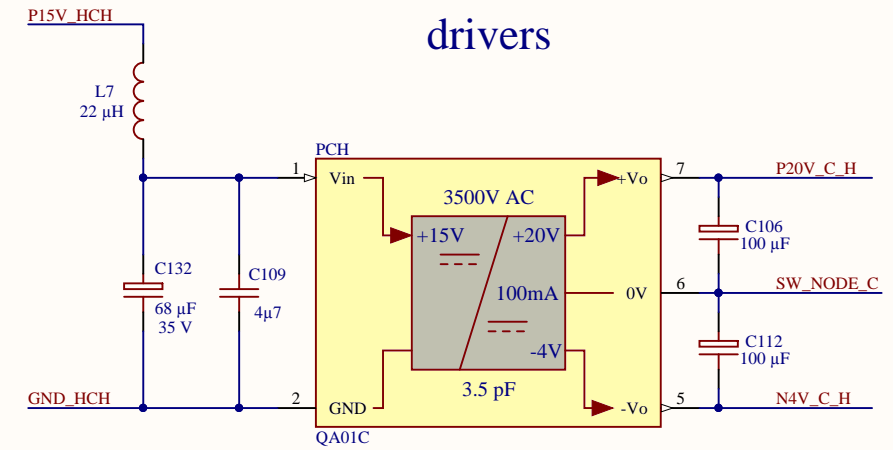
supply for
halfbridge B
drivers



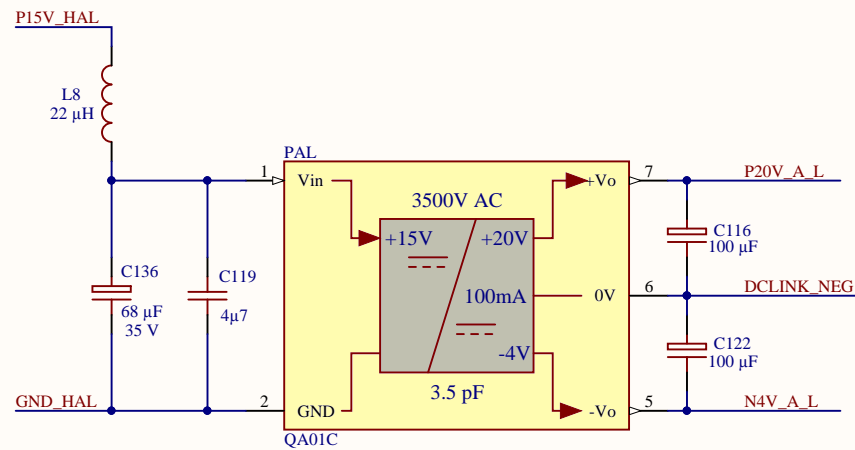
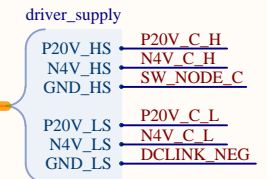
ISO_SUPPLY_HBB



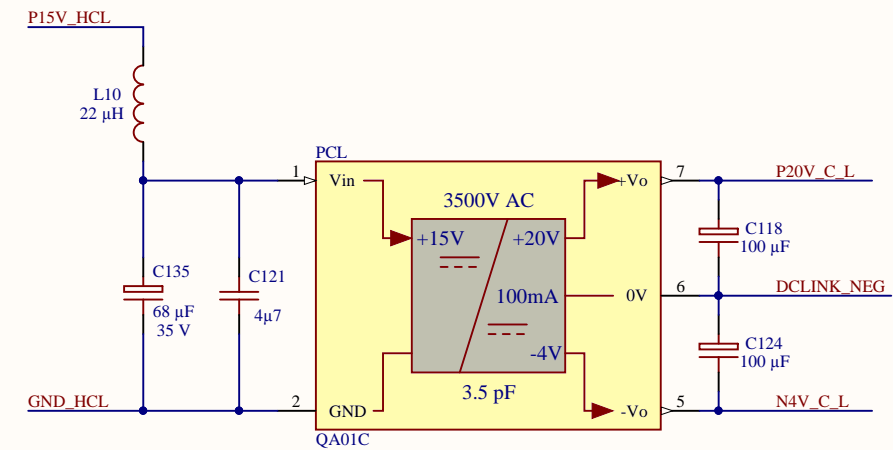
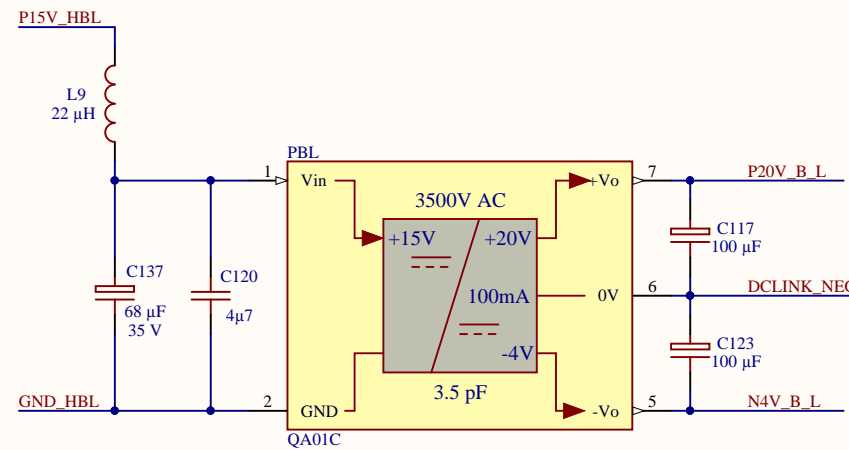
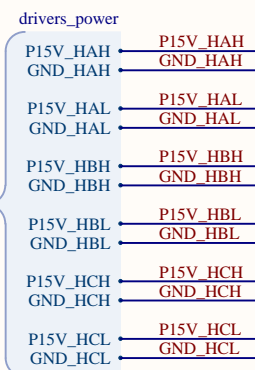
supply for
halfbridge C
drivers



