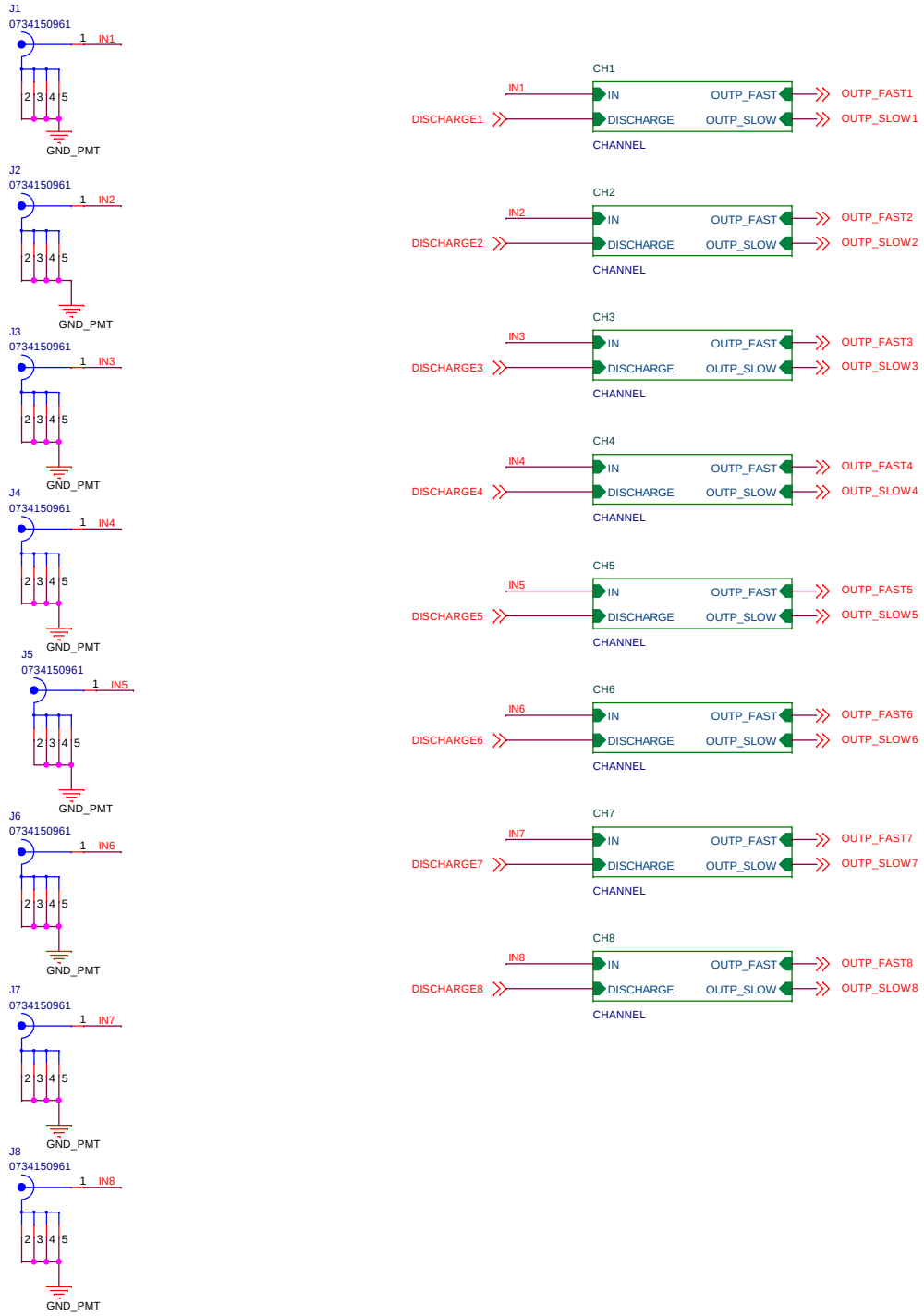


Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
GERMANY
www.gsi.de

01_Molex-Connector

Design:	K:\GSI\JOB\COME_AND_KISS\PANDA-DIRC-WASA\PADIWA-AMPS2\PADIWA-AMPS2.DSN	
Modified: Wednesday, March 15, 2017	Size: A3	Page: 1 / 27
Designer: M.Traxler	Layouter: H.Kavan	

frei vertauschbar zwischen LVDS-Paaren

UMACH1F Bank 0 TOP

CON7	C4	PT9A_0_T_TLVDS
CON8	B5	PT9B_0_C_TLVDS
	B3	PT9C_0_T
CON3	A4	
CON4	C5	PT10A_0_T_TLVDS
CON5	A5	PT10B_0_C_TLVDS
CON6	B6	PT11A_0_T_TLVDS
CON1	A3	PT11B_0_C_TLVDS
CON2	B4	PT12A_0_T_TLVDS
CON9	D6	PT12B_0_C_TLVDS
CON10	E7	PT14A_0_T_TLVDS
CON11	B7	PT14B_0_C_TLVDS
CON12	C7	PT15A_0_T_TLVDS
CON13	E6	PT15B_0_C_TLVDS
CON14	D7	PT16A_0_T_TLVDS
CON15	F7	PT16B_0_C_TLVDS
CON16	E8	PT17A_0_T_TLVDS
	C8	PT17B_0_C_TLVDS
TMP_ALERT	A8	PT18A_0_PCLKT0_1_T_TLVDS
SPARE_LINE4	D8	PT18B_0_PCLKC0_1_C_TLVDS
SPARE_LINE5	E9	PT21A_0_T_TLVDS
CON17	F8	PT21B_0_C_TLVDS
CON18	D9	PT22A_0_T_TLVDS
	A9	PT22B_0_C_TLVDS
I2C_SCL	C9	PT22C_0_SCL/PCLKT0_0_T
I2C_SDA	B9	PT22D_0_SDA/PCLKC0_0_C
CON19	A10	PT25A_0_T_TLVDS
CON20	F9	PT25B_0_C_TLVDS
CON23	E11	PT26A_0_T_TLVDS
CON24	D10	PT26B_0_C_TLVDS
CON21	E10	PT27A_0_T_TLVDS
CON22	A11	PT27B_0_C_TLVDS
CON25	C11	PT28A_0_T_TLVDS
CON26	F10	PT28B_0_C_TLVDS
	D11	PT32A_0_T_TLVDS
CON27	B11	PT32B_0_C_TLVDS
CON28	A12	PT33A_0_T_TLVDS
CON31	B13	PT33B_0_C_TLVDS
CON32	A14	PT34A_0_T_TLVDS
CON29	C12	PT34B_0_C_TLVDS
CON30	B12	PT35A_0_T_TLVDS
SPI_OUT_P	B14	PT35B_0_C_TLVDS
SPI_OUT_N	A15	PT36A_0_T_TLVDS
		PT36B_0_C_TLVDS

LCMXO3LF-6900C-6BG256C

I2C_SCL und I2C_SDA müssen an den pins bleiben

beliebig vertauschbar und verteilbar auf Bank

UMACH1A Bank 1 RIGHT

SPI_IN_P	D14	PR2A_1_R_GPLLT_FB_T
SPI_IN_N	E15	PR2B_1_R_GPLLC_FB_C
SPI_CS_P	C15	PR2C_1_T
SPI_CS_N	B16	PR2D_1_C
SPI_CLK_P	D16	PR3A_1_R_GPLLT_IN_T
SPI_CLK_N	E14	PR3B_1_R_GPLLC_IN_C
	C16	PR4C_1_T
	D15	PR4D_1_C
	E16	PR5A_1_T
	F15	PR5B_1_C
	F13	PR6C_1_T
	G12	PR6D_1_C
PWM14	F14	PR7A_1_T
PWM16	F16	PR7B_1_C
PWM12	F12	PR7C_1_T
	G13	PR7D_1_C
LEDCHAN8	G15	PR9A_1_T
	G14	PR9B_1_C
PWM9	G11	PR10C_1_T
	H12	PR10D_1_C
	G16	PR11A_1_T
	H15	PR11B_1_C
	H13	PR11C_1_T
	J12	PR11D_1_C
OSC_CORE_P	H14	PR12A_1_PCLKT1_0_T
OSC_CORE_N	H16	PR12B_1_PCLKC1_0_C
	J16	PR15A_1_T
	J14	PR15B_1_C
LEDCHAN7	J15	PR16A_1_T
PWM15	K16	PR16B_1_C
PWM11	H11	PR16C_1_T
	J13	PR16D_1_C
PWM13	K14	PR17A_1_T
LEDCHAN6	K15	PR17B_1_C
	J11	PR17C_1_T
	L12	PR17D_1_C
LEDCHAN5	L16	PR18A_1_T
	L14	PR18B_1_C
	K13	PR19C_1_T
	K12	PR19D_1_C
	L15	PR21A_1_T
LEDCHAN3	M16	PR21B_1_C
	K11	PR21C_1_T
	L13	PR21D_1_C
LEDCHAN4	M14	PR23A_1_T
LEDCHAN2	M15	PR23B_1_C
LEDCHAN1	P16	PR23C_1_T
SPARE_LINE0	N16	PR23D_1_C
SPARE_LINE1	N15	PR24A_1_T
SPARE_LINE2	N14	PR24B_1_C
SPARE_LINE3	P15	PR25C_1_T
	R16	PR25D_1_C

LCMXO3LF-6900C-6BG256C

beliebig vertauschbar und verteilbar auf Bank

Bank 3 LEFT (Bottom)

UMACH1C

	L1	PL19A_3_T
	L3	PL19B_3_C
	K4	PL19C_3_T
	L5	PL19D_3_C
	K5	PL21C_3_T
PWM6	L4	PL21D_3_C
TEST_LINE9	L2	PL22A_3_PCLKT3_0_T
TEST_LINE11	M1	PL22B_3_PCLKC3_0_C
TEST_LINE12	N2	PL23C_3_T
	P1	PL23D_3_C
	M3	PL24A_3_T
	N1	PL24B_3_C
TEST_LINE10	M2	PL25A_3_T
	N3	PL25B_3_C
	R1	PL25C_3_T
TEST_LINE13	P2	PL25D_3_C

LCMXO3LF-6900C-6BG256C

frei vertauschbar in der Bank

Bank 4 LEFT (Middle)

UMACH1D

TEST_LINE4	G1	PL10A_4_T
TEST_LINE5	H2	PL10B_4_C
	H4	PL10C_4_T
	J6	PL10D_4_C
	H3	PL11A_4_T
TEST_LINE6	H1	PL11B_4_C
TEST_LINE8	J1	PL12A_4_PCLKT4_0_T
	J3	PL12B_4_PCLKC4_0_C
TEST_LINE7	J2	PL15A_4_T
PWM1	K1	PL15B_4_C
	H5	PL15C_4_T
PWM8	J4	PL15D_4_C
	J5	PL16C_4_T
	K6	PL16D_4_C
	K3	PL17A_4_T
PWM5	K2	PL17B_4_C

LCMXO3LF-6900C-6BG256C

beliebig vertauschbar und verteilbar auf Bank

Bank 5 LEFT (TOP)

UMACH1E

	B1	PL2C_5_T
	C2	PL2D_5_C
	D3	PL3A_5_L_GPLLT_FB_T
TEST_LINE1	D1	PL3B_5_L_GPLLC_FB_C
TEST_LINE2	E2	PL4A_5_L_GPLLT_IN_T
	E3	PL4B_5_L_GPLLC_IN_C
	C1	PL4C_5_T
TEST_LINE0	D2	PL4D_5_C
TEST_LINE3	E1	PL6A_5_PCLKT5_0_T
PWM4	F2	PL6B_5_PCLKC5_0_C
	F4	PL6C_5_T
PWM10	G6	PL6D_5_C
	G5	PL7C_5_T
	G4	PL7D_5_C
PWM3	F3	PL8A_5_T
PWM2	F1	PL8B_5_C
	G2	PL9A_5_T
	G3	PL9B_5_C
	P5	PL9C_5_T
PWM7	H6	PL9D_5_C

LCMXO3LF-6900C-6BG256C

DAC1
REF1 — DAC_OUT — PWM_IN — PWM1
PWM_DAC

DAC2
REF2 — DAC_OUT — PWM_IN — PWM2
PWM_DAC

DAC3
REF3 — DAC_OUT — PWM_IN — PWM3
PWM_DAC

DAC4
REF4 — DAC_OUT — PWM_IN — PWM4
PWM_DAC

DAC5
REF5 — DAC_OUT — PWM_IN — PWM5
PWM_DAC

DAC6
REF6 — DAC_OUT — PWM_IN — PWM6
PWM_DAC

DAC7
REF7 — DAC_OUT — PWM_IN — PWM7
PWM_DAC

DAC8
REF8 — DAC_OUT — PWM_IN — PWM8
PWM_DAC

DAC9
REF9 — DAC_OUT — PWM_IN — PWM9
PWM_DAC

DAC10
REF10 — DAC_OUT — PWM_IN — PWM10
PWM_DAC

DAC11
REF11 — DAC_OUT — PWM_IN — PWM11
PWM_DAC

DAC12
REF12 — DAC_OUT — PWM_IN — PWM12
PWM_DAC

DAC13
REF13 — DAC_OUT — PWM_IN — PWM13
PWM_DAC

DAC14
REF14 — DAC_OUT — PWM_IN — PWM14
PWM_DAC

DAC15
REF15 — DAC_OUT — PWM_IN — PWM15
PWM_DAC

DAC16
REF16 — DAC_OUT — PWM_IN — PWM16
PWM_DAC

UMACH1B Bank 2 BOTTOM

DISCHARGE1	OUTP_FAST1	T4	PB4A_2_T
OUTP_FAST1		T2	PB4B_2_C
	REF1	R3	PB4C_2_T
OUTP_FAST2	OUTP_FAST2	R5	PB4D_2_C
	REF3	P5	PB6A_2_CSSPIN_T
OUTP_SLOW1	OUTP_SLOW1	T3	PB6B_2_C
	REF2	R4	PB7A_2_T
OUTP_SLOW2	OUTP_SLOW2	T5	PB7B_2_C
	REF4	R6	PB9A_2_T
DISCHARGE2		N6	PB9B_2_C
		L7	PB10A_2_T
		P6	PB10B_2_C
OUTP_FAST3	OUTP_FAST3	T6	PB12A_2_MCLK/CCLK_T
OUTP_SLOW3	OUTP_SLOW3	R7	PB12B_2_SO/SPISO_C
	REF6	P7	PB13A_2_T
		M7	PB13B_2_C
		N7	PB13C_2_T
DISCHARGE3		M6	PB13D_2_C
DISCHARGE4		L8	PB15A_2_T
		P8	PB15B_2_C
OUTP_FAST4	OUTP_FAST4	T7	PB16A_2_PCLKT2_0_T
	REF7	R8	PB16B_2_PCLKC2_0_C
OUTP_SLOW4	OUTP_SLOW4	P8	PB18A_2_T
	REF8	T8	PB18B_2_C
		N8	PB18C_2_T
		L9	PB18D_2_C
		M8	PB21A_2_T
DISCHARGE5		N9	PB21B_2_C
OUTP_SLOW5	OUTP_SLOW5	T9	PB23A_2_PCLKT2_1_T
	REF10	P9	PB23B_2_PCLKC2_1_C
OUTP_FAST5	OUTP_FAST5	R9	PB26A_2_T
	REF9	T10	PB26B_2_C
		M9	PB26C_2_T
DISCHARGE6		L10	PB26D_2_C
		N10	PB28A_2_T
		M11	PB28B_2_C
OUTP_FAST6	OUTP_FAST6	P10	PB29A_2_T
	REF11	R10	PB29B_2_C
OUTP_SLOW6	OUTP_SLOW6	T11	PB31A_2_T
	REF12	P11	PB31B_2_C
		M10	PB31C_2_T
		N11	PB31D_2_C
OUTP_FAST8	OUTP_FAST8	R13	PB34A_2_T
	REF15	T14	PB34B_2_C
OUTP_FAST7	OUTP_FAST7	R11	PB35A_2_T
	REF13	T12	PB35B_2_C
		P12	PB37A_2_T
DISCHARGE7		T13	PB37B_2_C
DISCHARGE8		R12	PB38A_2_SN_T
OUTP_SLOW7	OUTP_SLOW7	P13	PB38B_2_SI/SISPI_C
	REF14	T15	PB38C_2_T
OUTP_SLOW8	OUTP_SLOW8	R14	PB38D_2_C
	REF16		

