SCREW1
2 -56 UNC

SCREW2
2 -56 UNC

J1
DAC_OUT_P1 1 35 DAC_OUT_N1
DAC_OUT_P2 2 36 DAC_OUT_N2
DAC_OUT_P3 3 37 DAC_OUT_N3
DAC_OUT_P4 4 38 DAC_OUT_N4
DAC_OUT_P5 5 39 DAC_OUT_N5
DAC_OUT_P6 6 40 DAC_OUT_N6
DAC_OUT_P7 7 41 DAC_OUT_N7
DAC_OUT_P8 8 42 DAC_OUT_N8
DAC_OUT_P9 9 43 DAC_OUT_N9
DAC_OUT_P10 10 44 DAC_OUT_N10
DAC_OUT_P11 11 45 DAC_OUT_N11
DAC_OUT_P12 12 46 DAC_OUT_N12
DAC_OUT_P13 13 47 DAC_OUT_N13
DAC_OUT_P14 14 48 DAC_OUT_N14
DAC_OUT_P15 15 49 DAC_OUT_N15
DAC_OUT_P16 16 50 DAC_OUT_N16
GND 17 51 GND
P13V0_SCSI 18 52 N13V0_SCSI
DAC_OUT_P17 19 53 DAC_OUT_N17
DAC_OUT_P18 20 54 DAC_OUT_N18
DAC_OUT_P19 21 55 DAC_OUT_N19
DAC_OUT_P20 22 56 DAC_OUT_N20
DAC_OUT_P21 23 57 DAC_OUT_N21
DAC_OUT_P22 24 58 DAC_OUT_N22
DAC_OUT_P23 25 59 DAC_OUT_N23
DAC_OUT_P24 26 60 DAC_OUT_N24
DAC_OUT_P25 27 61 DAC_OUT_N25
DAC_OUT_P26 28 62 DAC_OUT_N26
DAC_OUT_P27 29 63 DAC_OUT_N27
DAC_OUT_P28 30 64 DAC_OUT_N28
DAC_OUT_P29 31 65 DAC_OUT_N29
DAC_OUT_P30 32 66 DAC_OUT_N30
DAC_OUT_P31 33 67 DAC_OUT_N31
DAC_OUT_P32 34 68 DAC_OUT_N32
69 70
GND

B9 B5 B1
B2 B6 B10
TEC heat sink mounting holes
H51
TEC heat sink

220 R39 220 R40 220 R41 220 R42
TEC positioning components
N12V0A N12V0A

R11 10k
J2
Undefined R15
GND GND
Peltier contacts
TEC1
TEC+
TEC-
2W max
CP20147H
P12V0
GND
GND
P3V3_MP
Undefined R26
Undefined R27
Max 0.3A@12V
Temperature regulator

U_Supply_DAC
Supply_DAC.SchDoc

make sure that the thermistor is grounded on the temperature controller

U_LVDS_IFC_DAC
LVDS_IFC_DAC.SchDoc
CSN
LDACn
SDI
CLRn
SCKI
BUSY
SDO
I2C_SDA
I2C_SCL
CSN_EXT

U_DAC_32CH
DAC_32CH.SchDoc
CSn
LDACn
SDI
CLRn
SCKI
BUSY
SDO
RESETn
VOUT[32..1]

VOUT[32..1]
VOUT
Repeat(U_Output_channel,1,32)
Output_channel.SchDoc
Repeat(IN)
Repeat(OUT_P)
Repeat(OUT_N)
DAC_OUT_P[32..1]
DAC_OUT_N[31..1]

CSN_EXT
TP18

IC19
STM811SW16F
VCC RST
MR VSS

IC23
SN74LV595APWT
OE RCLK SRCLR SRCLK SER
QA QB QC QD QE QF QG QH QH'
VCC GND
SCKI SDI CSN_EXT P3V3
82pF C95 82pF C68 C71 82pF
C96 1nF
LED0 LED1 LED2 LED3 LED4 LED5 LED6 LED7