ISO_SUPPLY_HBC

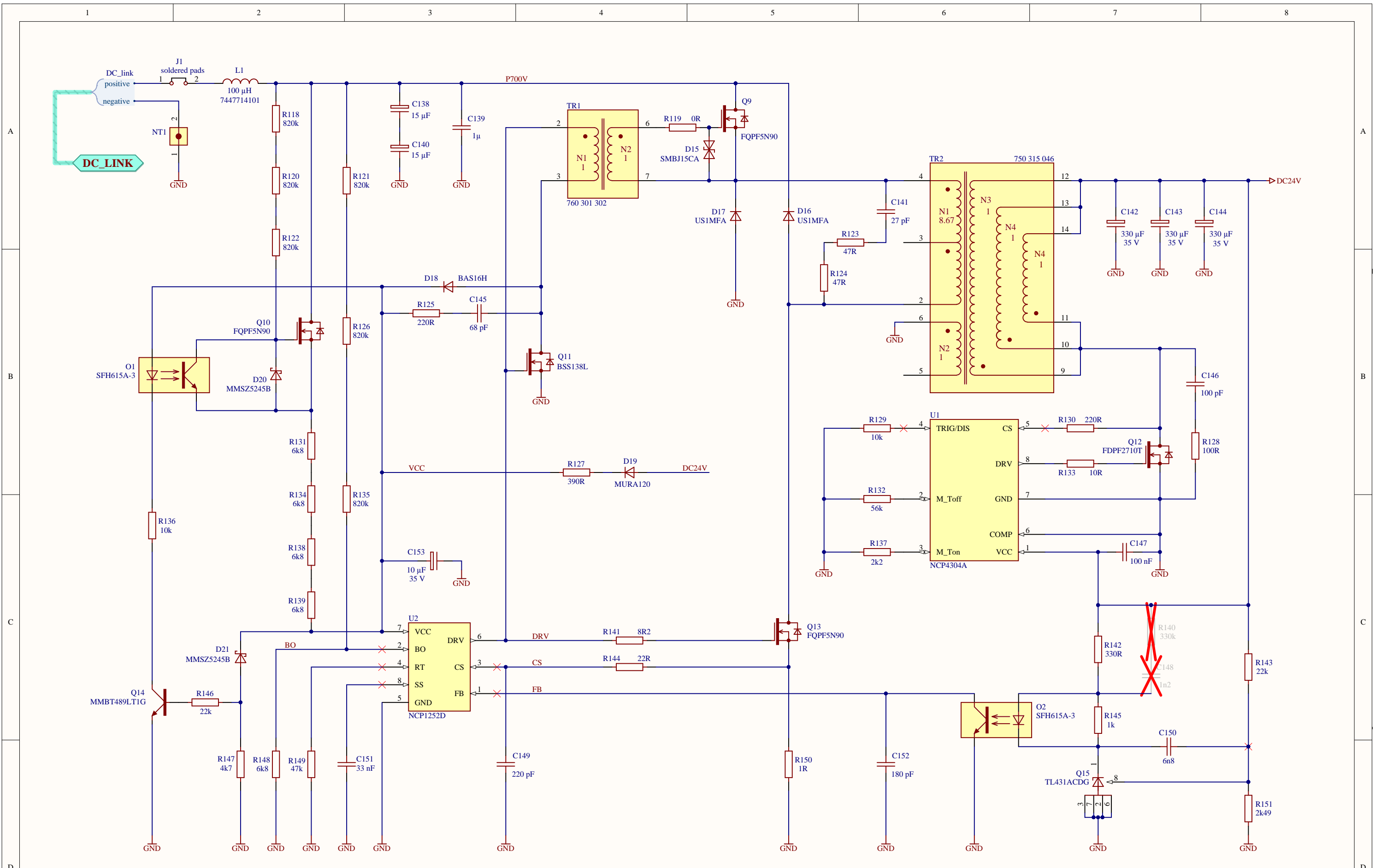


DRIVERS_POWER



OBC PFC power board		Assembly variant:	State:
Insulated DC-DC converters for MOSFET drivers		standard_board	released
Revision: 0.3	Repository revision: 890	ON Semiconductor Solution Engineering Center Piestany	
Engineer: Stefan Kosterec	20.Nov 2017 16:15		
File: power_supply_drivers.SchDoc	10/12		





OBC PFC power board		Assembly variant:	State:
DC-DC converter 700V - 24 V 50W		standard_board	released
Revision: 0.3	Repository revision: 890		ON Semiconductor Solution Engineering Center Piestany
Engineer: Michal Soldan, Stefan Kosterec	14.Mar 2018 10:54		
File: power_supply.SchDoc	11/12		



Heatsinks fixing set

HS_A
SK 489 100 mm black anodized modified for OBC PFC

HS_B
SK 489 100 mm black anodized modified for OBC PFC

HS_C
SK 489 100 mm black anodized modified for OBC PFC

Q3 & Q9 heatsink

HS_FB
modified MC33278

AC input connector set

J_ACIN_a 44441-2004

CP_ACIN_1a 171825-0100 → AWG12-10

CP_ACIN_2a 171825-0100

CP_ACIN_3a 171825-0100

CP_ACIN_4a 171825-0100 → AWG12-10

CP_ACIN_1b 43375-0001 → AWG14-16

CP_ACIN_2b 43375-0001

CP_ACIN_3b 43375-0001

CP_ACIN_4b 43375-0001 → AWG14-16

Power MOSFETs fixing set

WHAH, WHBL, WHBH, WHCL, WHCH, WHAL, WHBL, WHBH, WHCL, WHCH

WPQAL, WPQAH, WPQBL, WPQBH, WPQCL, WPQCH