LCMXO3LF-6900C-6BG256C

in Paaren frei verteilbar

OUT_XXX müssen sehr dicht (gleiche PBXX-Nummer) liegen

Bottom side: All LVDS receiver can have a termination resistors.
OUTP is an input to the FPGA
frei vertauschbar
(in LVDS Paaren)

V2_5 — C1 100n — R1 10k — XOSC_CAL1 (6) — VDD, NC, CLK+, OE, CLK-, GND — 5G3225VAN — OSC_CORE_P, OSC_CORE_N

Frequenz: nicht so wichtig, ist für interne kalibration.

Vreg — DL1 SML-P11MT green — R161 1.47k — LEDCHAN1
DL2 SML-P11MT — R162 1.47k — LEDCHAN2
DL3 SML-P11MT — R163 1.47k — LEDCHAN3
DL4 SML-P11MT — R164 1.47k — LEDCHAN4
DL5 SML-P11MT — R165 1.47k — LEDCHAN5
DL6 SML-P11MT — R166 1.47k — LEDCHAN6
DL7 SML-P11MT — R167 1.47k — LEDCHAN7
DL8 SML-P11MT — R168 1.47k — LEDCHAN8

Vreg — UTMP1 TMP108 (I2C_SCL, I2C_SDA, TMP_ALERT; SCL, SDA, ALERT, A0, V+, GND, A1, A2) — address: 1001000

Vreg — R159 2k, R160 2k — I2C_SCL, I2C_SDA — UUID1 24AA02UID (SCL, SDA, VCC, VSS) — address: 1010XXX

JTriggOut1 — SPARE_LINE4, SPARE_LINE5

JGND1 — GND

Trigger Out

GND

Vreg — JJTAG1 — F_JTAG_TMS, F_JTAG_TCK, F_JTAG_TDO, F_JTAG_TDI — R141 4.7k — GND — TEST_LINE0 … TEST_LINE13

PIN
1 +3.3V
2 TMS
3 TCK
4 TDO
5 TDI
6 GND

Place JTAG connector close to the edge

sd-52892

UMACH1I JTAG Bank 0 TOP

F_JTAG_TDI	A6	PT14D_0_TDI_C
F_JTAG_TDO	C6	PT14C_0_TDO_T
F_JTAG_TCK	A7	PT17C_0_TCK_T
F_JTAG_TMS	B8	PT17D_0_TMS_C
	A13	
	C13	PT36C_0_INITN_T
	B10	PT36D_0_DONE_C
	C10	PT27D_0_PROGRAMN_C
		PT27C_0_JTAGENB_T

LCMXO3LF-6900C-6BG256C

Vreg — R7 10k, R8 10k, R5 10k, R9 10k — Vreg

JOUT1

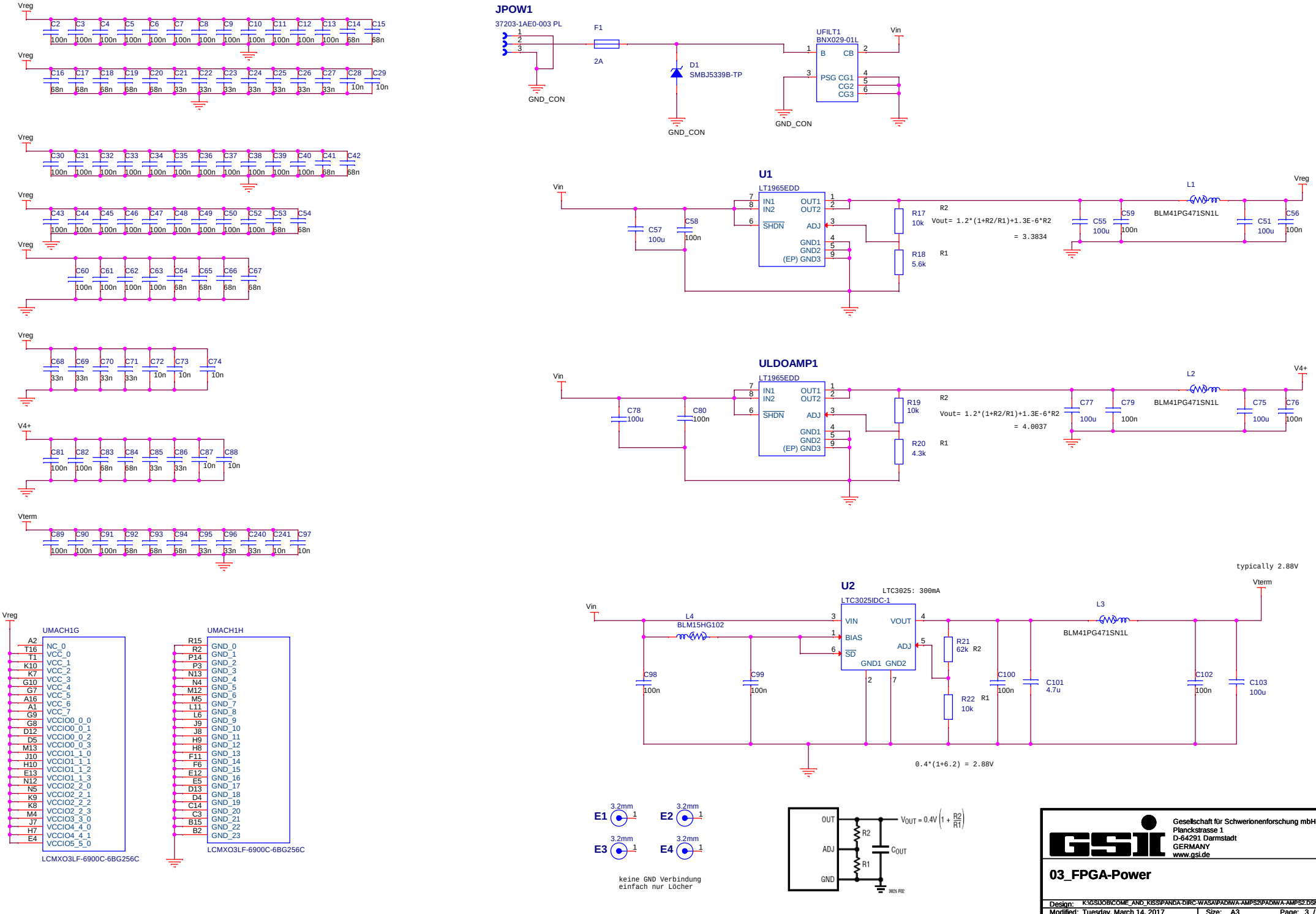
CON1	1	2	CON2
CON3	3	4	CON4
CON5	5	6	CON6
CON7	7	8	CON8
CON9	9	10	CON10
CON11	11	12	CON12
CON13	13	14	CON14
CON15	15	16	CON16
CON17	17	18	CON18
CON19	19	20	CON20
CON21	21	22	CON22
CON23	23	24	CON24
CON25	25	26	CON26
CON27	27	28	CON28
CON29	29	30	CON30
CON31	31	32	CON32
SPI_OUT_P	33	34	SPI_OUT_N
SPI_IN_P	35	36	SPI_IN_N
SPI_CLK_P	37	38	SPI_CLK_N
SPI_CS_P	39	40	SPI_CS_N

8930E-040-178-MS

Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
GERMANY
www.gsi.de

02_FPGA-Logic

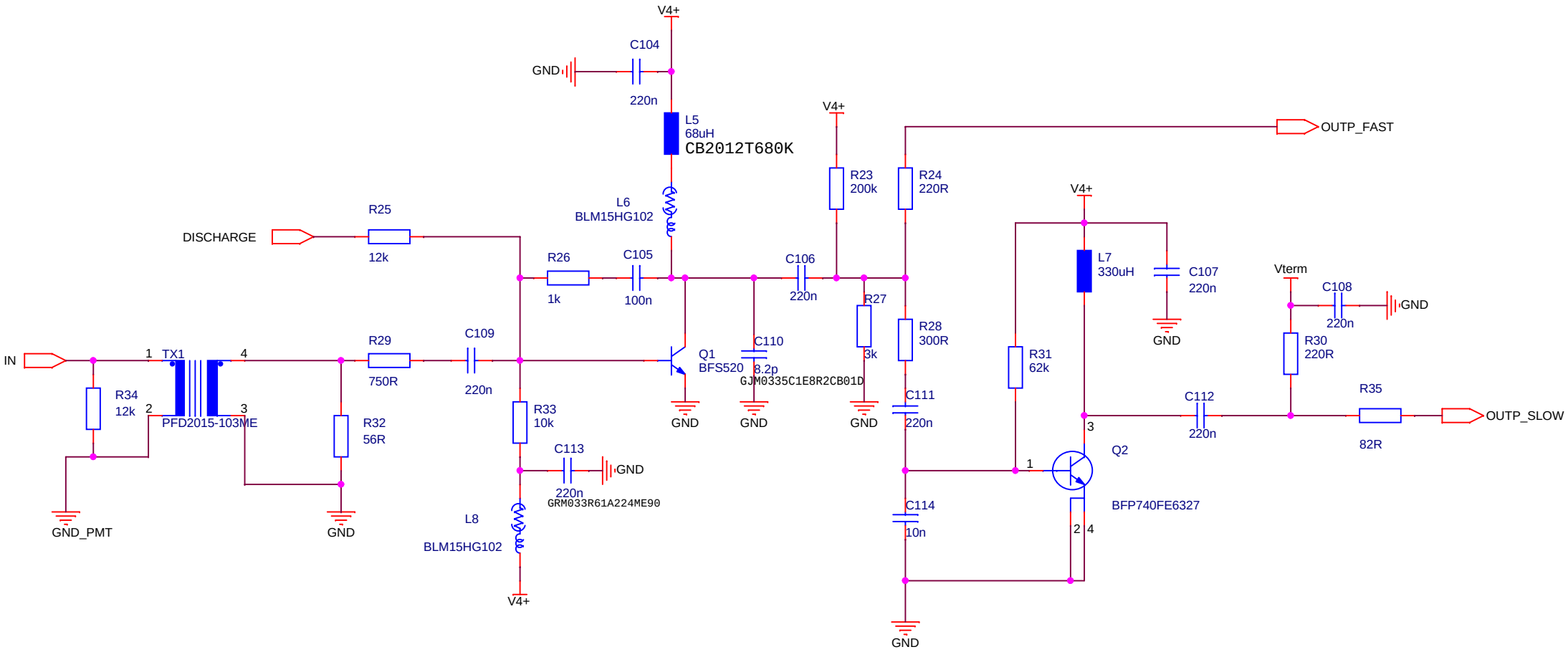
Design:	K:\GSJOB\COME_AND_RISSIPANDA.DIR\C-WASA\PADIWA-AMP32\PADIWA-AMP32.DSN
Modified: Tuesday, March 14, 2017	Size: A2 Page: 2 / 22
Designer: M.Taylor	Lanquage: H.Kavan



Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
GERMANY
www.gsi.de

03_FPGA-Power

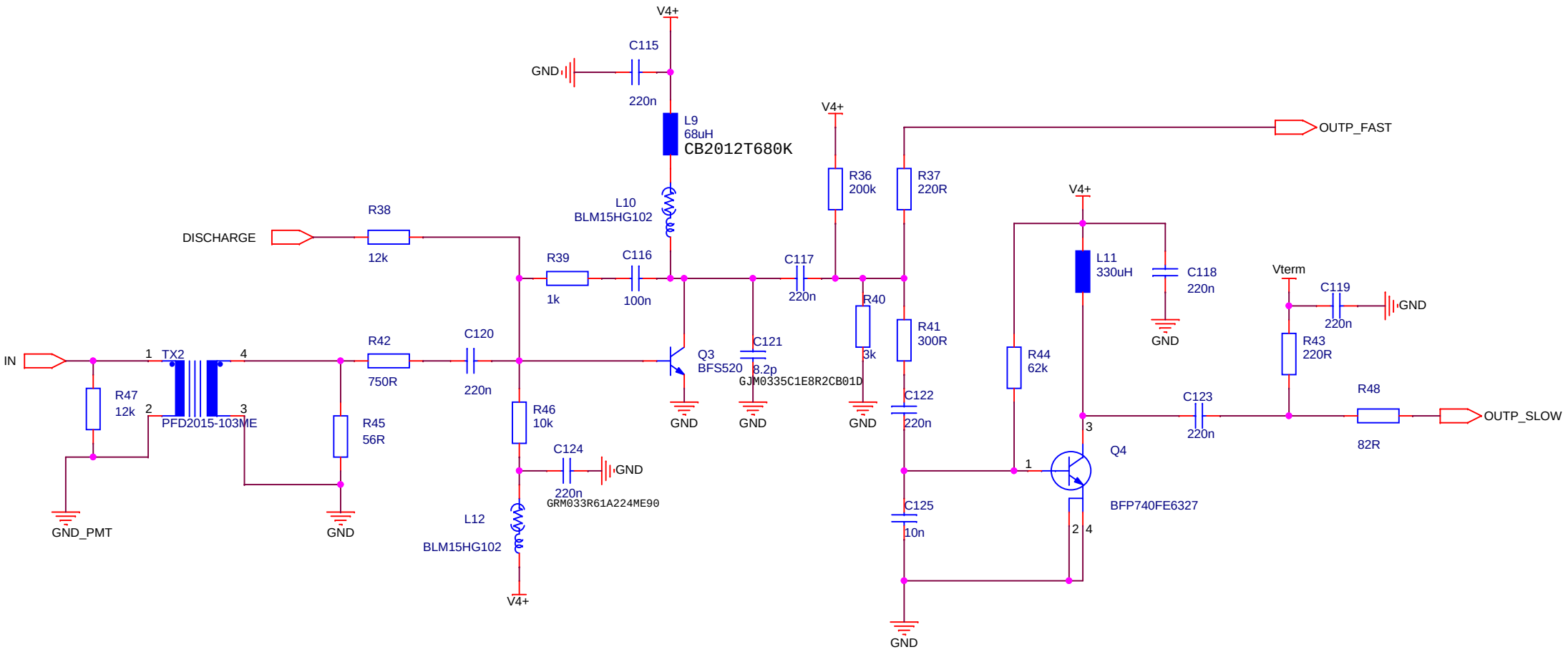
Design: K:\GSI\JOB\COME_AND_KISS\PANDA-DIRC-WASA\PADIWA-AMPS2\PADIWA-AMPS2.DSN		
Modified: Tuesday, March 14, 2017	Size: A3	Page: 3 / 27
Designer: M.Traxler	Layouter: H.Kavan	



Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
GERMANY
www.gsi.de

Channel_P

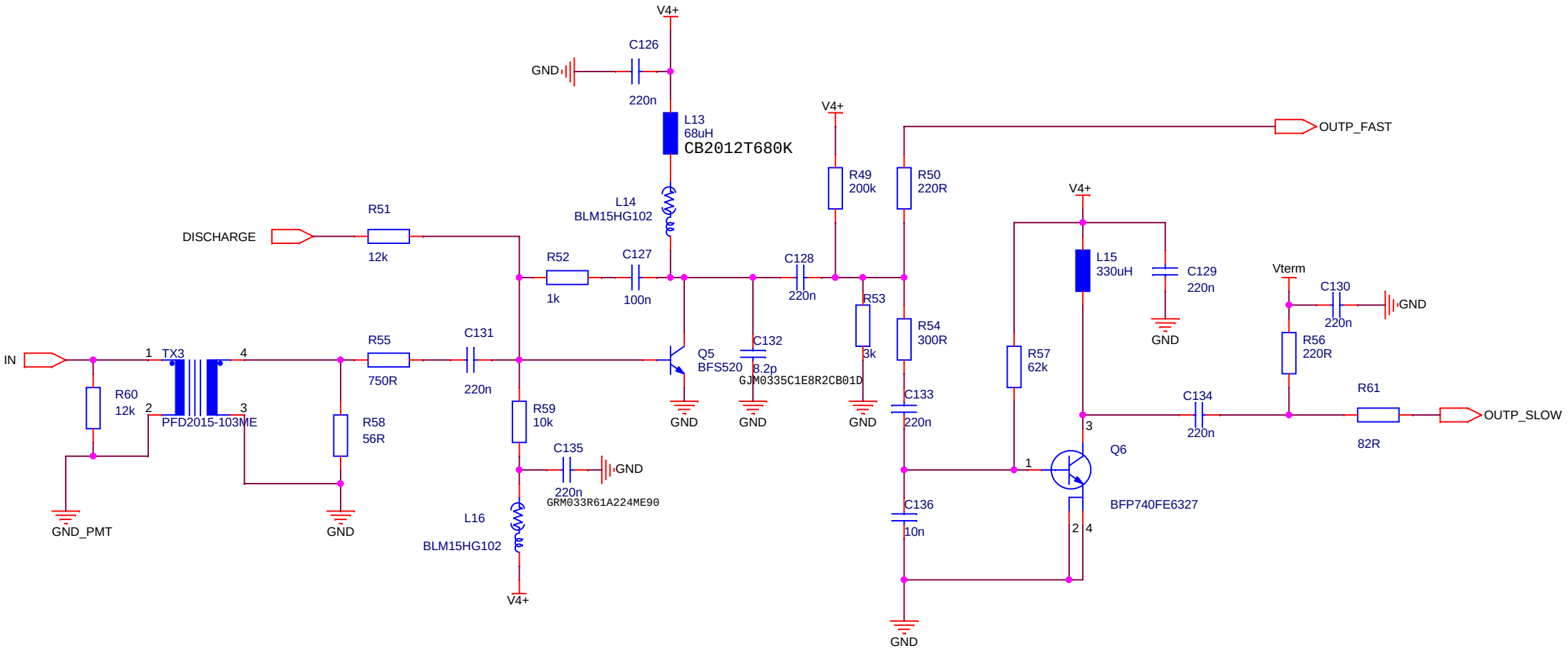
Design: K:\GSIJOB\COME_AND_KISS\PANDA-DIRC-WASA\PADIWA-AMPS2\PADIWA-AMPS2.DSN		
Modified: Wednesday, March 15, 2017	Size: A4	Page: 4 / 27
Designer: M.Traxler	Layouter: H.Kavan	



Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
GERMANY
www.gsi.de

Channel_P

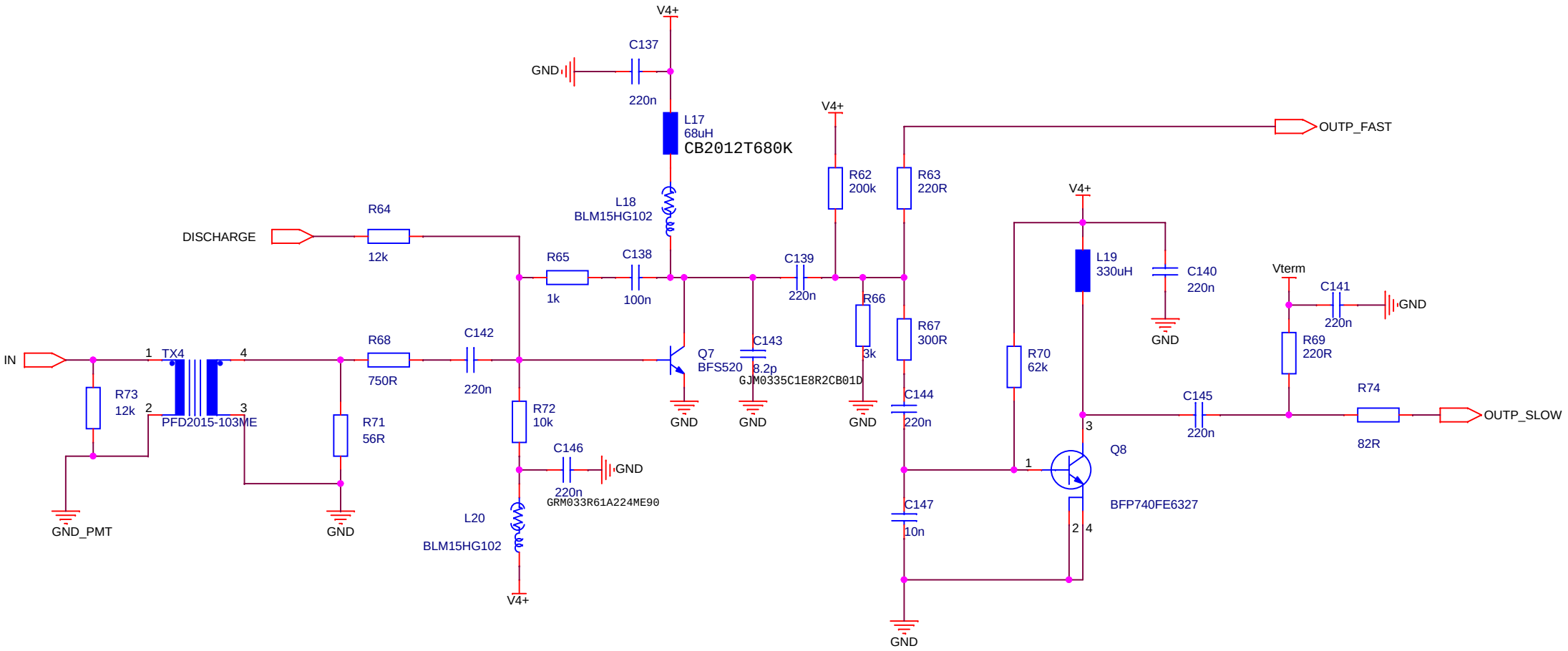
Design: K:\GSIJOB\COME_AND_KISS\PANDA-DIRC-WASA\PADIWA-AMPS2\PADIWA-AMPS2.DSN		
Modified: Wednesday, March 15, 2017	Size: A4	Page: 5 / 27
Designer: M.Traxler	Layouter: H.Kavan	



Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
GERMANY
www.gsi.de

Channel_P

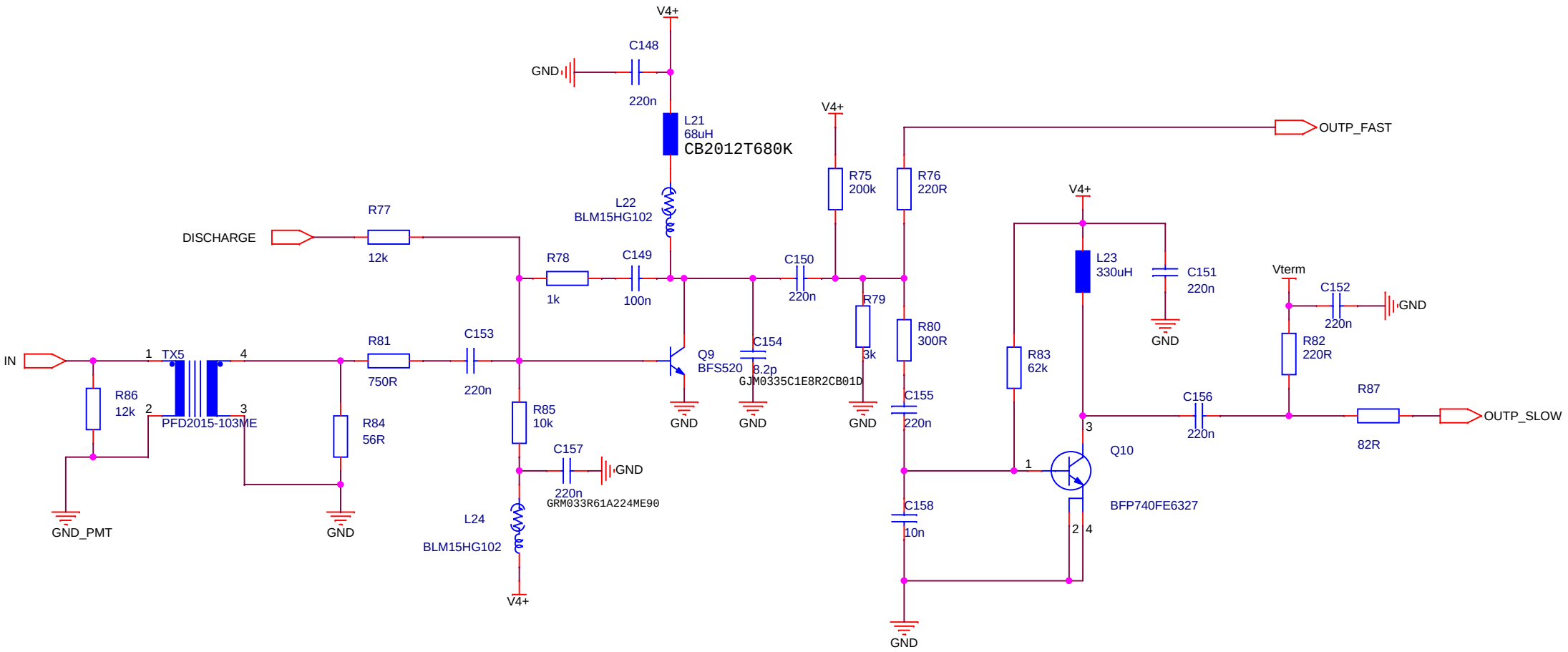
Design: K:\GSIJOB\COME_AND_KISS\PANDA-DIRC-WASA\PADIWA-AMPS2\PADIWA-AMPS2.DSN		
Modified: Wednesday, March 15, 2017	Size: A4	Page: 6 / 27
Designer: M.Traxler	Layouter: H.Kavan	



Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
GERMANY
www.gsi.de

Channel_P

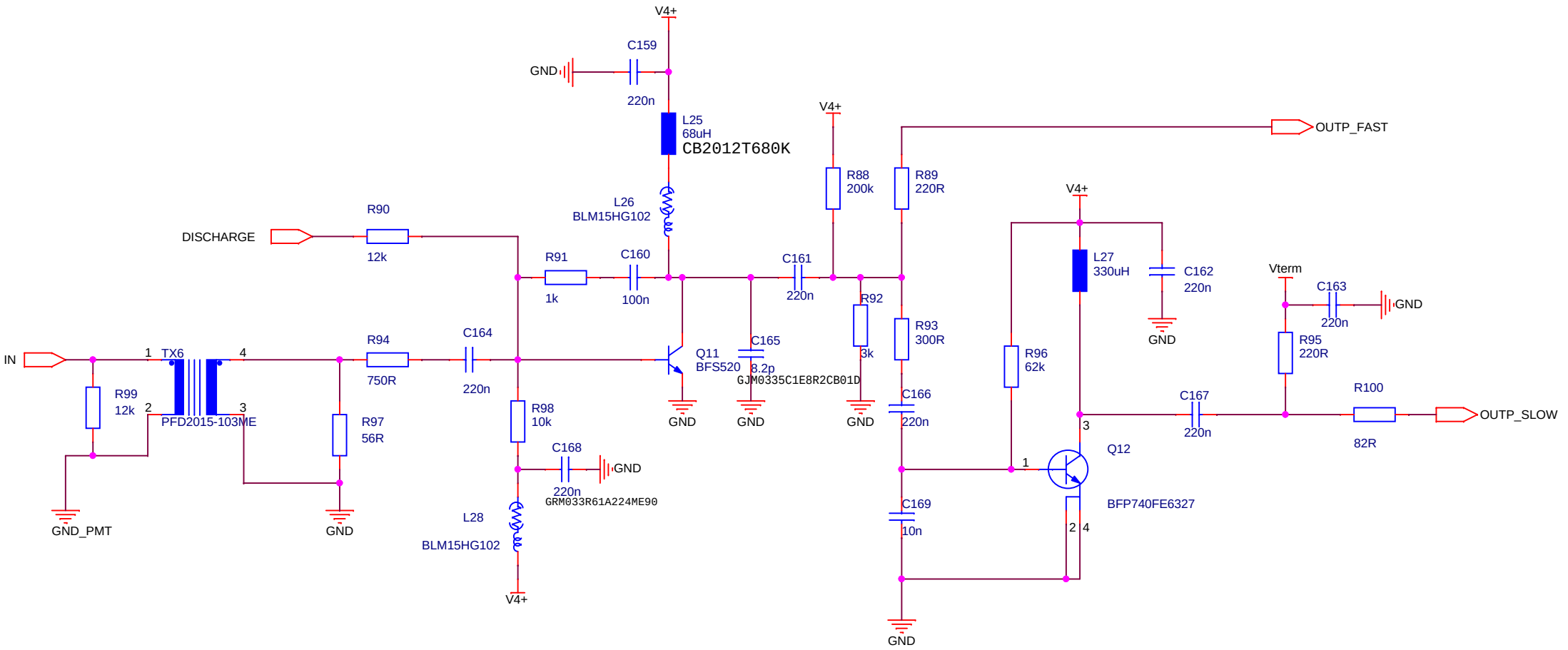
Design: K:\GSIJOB\COME_AND_KISS\PANDA-DIRC-WASA\PADIWA-AMPS2\PADIWA-AMPS2.DSN
Modified: Wednesday, March 15, 2017 Size: A4 Page: 7 / 27
Designer: M.Traxler Layouter: H.Kavan



Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
GERMANY
www.gsi.de

Channel_P

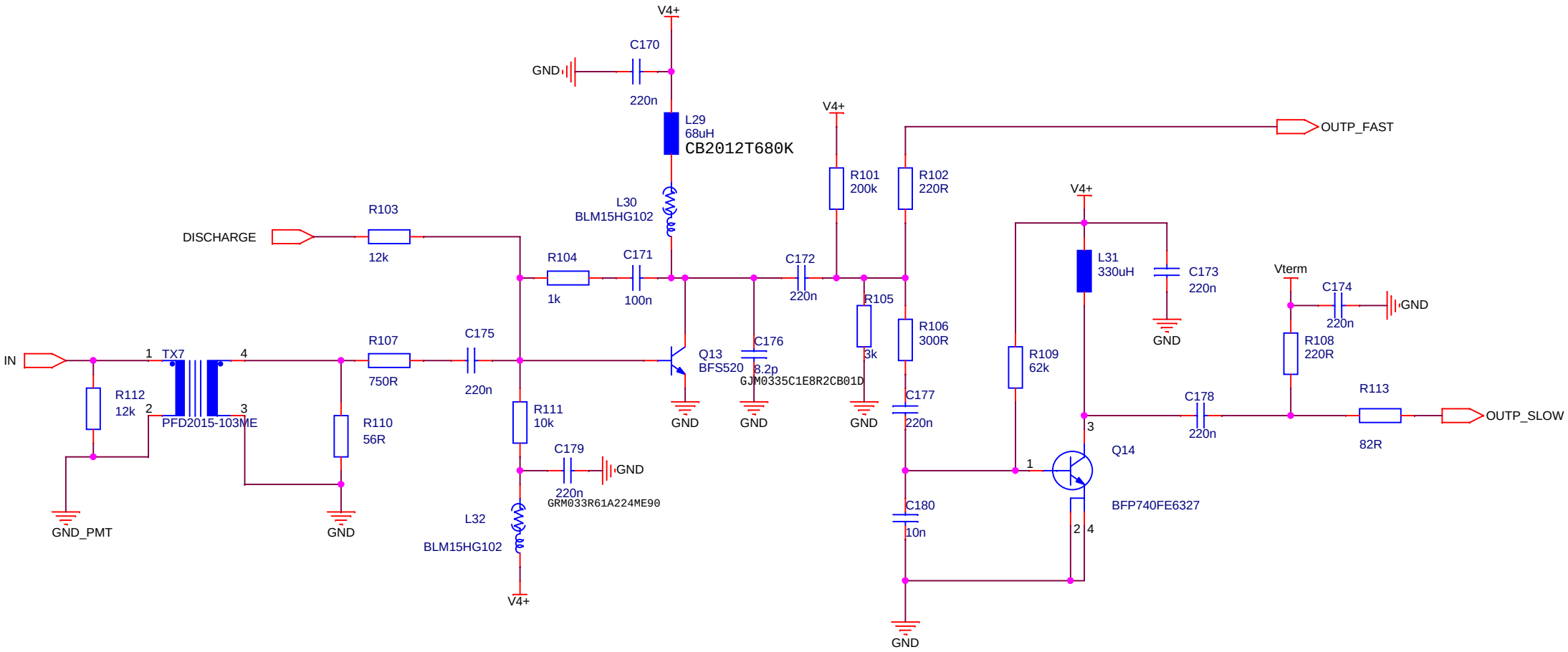
Design: K:\GSIJOB\COME_AND_KISS\PANDA-DIRC-WASA\PADIWA-AMPS2\PADIWA-AMPS2.DSN		
Modified: Wednesday, March 15, 2017	Size: A4	Page: 8 / 27
Designer: M.Traxler	Layouter: H.Kavan	



Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
GERMANY
www.gsi.de

Channel_P

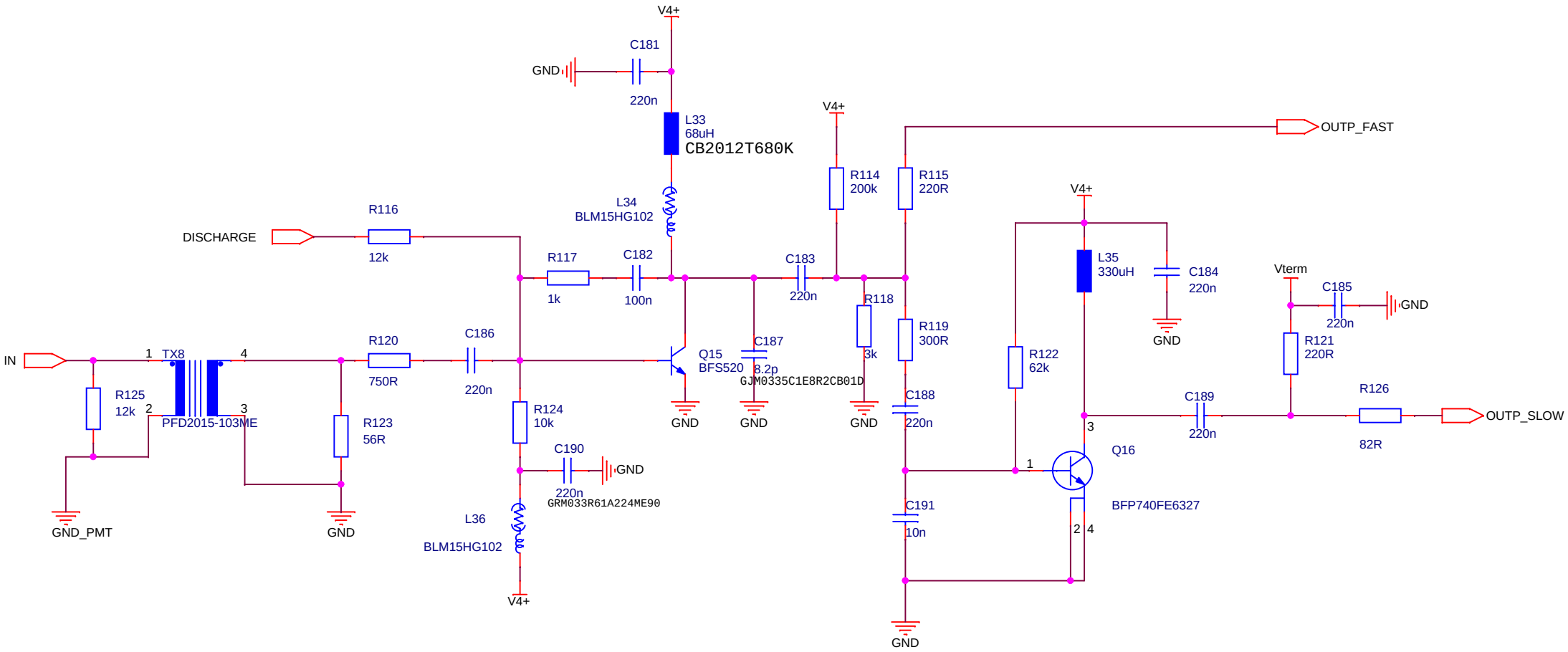
Design: K:\GSIJOB\COME_AND_KISS\PANDA-DIRC-WASA\PADIWA-AMPS2\PADIWA-AMPS2.DSN		
Modified: Wednesday, March 15, 2017	Size: A4	Page: 9 / 27
Designer: M.Traxler	Layouter: H.Kavan	



Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
GERMANY
www.gsi.de

Channel_P

Design: K:\GSIJOB\COME_AND_KISS\PANDA-DIRC-WASA\PADIWA-AMPS2\PADIWA-AMPS2.DSN		
Modified: Wednesday, March 15, 2017	Size: A4	Page: 10/ 27
Designer: M.Traxler	Layouter: H.Kavan	

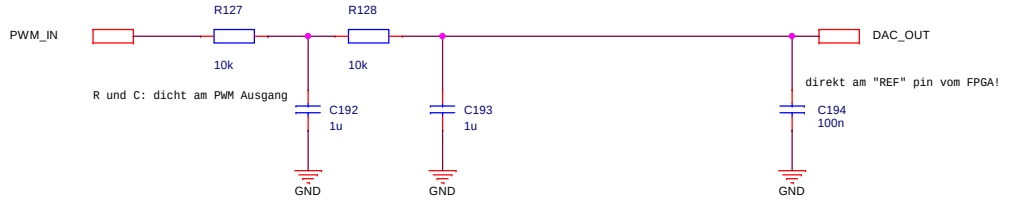


Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY www.gsi.de	
Channel_P	
Design: K:\GSIJOB\COME_AND_KISS\PANDA-DIRC-WASA\PADIWA-AMPS2\PADIWA-AMPS2.DSN	
Modified: Wednesday, March 15, 2017	Size: A4 Page: 11/ 27
Designer: M.Traxler	Layouter: H.Kavan

wire around FPGA, from output side to input side

FPGA-THR

THR-OUT



Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
GERMANY
www.gsi.de

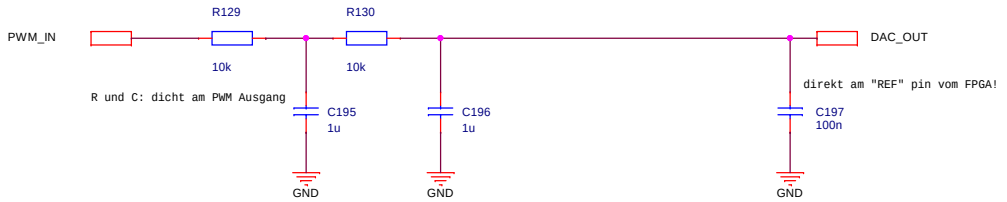
DAC

Design: K:\GSI\JOB\COME_AND_KISS\PANDA-DIRC-WASA\PADIWA-AMPS2\PADIWA-AMPS2.DSN		
Modified: Friday, February 24, 2017	Size: A3	Page: 12/ 27
Designer: M.Traxler	Layouter: H.Kavan	

wire around FPGA, from output side to input side

FPGA-THR

THR-OUT



Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
GERMANY
www.gsi.de

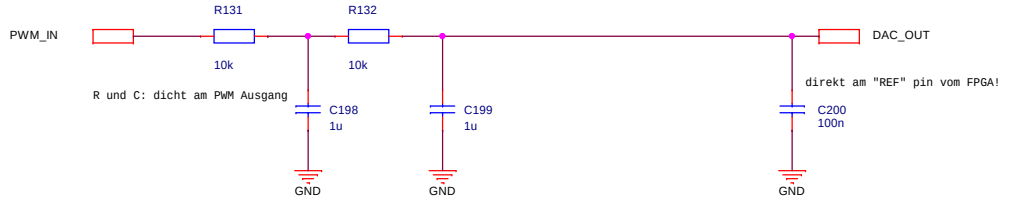
DAC

Design: K:\GSI\JOB\COME_AND_KISS\PANDA-DIRC-WASA\PADIWA-AMPS2\PADIWA-AMPS2.DSN		
Modified: Friday, February 24, 2017	Size: A3	Page: 13/ 27
Designer: M.Traxler	Layouter: H.Kavan	

wire around FPGA, from output side to input side

FPGA-THR

THR-OUT



Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
GERMANY
www.gsi.de

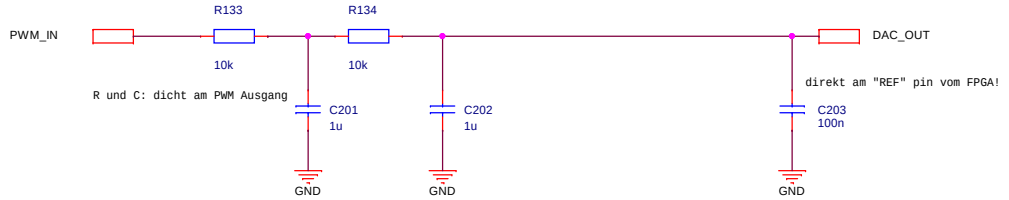
DAC

Design: K:\GSI\JOB\COME_AND_KISS\PANDA-DIRC-WASA\PADIWA-AMPS2\PADIWA-AMPS2.DSN		
Modified: Friday, February 24, 2017	Size: A3	Page: 14/ 27
Designer: M.Traxler	Layouter: H.Kavan	

wire around FPGA, from output side to input side

FPGA-THR

THR-OUT



Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
GERMANY
www.gsi.de

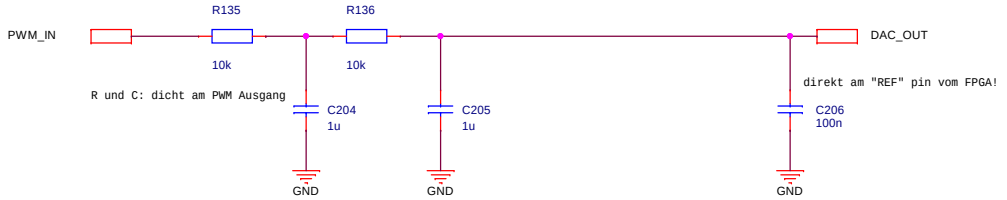
DAC

Design: K:\GSI\JOB\COME_AND_KISS\PANDA-DIRC-WASA\PADIWA-AMPS2\PADIWA-AMPS2.DSN	
Modified: Friday, February 24, 2017	Size: A3 Page: 15/ 27
Designer: M.Traxler	Layouter: H.Kavan