R13 R14 R15 R19 R20 R21 R22 R23 220
LD4A BOT LD4B MBOT LD4C MTOP LD4D TOP
LD5A BOT LD5B MBOT LD5C MTOP LD5D TOP
Green

8 user LEDs

Maximum current for +/- 13V supply over SCSI connector is +/- 100mA

J3
DAC_OUT_P1 DAC_OUT_N1 DAC_OUT_P2 DAC_OUT_N2 DAC_OUT_P3 DAC_OUT_N3 DAC_OUT_P4 DAC_OUT_N4 DAC_OUT_P5 DAC_OUT_N5 DAC_OUT_P6 DAC_OUT_N6 DAC_OUT_P7 DAC_OUT_N7 DAC_OUT_P8 DAC_OUT_N8 P13V0_SCSI N13V0_SCSI

J4
DAC_OUT_P9 DAC_OUT_N9 DAC_OUT_P10 DAC_OUT_N10 DAC_OUT_P11 DAC_OUT_N11 DAC_OUT_P12 DAC_OUT_N12 DAC_OUT_P13 DAC_OUT_N13 DAC_OUT_P14 DAC_OUT_N14 DAC_OUT_P15 DAC_OUT_N15 DAC_OUT_P16 DAC_OUT_N16 P13V0_SCSI N13V0_SCSI

J5
DAC_OUT_P17 DAC_OUT_N17 DAC_OUT_P18 DAC_OUT_N18 DAC_OUT_P19 DAC_OUT_N19 DAC_OUT_P20 DAC_OUT_N20 DAC_OUT_P21 DAC_OUT_N21 DAC_OUT_P22 DAC_OUT_N22 DAC_OUT_P23 DAC_OUT_N23 DAC_OUT_P24 DAC_OUT_N24 P13V0_SCSI N13V0_SCSI

J7
DAC_OUT_P25 DAC_OUT_N25 DAC_OUT_P26 DAC_OUT_N26 DAC_OUT_P27 DAC_OUT_N27 DAC_OUT_P28 DAC_OUT_N28 DAC_OUT_P29 DAC_OUT_N29 DAC_OUT_P30 DAC_OUT_N30 DAC_OUT_P31 DAC_OUT_N31 DAC_OUT_P32 DAC_OUT_N32 P13V0_SCSI N13V0_SCSI

FIG1
FIG2
FIG3
FIG4

Front panel grounding

B1 R28 0 C11 Undefined GND GND
B7 R29 0 C15 Undefined GND GND

shield clips

CLIP28 CLIP29 CLIP30 CLIP31 CLIP32
CLIP33 CLIP34 CLIP35 CLIP36 CLIP37
CLIP38 CLIP39 CLIP40 CLIP41 CLIP42
CLIP43 CLIP44 CLIP45 CLIP46 CLIP47
CLIP48 CLIP49 CLIP50 CLIP51 CLIP52 CLIP27
GND

Project/Equipment Zotino

Document

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Zotino v1.2
32 channel 16 Bit DAC - TOP

Designer	G.K.
Drawn by	G.K. XX/XX/XXXX
Check.by	-
Last Mod.	- 14.08.2018
File	Zotino.schdoc
Print Date	15.08.2018 14:03:39 Sheet 1 of 7