WSQAL, WSQAH, WSQBL, WSQBH, WSQCL, WSQCH

SQAL, SQAH, SQBL, SQBH, SQCL, SQCH

plain washer M3 DIN125A, spring washer M3 DIN7980, M3x16 DIN7985

DC output connector set

J_DCOUT_a 44441-2002

CP_DCOUT_1a 43375-0001 → AWG14-16

CP_DCOUT_2a 43375-0001

CP_DCOUT_1b 171825-0100 → AWG12-10

CP_DCOUT_2b 171825-0100

Board fixing set

SPB1-SPB8: Spacer M4 M/F 8/40 HEX7

SPM1-SPM8: Spacer M4 M/F 8/25 HEX7

SPT1-SPT8: Spacer M4 F/F 70 HEX7

PFC inductors fixing

NA, NB, NC: hex nut M5 DIN934

Fan fixing set

BR_LEFT, BR_RIGHT: custom left/right bracket

SFAN1-SFAN4: M3x8/M4x10 DIN7985 screws

N_SR: hex nut M3 DIN934

Q12 heatsink

S_SR: M10x8 DIN7985 screw

W_SR1: plain washer M3 DIN125A

HS_SR: 577202 heatsink for TO220

W_SR2, W_SR3: plain washer M3 DIN125A

spring washer M3 DIN7980

N_SR: hex nut M3 DIN934

Fan connector set

J_FAN_a 43025-0400

CP_FAN1-CP_FAN4: 46235-0001 → AWG30-26

DC24V output connector

J_DC24V_a 2P 691 351 500 002

S1_top ON symbol

S1_bottom ON symbol

OBC PFC power board <i>Mechanical and enclosed parts</i>		Assembly variant: <i>standard_board</i>	State: <i>released</i>
Revision: 0.3	Repository revision: 890		ON Semiconductor Solution Engineering Center Piestany
Engineer: Stefan Kosterec	27.Mar 2018 21:54		
File: mechanical_parts.SchDoc	12/12		