wire around FPGA, from output side to input side

FPGA-THR

THR-OUT



Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
GERMANY
www.gsi.de

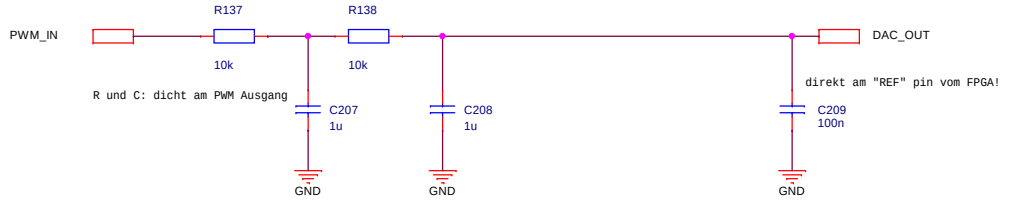
DAC

Design: K:\GSI\JOB\COME_AND_KISS\PANDA-DIRC-WASA\PADIWA-AMPS2\PADIWA-AMPS2.DSN
Modified: Friday, February 24, 2017 | Size: A3 | Page: 16/ 27
Designer: M.Traxler | Layouter: H.Kavan

wire around FPGA, from output side to input side

FPGA-THR

THR-OUT



Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
GERMANY
www.gsi.de

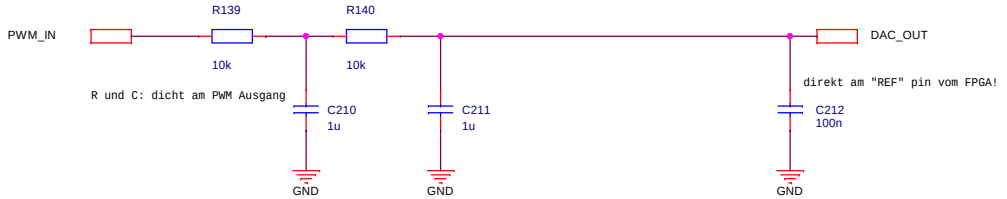
DAC

Design: K:\GSI\JOB\COME_AND_KISS\PANDA-DIRC-WASA\PADIWA-AMPS2\PADIWA-AMPS2.DSN
Modified: Friday, February 24, 2017 | Size: A3 | Page: 17/ 27
Designer: M.Traxler | Layouter: H.Kavan

wire around FPGA, from output side to input side

FPGA-THR

THR-OUT



Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
GERMANY
www.gsi.de

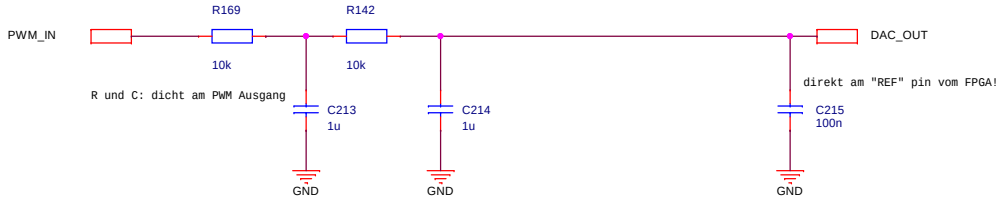
DAC

Design: K:\GSI\JOB\COME_AND_KISS\PANDA-DIRC-WASA\PADIWA-AMPS2\PADIWA-AMPS2.DSN		
Modified: Friday, February 24, 2017	Size: A3	Page: 18/ 27
Designer: M.Traxler	Layouter: H.Kavan	

wire around FPGA, from output side to input side

FPGA-THR

THR-OUT



Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
GERMANY
www.gsi.de

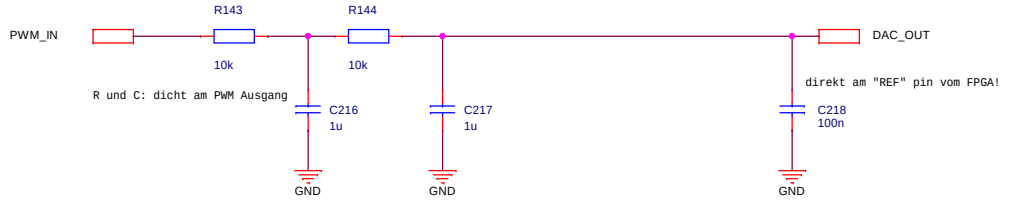
DAC

Design: K:\GSI\JOB\COME_AND_KISS\PANDA-DIRC-WASA\PADIWA-AMPS2\PADIWA-AMPS2.DSN		
Modified: Friday, February 24, 2017	Size: A3	Page: 19/ 27
Designer: M.Traxler	Layouter: H.Kavan	

wire around FPGA, from output side to input side

FPGA-THR

THR-OUT



Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
GERMANY
www.gsi.de

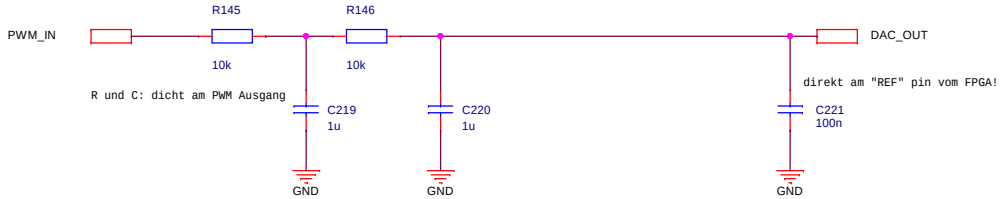
DAC

Design: K:\GSI\JOB\COME_AND_KISS\PANDA-DIRC-WASA\PADIWA-AMPS2\PADIWA-AMPS2.DSN		
Modified: Friday, February 24, 2017	Size: A3	Page: 20/ 27
Designer: M.Traxler	Layouter: H.Kavan	

wire around FPGA, from output side to input side

FPGA-THR

THR-OUT



Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
GERMANY
www.gsi.de

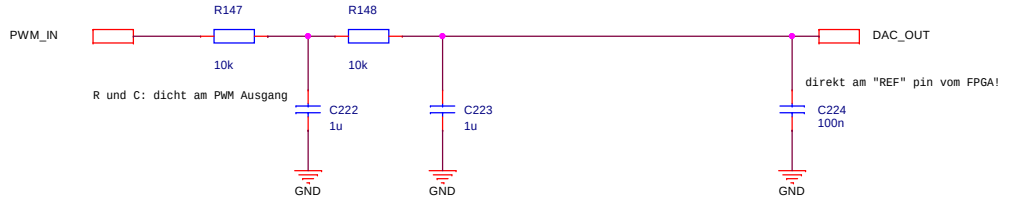
DAC

Design: K:\GSI\JOB\COME_AND_KISS\PANDA-DIRC-WASA\PADIWA-AMPS2\PADIWA-AMPS2.DSN		
Modified: Friday, February 24, 2017	Size: A3	Page: 21/ 27
Designer: M.Traxler	Layouter: H.Kavan	

wire around FPGA, from output side to input side

FPGA-THR

THR-OUT



Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
GERMANY
www.gsi.de

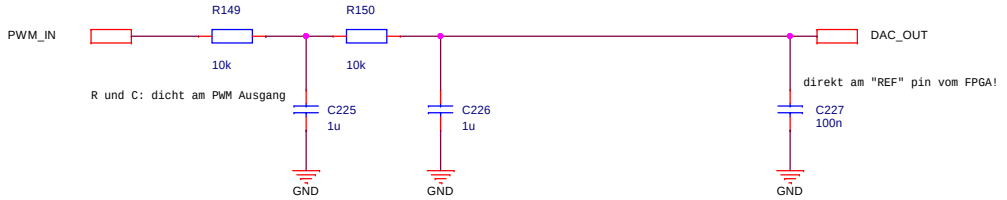
DAC

Design: K:\GSI\JOB\COME_AND_KISS\PANDA-DIRC-WASA\PADIWA-AMPS2\PADIWA-AMPS2.DSN		
Modified: Friday, February 24, 2017	Size: A3	Page: 22/ 27
Designer: M.Traxler	Layouter: H.Kavan	

wire around FPGA, from output side to input side

FPGA-THR

THR-OUT



Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
GERMANY
www.gsi.de

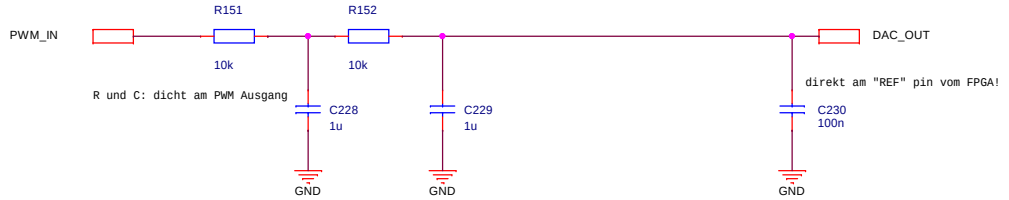
DAC

Design: K:\GSI\JOB\COME_AND_KISS\PANDA-DIRC-WASA\PADIWA-AMPS2\PADIWA-AMPS2.DSN		
Modified: Friday, February 24, 2017	Size: A3	Page: 23/ 27
Designer: M.Traxler	Layouter: H.Kavan	

wire around FPGA, from output side to input side

FPGA-THR

THR-OUT



Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
GERMANY
www.gsi.de

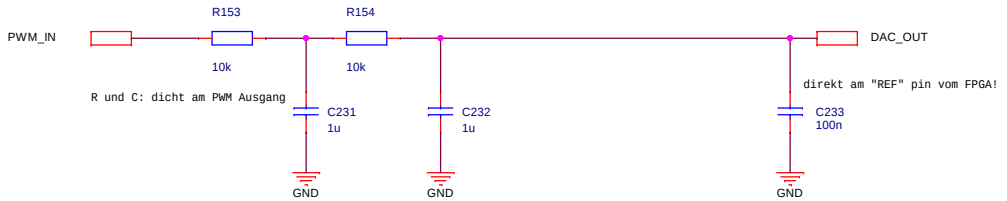
DAC

Design: K:\GSI\JOB\COME_AND_KISS\PANDA-DIRC-WASA\PADIWA-AMPS2\PADIWA-AMPS2.DSN		
Modified: Friday, February 24, 2017	Size: A3	Page: 24/ 27
Designer: M.Traxler	Layouter: H.Kavan	

wire around FPGA, from output side to input side

FPGA-THR

THR-OUT



Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
GERMANY
www.gsi.de

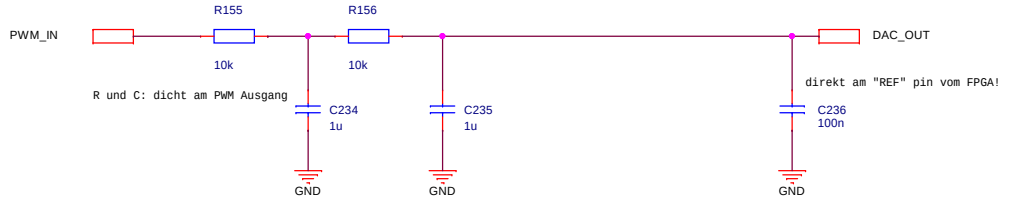
DAC

Design: K:\GSI\JOB\COME_AND_KISS\PANDA-DIRC-WASA\PADIWA-AMPS2\PADIWA-AMPS2.DSN		
Modified: Friday, February 24, 2017	Size: A3	Page: 25/ 27
Designer: M.Traxler	Layouter: H.Kavan	

wire around FPGA, from output side to input side

FPGA-THR

THR-OUT



Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
GERMANY
www.gsi.de

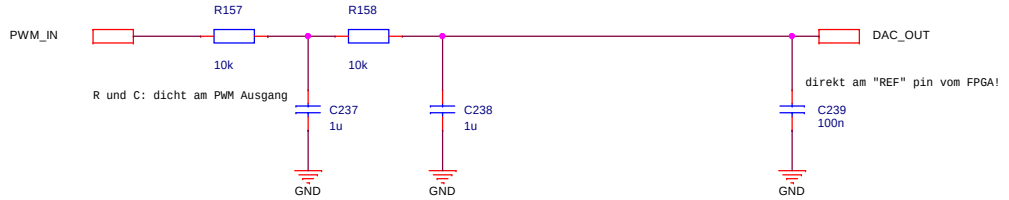
DAC

Design: K:\GSI\JOB\COME_AND_KISS\PANDA-DIRC-WASA\PADIWA-AMPS2\PADIWA-AMPS2.DSN		
Modified: Friday, February 24, 2017	Size: A3	Page: 26/ 27
Designer: M.Traxler	Layouter: H.Kavan	