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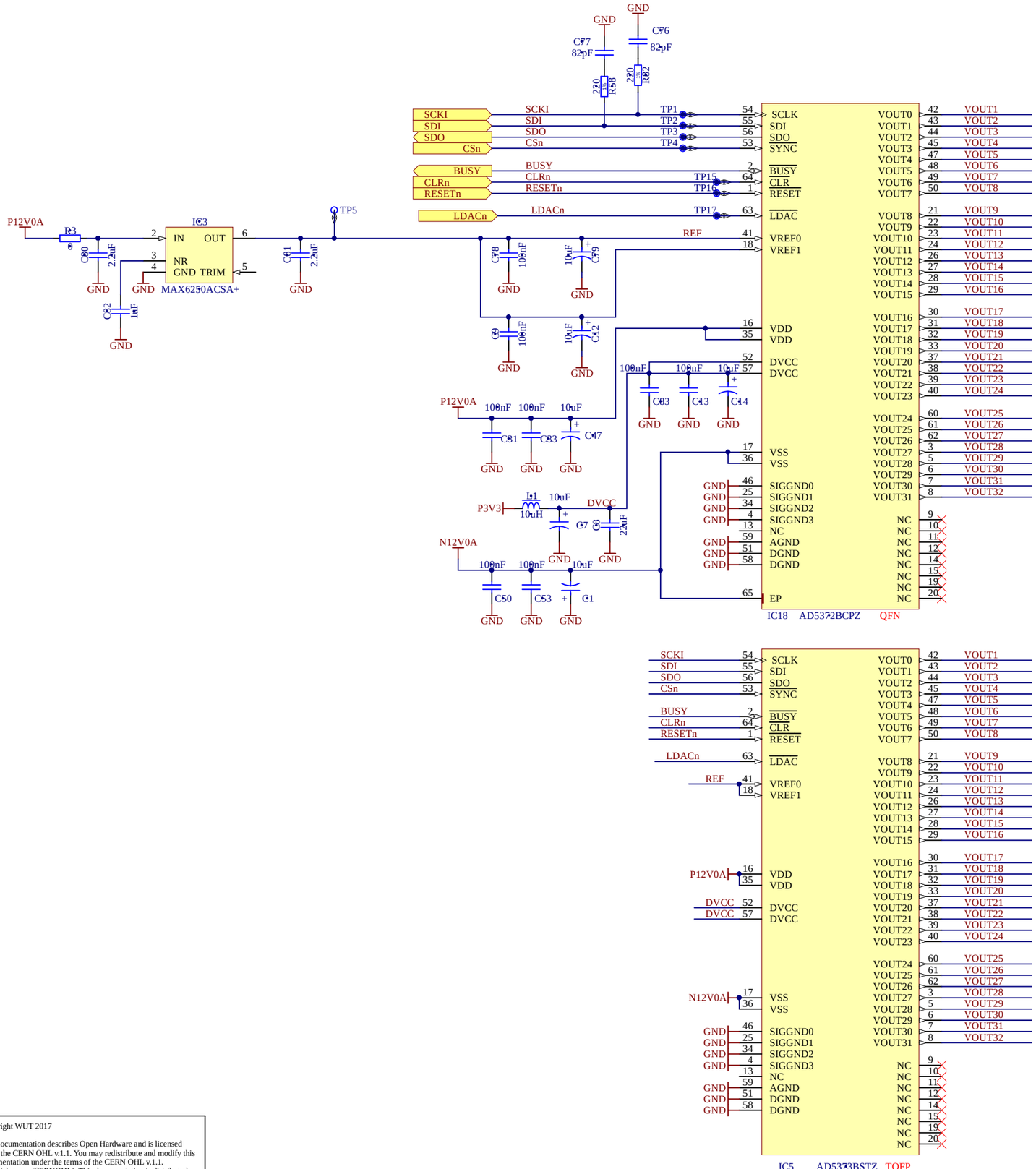
ARTIQ

Size A3 Rev -



Project/Equipment	Zotino
Document	DAC & reference v1.2
Designer	G.K.
Drawn by	G.K.
Check.by	
Last Mod.	-
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Size	A3
Rev	-
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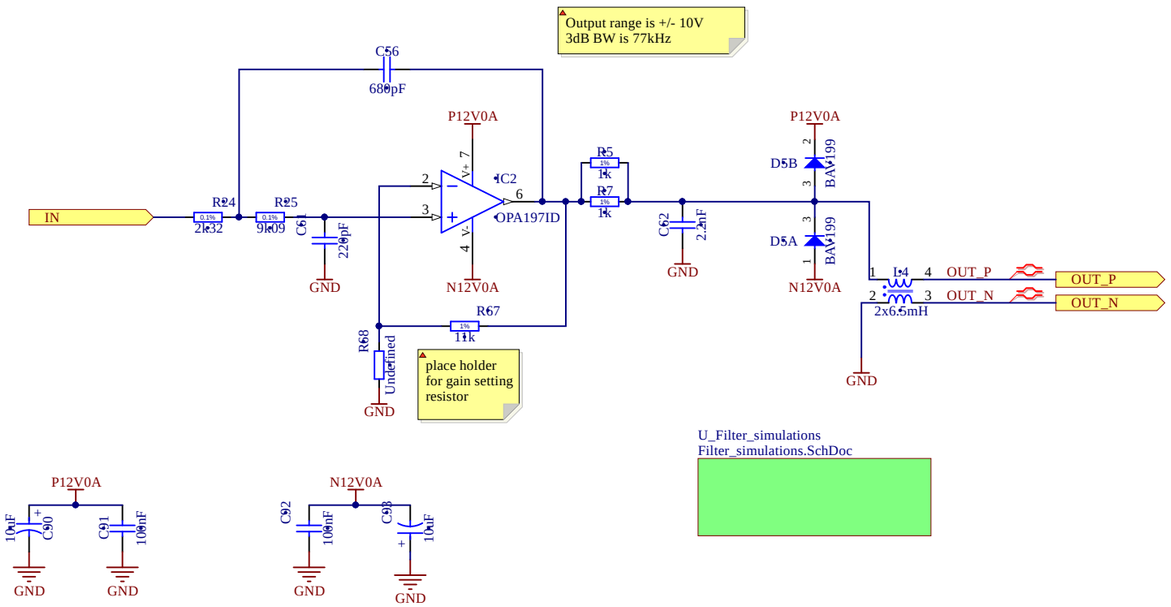