wire around FPGA, from output side to input side

FPGA-THR

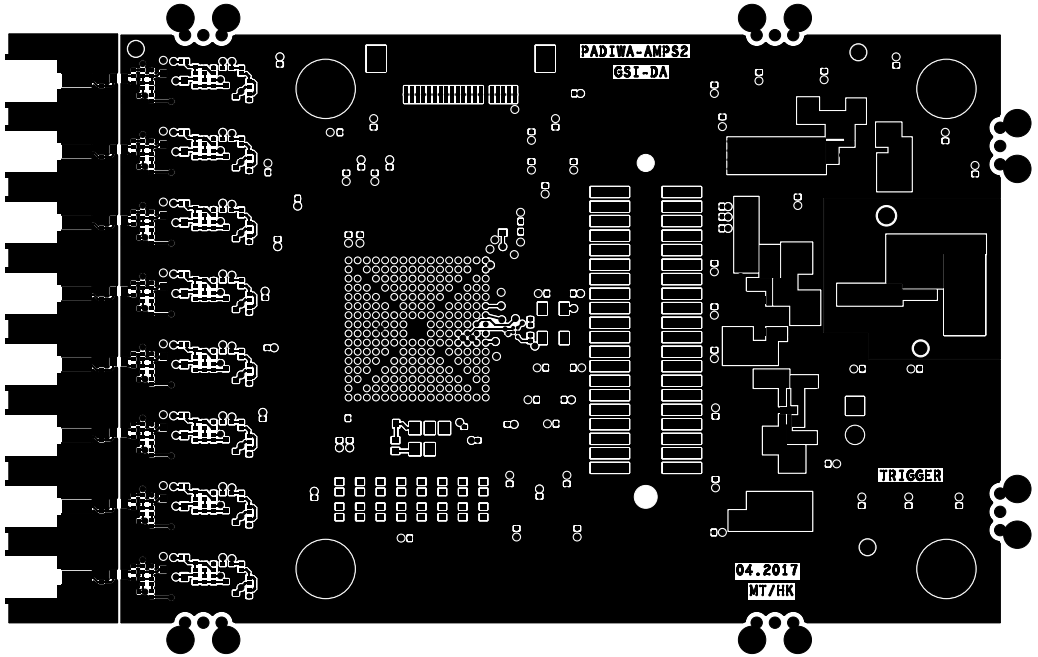
THR-OUT



Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
GERMANY
www.gsi.de

DAC

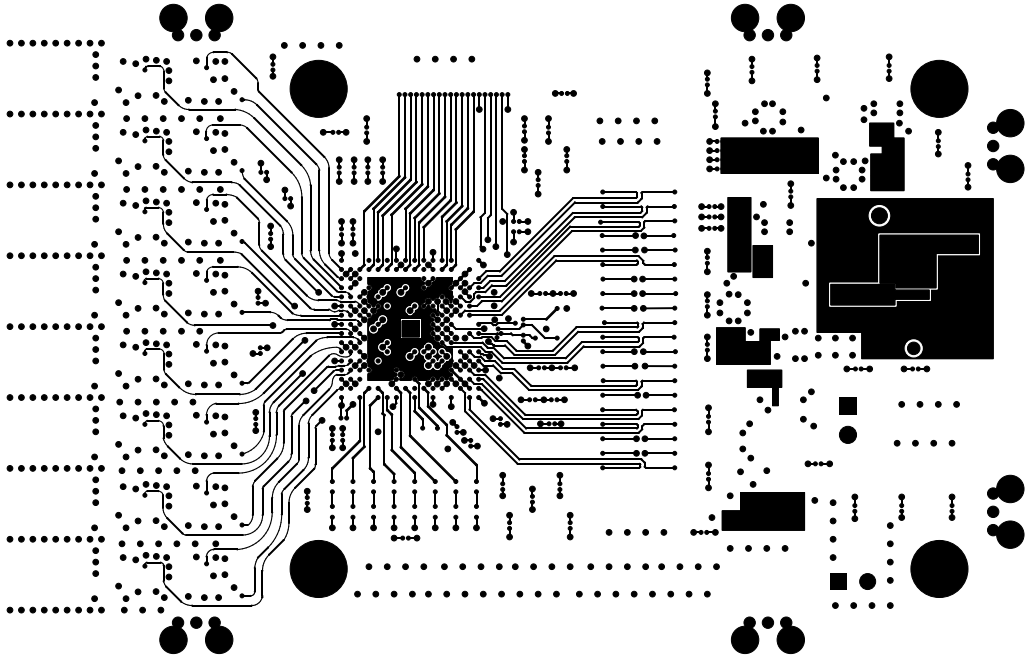
Design: K:\GSI\JOB\COME_AND_KISS\PANDA-DIRC-WASA\PADIWA-AMPS2\PADIWA-AMPS2.DSN		
Modified: Friday, February 24, 2017	Size: A3	Page: 27/ 27
Designer: M.Traxler	Layouter: H.Kavan	



.

Jobname	Date	Designer	Layouter
PADIWA-AMPS2	04.2017	M.Traxler	H.Kayan

Layer Nickname Top / Signal Plane GND_PMT, GND

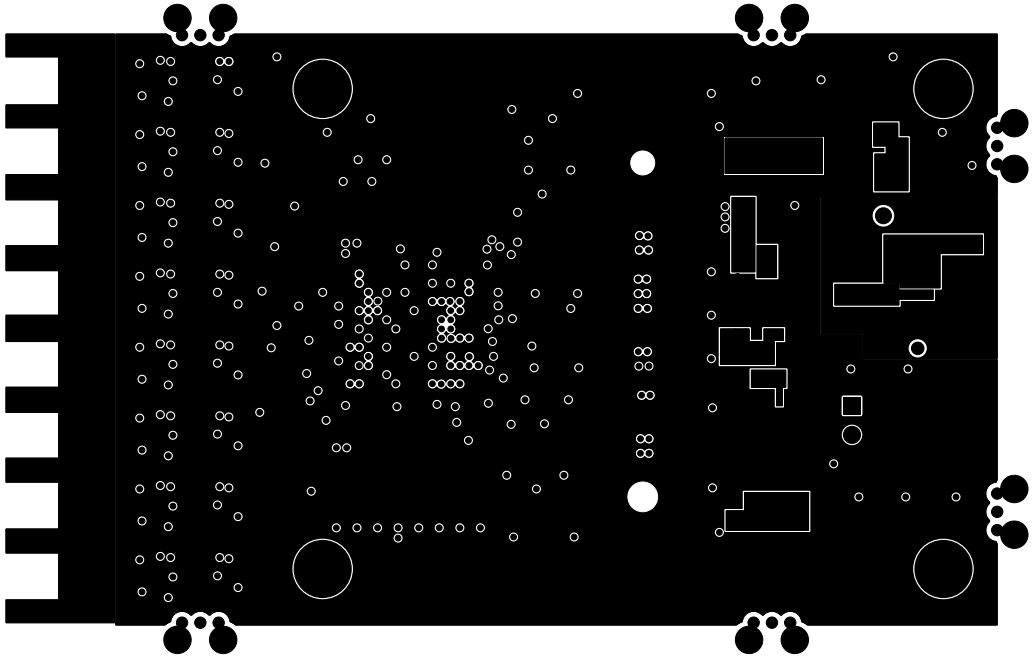


.

Jobname	Date	Designer	Layouter
PADIWA-AMPS2	04.2017	M.Traxler	H.Kayan

Layer Nickname

I01 / Signal 50R SE, 100R DIFF

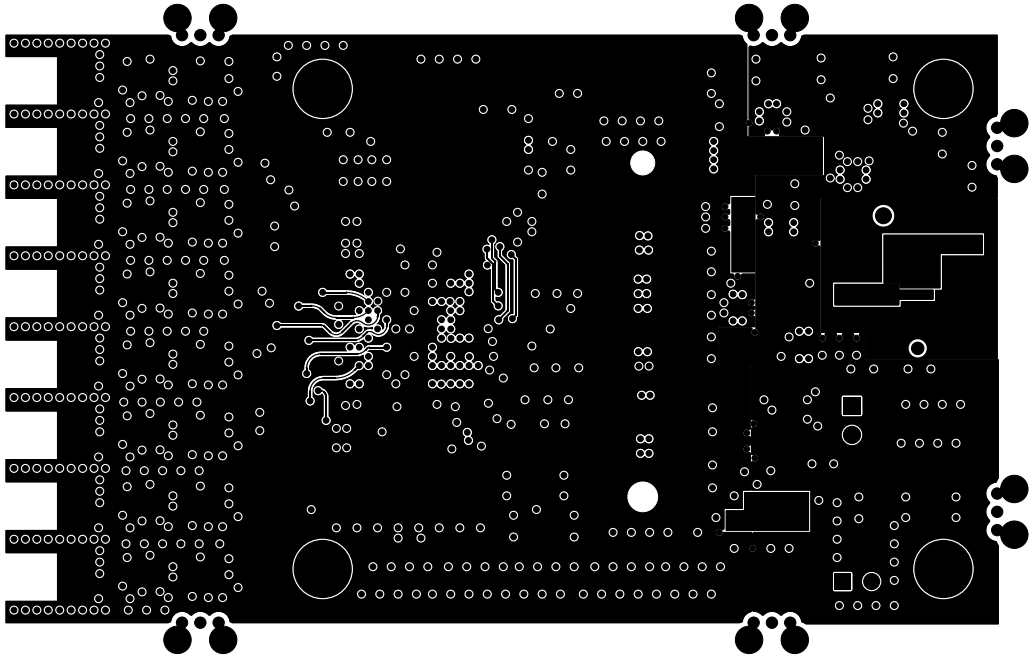


.

Jobname	Date	Designer	Layouter
PADIWA-AMPS2	04.2017	M.Traxler	H.Kayan

Layer Nickname

I02 / Plane GND_PMT, GND

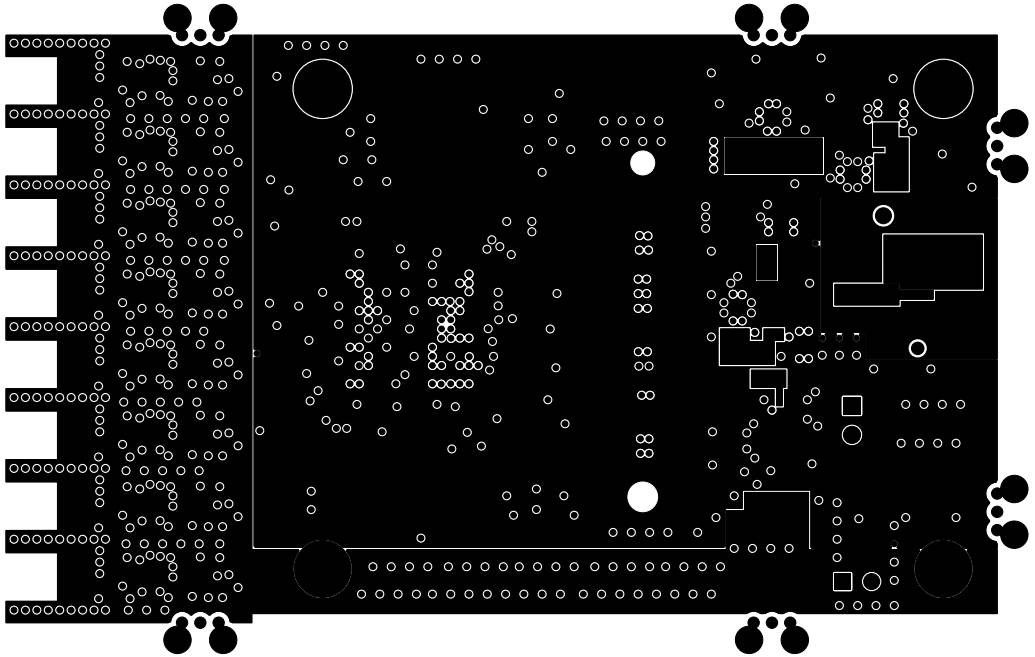


.

Jobname	Date	Designer	Layouter
PADIWA-AMPS2	04.2017	M.Traxler	H.Kayan

Layer Nickname

I03 / Plane V4+, Vin

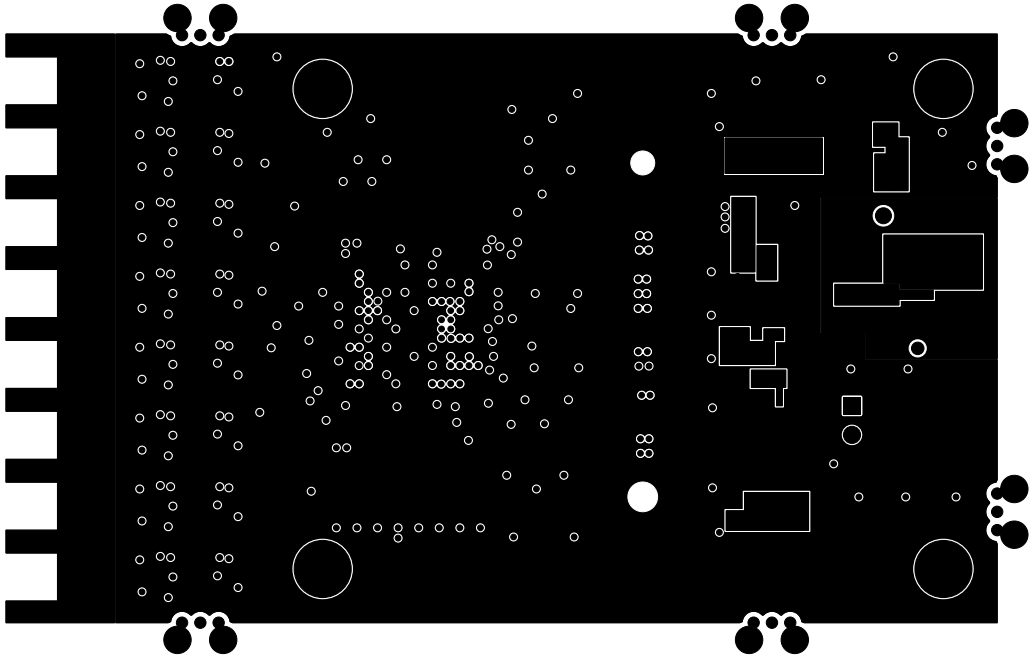


.

Jobname	Date	Designer	Layouter
PADIWA-AMPS2	04.2017	M.Traxler	H.Kayan

Layer Nickname

I10 / Plane Vterm, Vreg

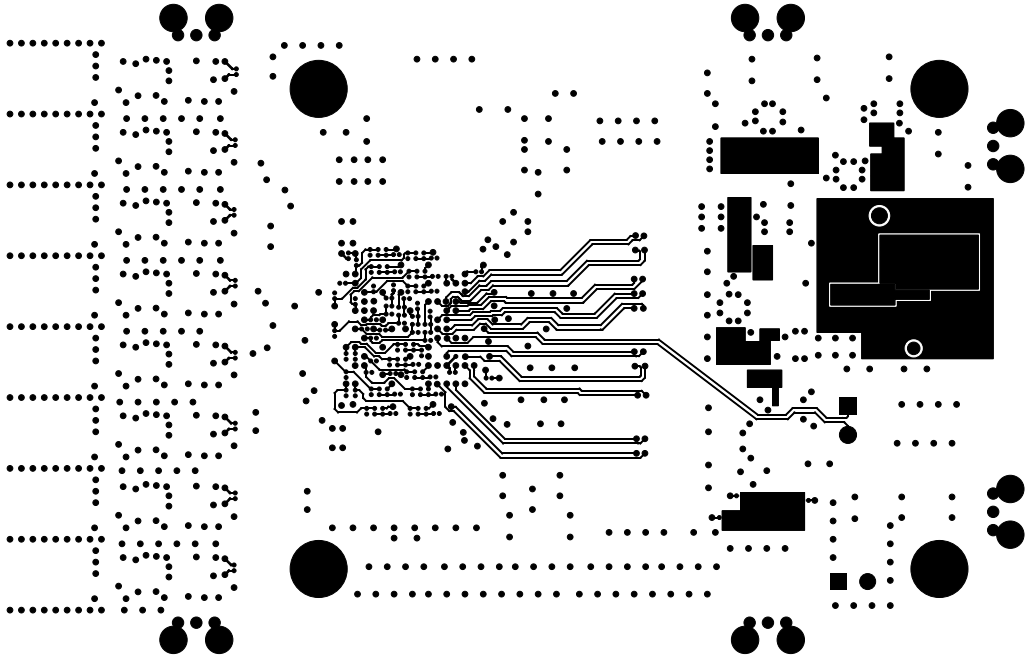


.