Author	Warsaw Univeristy of Technology ISE Nowowiejska 15/19
	ARTIQ
	XX/XX/XXXX
	15.08.2018



Project/Equipment: Zotino

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Output filter v1.2

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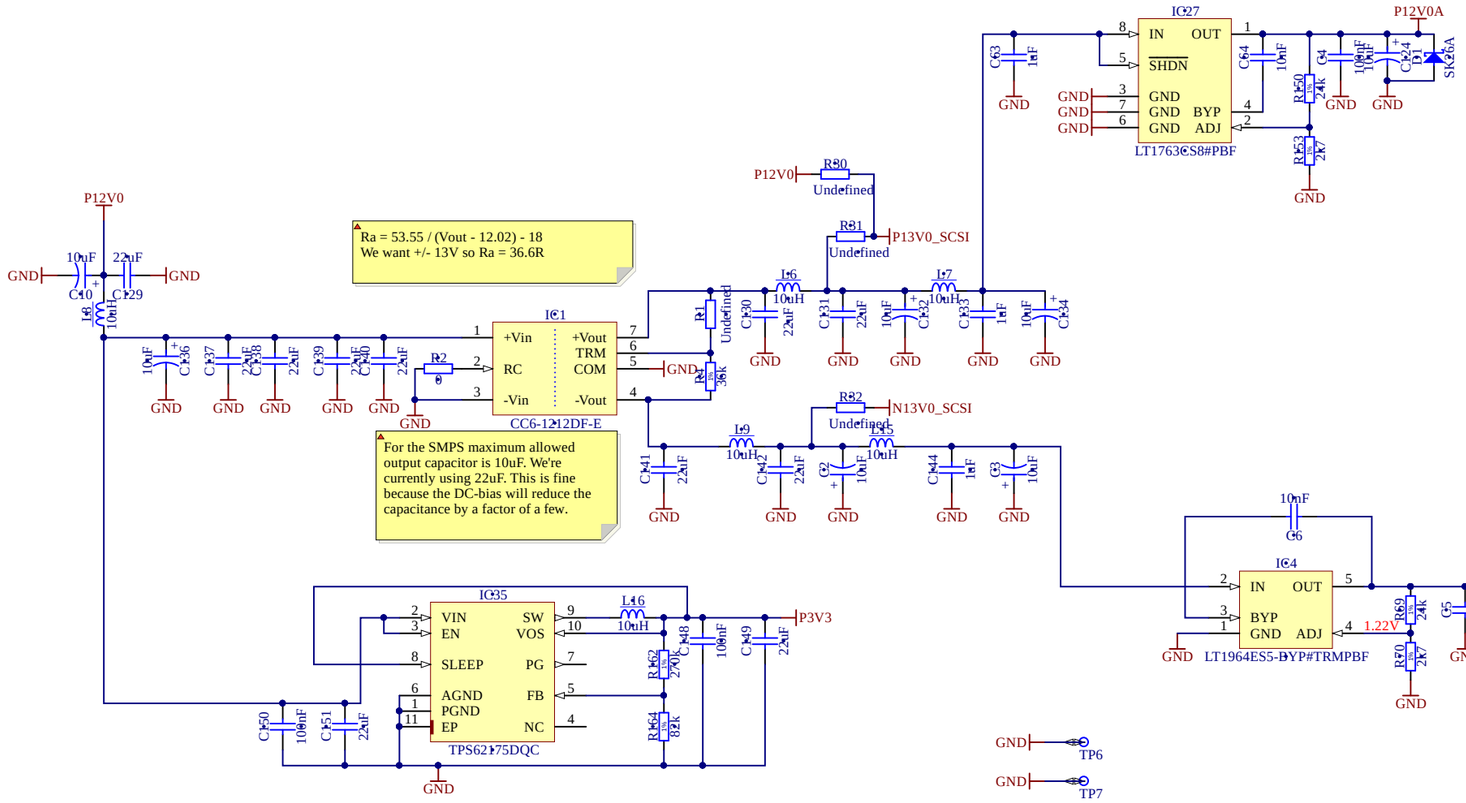
ARTIQ

Size A3 | Rev -



Power budget:

opamp OPA197:	+13V rail	-13V rail	3.3V
32*1.5mA=48mA	48mA	48mA	
opam load 32*0.5mA	16mA	16mA	
DAC5373			
IDvcc 2mA 3.3V			2mA
Ivss -18mA -12V		18mA	
Ivdd 16mA 12V	16mA		
Reference	3mA		
SCSI connector	0mA	0mA	
LVDS interface 2x			330mA
LVDS load 4x24mA			96mA
Total load max	183mA	182mA	428mA
Total load min	64mA	63mA	250mA
Power max	2.3W	2.3W	1.4W
Power min	0.83	0.83	0.8
DC/DC converter losses	max: 0.92W; min:0.32		

Total power max (SCSI 2x 0mA + 0.5mA per out amp + 4 active LVDS outputs) 5.1W = 0.42A@12V
Total power min (just supply current, 2 active LVDS) 3.02W = 0.25A@12V

Power budget does not include TEC driver

Project/Equipment: Zotino

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Zotino
Power supply v1.2

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Drawn by	G.K.
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Last Mod.	-
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Print Date	15.08.2018 14:03:40

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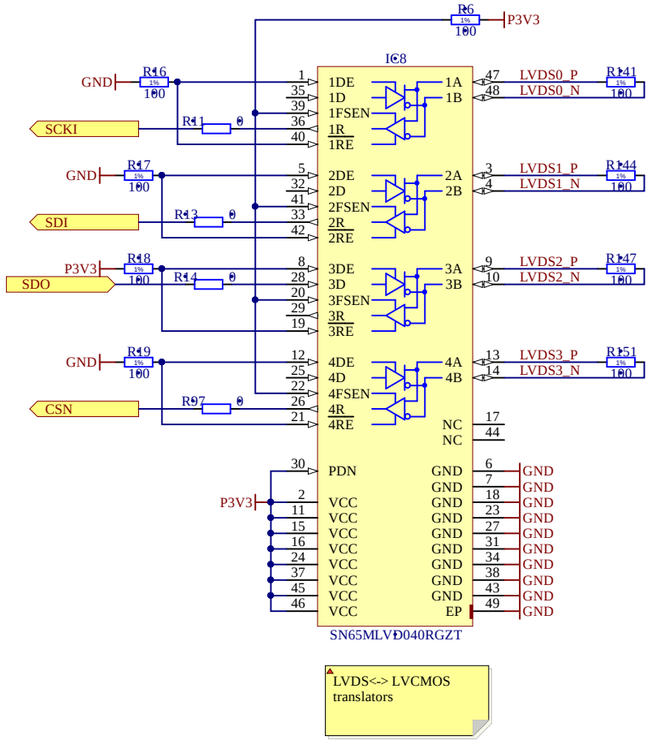
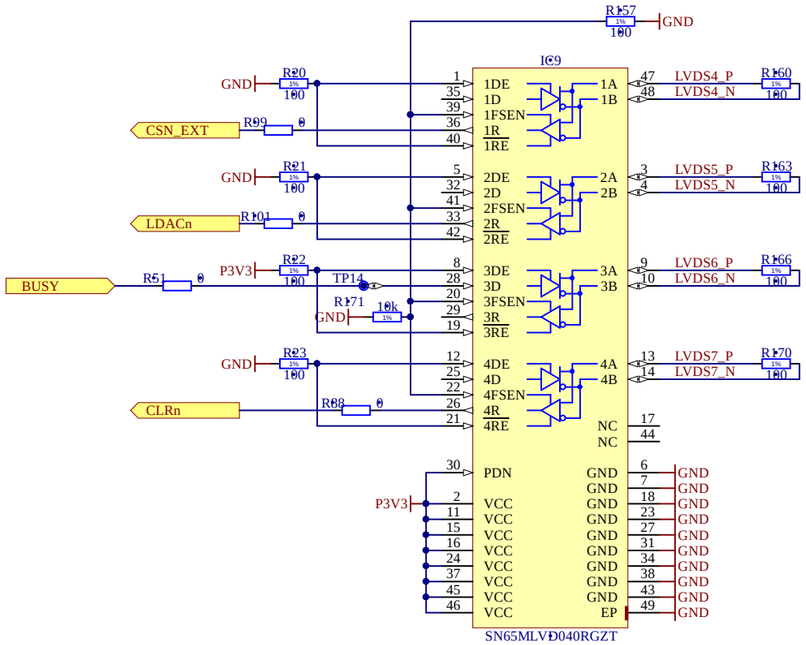
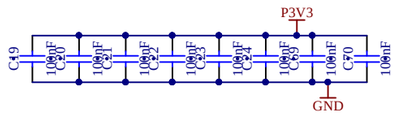
14.08.2018
Sheet 5 of 7
Size A3
Rev -

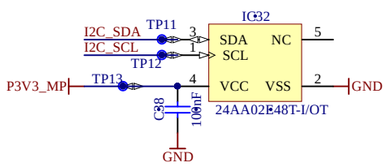


LVDS<-> LVCMOS translators

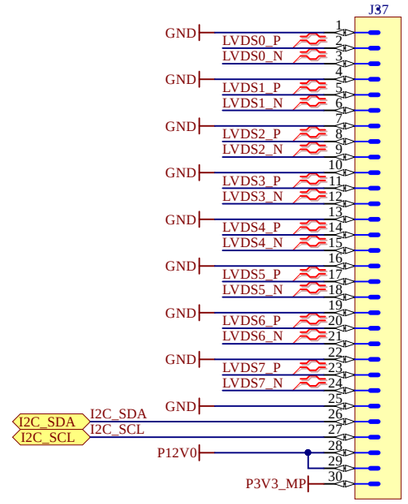




EEPROM



EEM connector: IO are LVDS, I2C is 3V3 LVCMOS, P3V3_MP up to 20mA, P12V up to 1A.



Project/Equipment	Zotino		
Document	***LVDS & I2C interfaces v1.2***	Designer G.K.	
		Drawn by G.K.	XX/XX/XXXX
		Check.by	-
		Last Mod. -	21.03.2018
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		Print Date 15.08.2018 14:03:40	Sheet 7 of 7
	Warsaw Univeristy of Technology Nowowiejska 15/19 *ISE*	ARTIQ	Size A3 / Rev -