Jobname	Date	Designer	Layouter
PADIWA-AMPS2	04.2017	M.Traxler	H.Kayan

Layer Nickname

I11 / Plane GND_PMT/GND

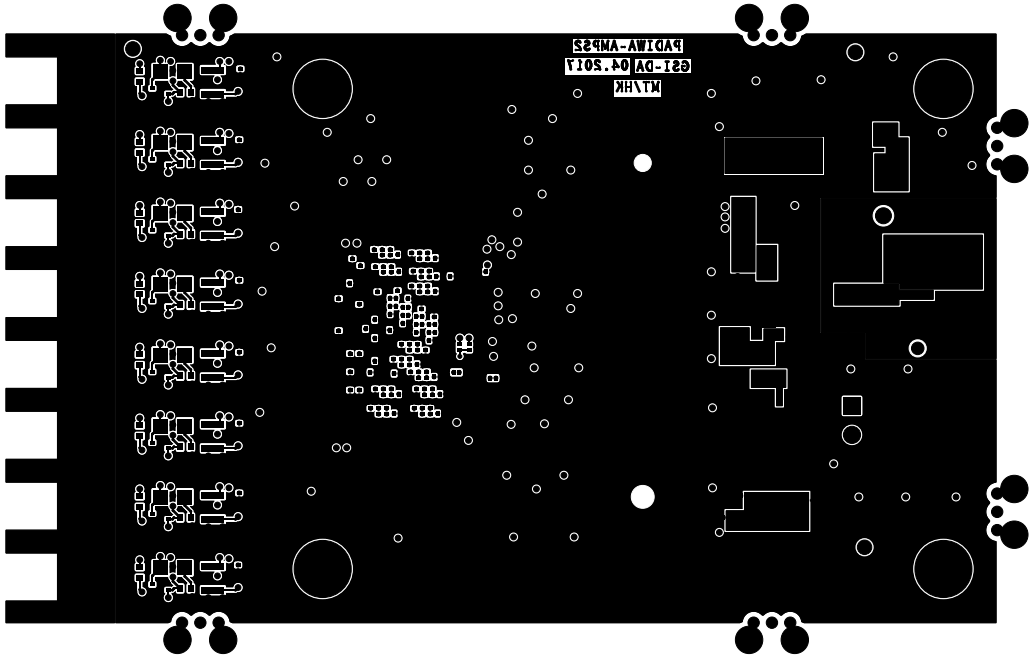


.

Jobname	Date	Designer	Layouter
PADIWA-AMPS2	04.2017	M.Traxler	H.Kayan

Layer Nickname

I12 / Signal 50R SE, 100R DIFF

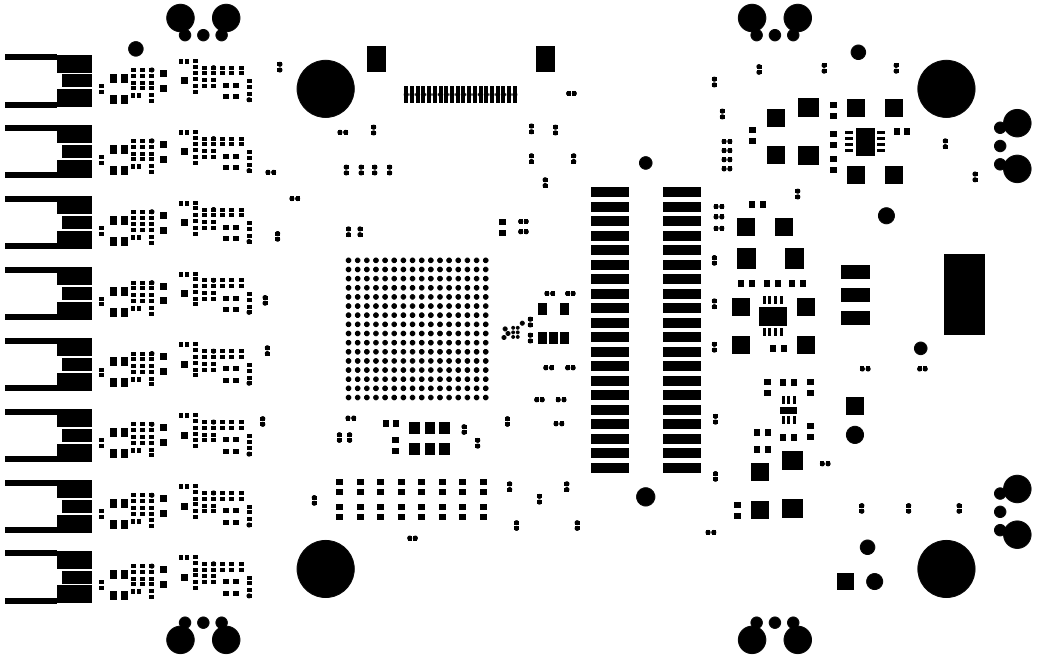


.

Jobname	Date	Designer	Layouter
PADIWA-AMPS2	04.2017	M.Traxler	H.Kayan

Layer Nickname

Bot / Signal Plane GND_PMT, GND

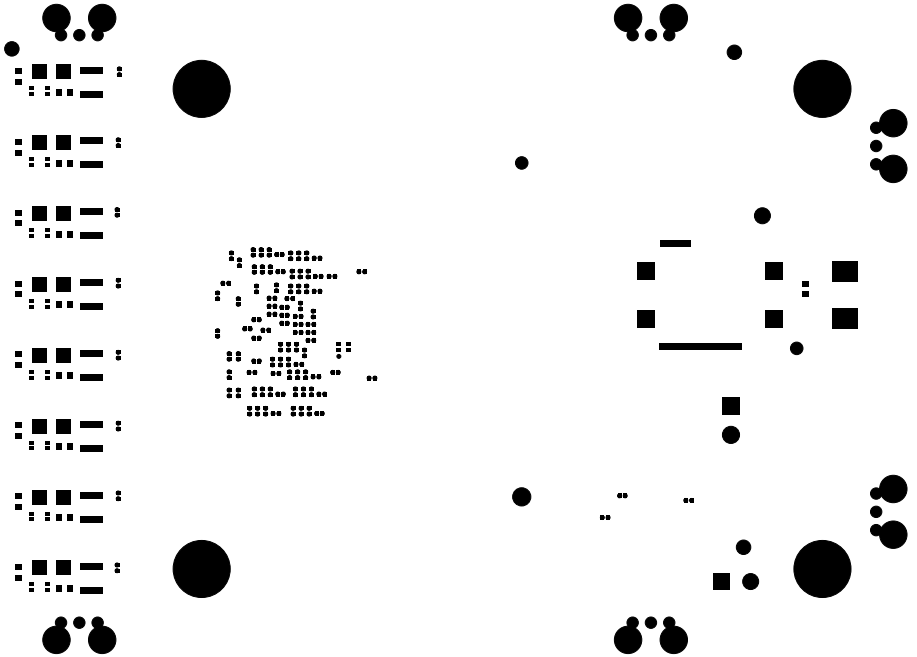


.

Jobname	Date	Designer	Layouter
PADIWA-AMPS2	04.2017	M.Traxler	H.Kayan

Layer Nickname

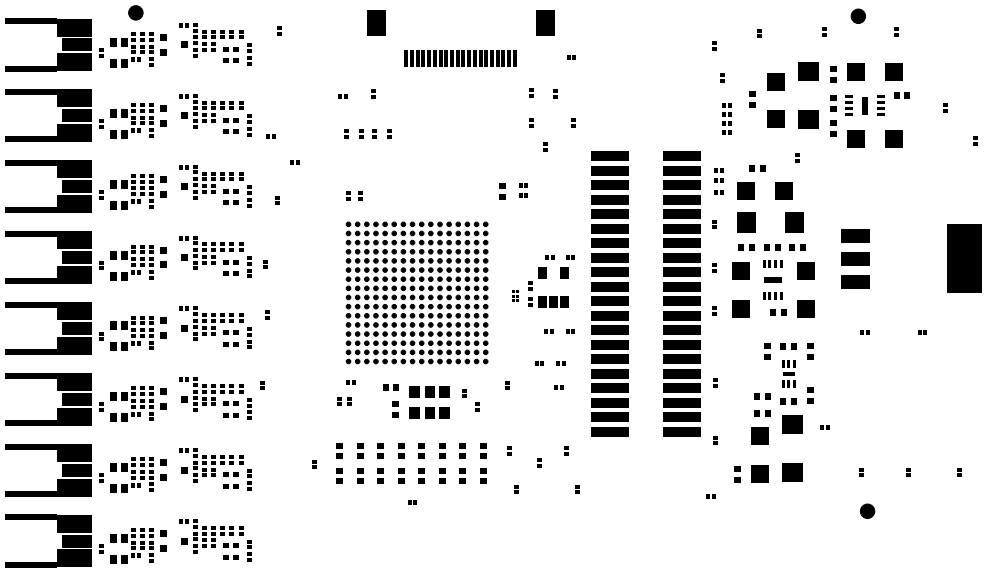
Smt



Jobname	Date	Designer	Layouter
PADIWA-AMPS2	04.2017	M.Traxler	H.Kayan

Layer Nickname

Smb

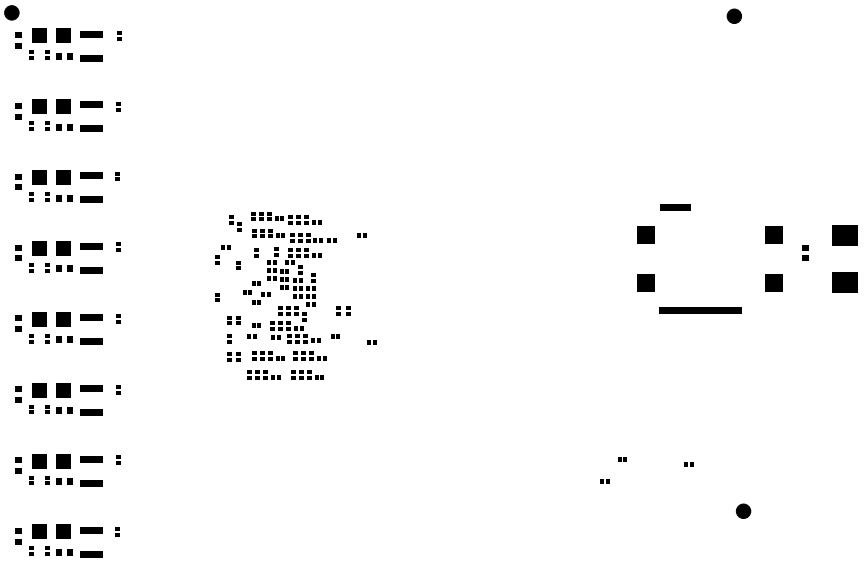


.

Jobname	Date	Designer	Layouter
PADIWA-AMPS2	04.2017	M.Traxler	H.Kayan

Layer Nickname

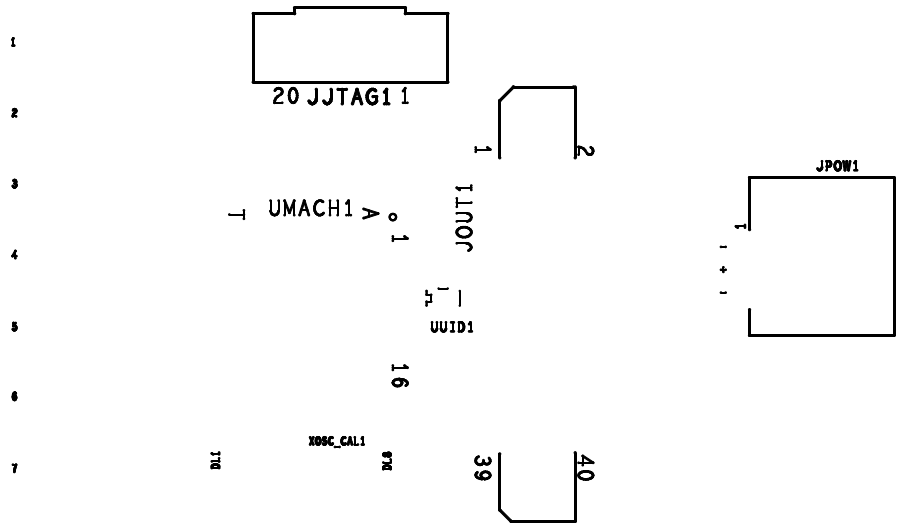
Spt



Jobname	Date	Designer	Layouter
PADIWA-AMPS2	04.2017	M.Traxler	H.Kayan

Layer Nickname

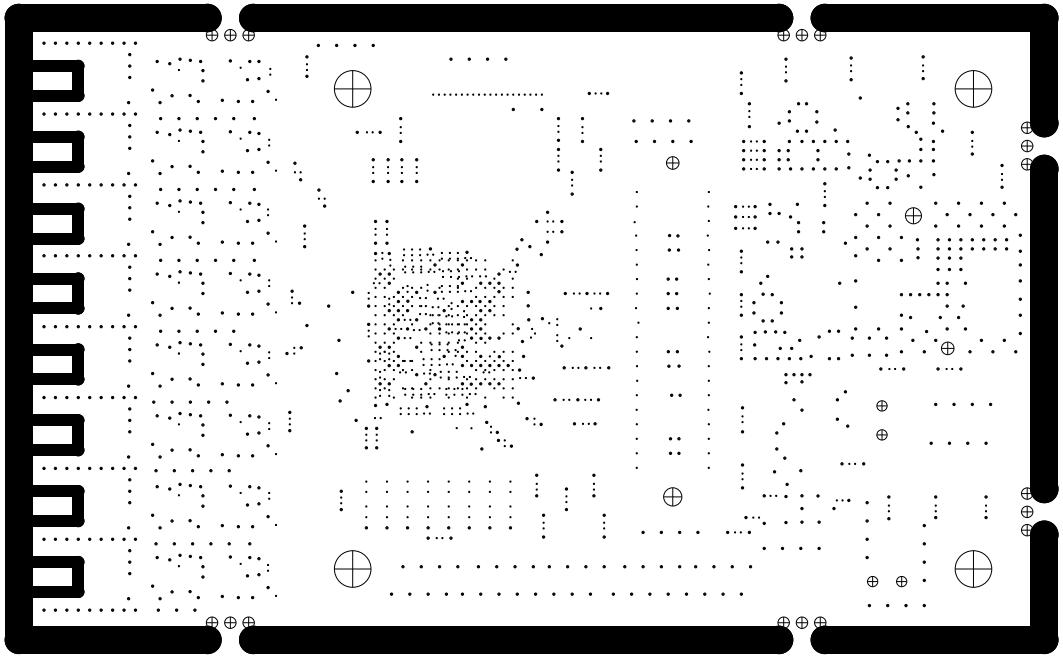
Spb

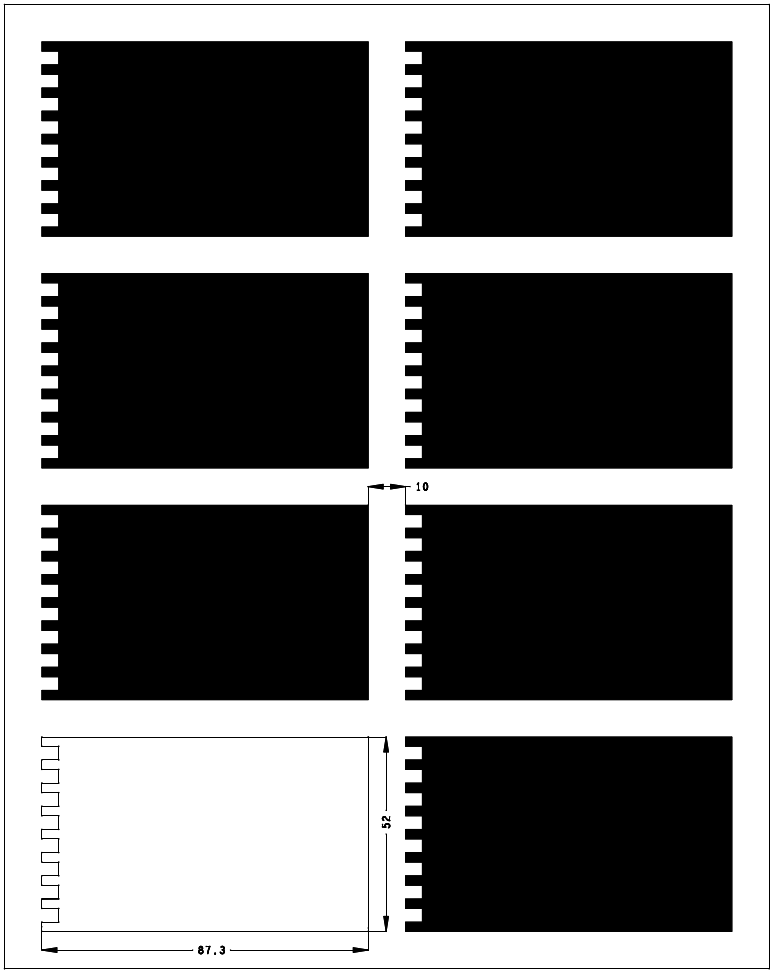


Jobname	Date	Designer	Layouter
PADIWA-AMPS2	04.2017	M.Traxler	H.Kayan

Layer Nickname

Sst

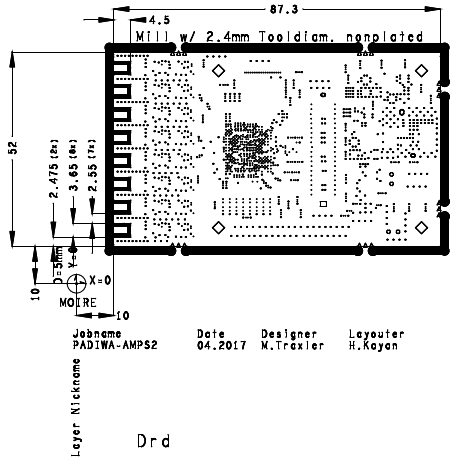




Jobname	Date	Designer	Layouter
PADIWA-AMPS2	04.2017	M.Traxler	H.Kayan

Layer Nickname

Fab

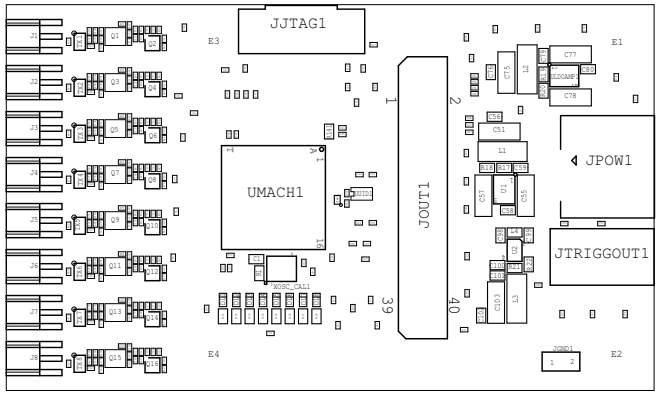


DRILL CHART: TOP to BOTTOM			
ALL UNITS ARE IN MILLIMETERS			
FIGURE	SIZE	PLATED	QTY
·	0.2	PLATED	798
·	0.4	PLATED	1
○	0.9	PLATED	4
◇	3.2	PLATED	4
△	1.0	NON-PLATED	18
○	1.1	NON-PLATED	2
○	1.4	NON-PLATED	1
□	1.6	NON-PLATED	1
○	2.4	NON-PLATED	12
		TOTAL HOLES:	841

DRILL CHART: TOP to INNER1			
ALL UNITS ARE IN MILLIMETERS			
FIGURE	SIZE	PLATED	QTY
·	0.1	PLATED	455
		TOTAL HOLES:	455

DRILL CHART: INNER1 to INNER12			
ALL UNITS ARE IN MILLIMETERS			
FIGURE	SIZE	PLATED	QTY
·	0.2	PLATED	116
		TOTAL HOLES:	116

DRILL CHART: INNER12 to BOTTOM			
ALL UNITS ARE IN MILLIMETERS			
FIGURE	SIZE	PLATED	QTY
·	0.1	PLATED	197
		TOTAL HOLES:	197



Jobname	Date	Designer	Layouter
PADIWA-AMPS2	04.2017	M.Traxler	H.Kayan

Layer Nickname

Ast

Jobname PADIWA-AMPS2

Date 04.2017

Designer M.Traxler

Layouter H.Kayan

Asb

Layer Nickname

Capture CIS Standard Bill Of Materials - Compressed Report

Report Created on Tuesday Apr 25 09:46:39 2017

Layouter = H.Kayan

Designer = M.Traxler

Item Number	Quantity	Part Referenc	DESCRIPTION	PART_CASE	Value	MANUFACTUI	MANUFACTUI	DATASHEET	COMMISSION	APPROVED	COMPONENT_ID
1	11	C1,C56,C58,C5	Capacitor, Cer	SMD-0402	100n				G.May	G.May	24583
2	41	C2-C13,C30-C	Capacitor, Cer	SMD-0201	100n	GMD033R60J	Murata	K:\GsiLib\Data	M.Traxler	P.Skott	25981
3	20	C14-C20,C41,(	Capacitor, Cer	SMD-0201	68n	GRM033R60J	Murata	K:\GsiLib\Data	M.Traxler	H.Kayan	26140
4	16	C21-C27,C68-(	Capacitor, Cer	SMD-0201	33n	GRM033R60J	Murata	K:\GsiLib\Data	M.Traxler	P.Skott	26067
5	17	C28,C29,C72-(	Capacitor, Cer	SMD-0201	10n	GRM033R70J	Murata	K:\GsiLib\Data	M.Traxler	P.Skott	25982
6	7	C51,C55,C57,(	Capacitor, Cer	SMD-1206	100u	GRM31CR60J	Murata	K:\GsiLib\Data	M.Traxler	P.Skott	25187
7	1	C101	Capacitor, Cer	SMD-0402	4.7u	C1005X5R0J4	TDK	K:\GsiLib\Data	M.Traxler	P.Skott	25745
8	64	C104,C106-C1	Capacitor, Cer	SMD-0201	220n	GRM033R61A	Murata	K:\GsiLib\Data	M.Traxler	H.Kayan	26094
9	24	C105,C116,C1	Capacitor, Cer	SMD-0201	100n	GRM033R61A	Murata	K:\GsiLib\Data	M.Traxler	P.Skott	26069
10	8	C110,C121,C1	Capacitor, Cer	SMD-0201	8.2p	GJM0335C1E8	Murata	K:\GsiLib\Data	M.Traxler	H.Kayan	26093
11	32	C192,C193,C1	Capacitor, Cer	SMD-0201	1u	GRM033R60J	Murata	K:\GsiLib\Data	M.Traxler	P.Skott	25987
12	1	D1	Diode, Zener,	DO-214AA	SMBJ5339B-T	SMBJ5339B-T	Micro Comme	K:\GsiLib\Data	M.Traxler	S.Voltz	25682
13	8	DL1-DL8	LED, Single, G	SMD-0402	SML-P11MT	SML-P11MT	Rohm	K:\GsiLib\Data	M.Traxler	P.Skott	25441
14	4	E1-E4	Connector, Dr		3.2mm	Do not order	None		P.Wieczorek	G.May	24737
15	1	F1	Fuse, SMD, Fa	SMD-0402	2A	0402SFF200F/	Tyco	K:\GsiLib\Data	J.Hoffmann	S.Voltz	25103
16	8	J1-J8	Connector, Ja		0734150961	734150961	Molex	K:\GsiLib\Data	M.Traxler	H.Kayan	26121
17	1	JGND1	Connector, Pi		5-826629-0	5-826629-0	AMP	K:\GsiLib\Data	H.Klingbeil	G.May	22988
18	1	JJTAG1	Connector, So		sd-52892	52892-2096	Molex	K:\GsiLib\Data	M.Traxler	P.Skott	25990
19	1	JOUT1	Connector, Pi		8930E-040-17	8930E-040-17	KEL	K:\GsiLib\Data	M.Traxler	S.Voltz	25633
20	1	JPOW1	Connector, So		37203-1AE0-0	37203-1AE0-0	3M	K:\GsiLib\Data	J.Hoffmann	S.Voltz	25193
21	1	JTRIGGOUT1	Connector, Pi		5-104935-5	5-104935-5	Tyco	K:\GsiLib\Data	M.Traxler	P.Skott	24537
22	3	L1-L3	Inductor, RF-C	SMD-1806	BLM41PG471	BLM41PG471	Murata	K:\GsiLib\Data	M.Traxler	S.Voltz	24601
23	17	L4,L6,L8,L10,L	Inductor, RF-C	SMD-0402	BLM15HG102	BLM15HG102	Murata	K:\GsiLib\Data	K.Koch	S.Voltz	24974
24	8	L5,L9,L13,L17,	Inductor, Fixe	SMD-2012	68uH	CB2012T680K	Taiyo Yuden	K:\GsiLib\Data	M.Traxler	H.Kayan	26125
25	8	L7,L11,L15,L1	Inductor, Pow		330uH	CBC2518T331	Taiyo Yuden	K:\GsiLib\Data	M.Traxler	P.Skott	25737
26	8	Q1,Q3,Q5,Q7,	Transistor, NP	SOT-323	BFS520	BFS520	NXP	K:\GsiLib\Data	M.Traxler	P.Skott	25738
27	8	Q2,Q4,Q6,Q8,	Transistor, NP	TSFP-4	BFP740FE632	BFP740FE632	Infineon	K:\GsiLib\Data	M.Traxler	P.Skott	25541
28	4	R1,R17,R19,R	Resistor, Thick	SMD-0402	10k	RC1005F103C	Samsung		G.May	G.May	21248
29	44	R5,R7-R9,R33,	Resistor, Thick	SMD-0201	10k	RC0201JR-071	Yageo	K:\GsiLib\Data	M.Traxler	P.Skott	25988

30	1	R18	Resistor, Thick	SMD-0402	5.6k				G.May	G.May	22837
31	1	R20	Resistor, Thick	SMD-0402	4.3k				G.May	G.May	22834
32	1	R21	Resistor, Thick	SMD-0402	62k				G.May	G.May	22856
33	8	R23,R36,R49,I	Resistor, Thick	SMD-0201	200k	RC0201FR-07	Yageo	K:\GsiLib\Data	M.Traxler	H.Kayan	26104
34	16	R24,R30,R37,I	Resistor, Thick	SMD-0201	220R	RC0201FR-07	Yageo	K:\GsiLib\Data	M.Traxler	H.Kayan	26095
35	16	R25,R34,R38,I	Resistor, Thick	SMD-0201	12k	RC0201FR-07	Yageo	K:\GsiLib\Data	M.Traxler	H.Kayan	26102
36	8	R26,R39,R52,I	Resistor, Thick	SMD-0201	1k	RC0201FR-07	Yageo	K:\GsiLib\Data	M.Traxler	H.Kayan	26100
37	8	R27,R40,R53,I	Resistor, Thick	SMD-0201	3k	RC0201FR-07	Yageo	K:\GsiLib\Data	M.Traxler	H.Kayan	26101
38	8	R28,R41,R54,I	Resistor, Thick	SMD-0201	300R	RC0201FR-07	Yageo	K:\GsiLib\Data	M.Traxler	H.Kayan	26098
39	8	R29,R42,R55,I	Resistor, Thick	SMD-0201	750R	RC0201JR-07	Yageo	K:\GsiLib\Data	M.Traxler	H.Kayan	26099
40	8	R31,R44,R57,I	Resistor, Thick	SMD-0201	62k	RC0201FR-07	Yageo	K:\GsiLib\Data	M.Traxler	H.Kayan	26103
41	8	R32,R45,R58,I	Resistor, Thick	SMD-0201	56R	RC0201FR-07	Yageo	K:\GsiLib\Data	M.Traxler	H.Kayan	26096
42	8	R35,R48,R61,I	Resistor, Thick	SMD-0201	82R	RC0201FR-07	Yageo	K:\GsiLib\Data	M.Traxler	H.Kayan	26123
43	1	R141	Resistor, Thick	SMD-0402	4.7k				G.May	G.May	22835
44	2	R159,R160	Resistor, Thick	SMD-0201	2k	RC0201FR-07	Yageo	K:\GsiLib\Data	M.Traxler	H.Kayan	26131
45	8	R161-R168	Resistor, Thick	SMD-0402	1.47k				G.May	G.May	21169
46	8	TX1-TX8	Inductor, Tran		PFD2015-103I	PFD2015-103I	Coilcraft	K:\GsiLib\Data	M.Traxler	H.Kayan	26137
47	2	U1,ULDOAMP	IC-Power, Volt	DFN-8	LT1965EDD	LT1965EDD	Linear Techno	K:\GsiLib\Data	M.Traxler	P.Skott	25026
48	1	U2	IC-Power, Volt	DFN-6	LTC3025IDC-1	LTC3025IDC-1	Linear Techno	K:\GsiLib\Data	M.Traxler	P.Skott	24929
49	1	UFILT1	Inductor, RF-C		BNX029-01L	BNX029H01L	Murata	K:\GsiLib\Data	M.Traxler	H.Kayan	26139
50	1	UMACH1	IC-Digital, FPG	caBGA-256	LCMXO3LF-69	LCMXO3LF-69	Lattice	K:\GsiLib\Data	M.Traxler	G.May	25962
51	1	UTMP1	IC-Digital, Cloc	DSBGA-6	TMP108	TMP108AIYFF	Texas Instrum	K:\GsiLib\Data	M.Traxler	H.Kayan	26113
52	1	UUID1	IC-Digital, Mer	SOT-23-5	24AA02UID	24AA02UIDT-I	Microchip	K:\GsiLib\Data	M.Traxler	H.Kayan	26114
53	1	XOSC_CAL1	Crystal, Oscilla		SG3225VAN	SG3225VAN#	Epson	K:\GsiLib\Data	M.Traxler	P.Skott	25976