



DESIGNATOR	PARTNUMBER	PARTNAME
-		
-	<u>A25TD14b-Hxx</u>	<u>A25TD14b-H03</u>
C1	270p100VNP05%5	270p 100V
C2	10u50V	10u 50V
C3	1n200VNP05%5	1n 200V
C4	4n7250VMMK5	4n7 250V
C5	470n250VMMK15	470n 250V
C6	330n250VMMK15	330n 250V
C7	1n200VNP05%5	1n 200V
C8	4n7250VMMK5	4n7 250V
C9	470n250VMMK15	470n 250V
C10	330n250VMMK15	330n 250V
C11	10u50V	10u 50V
C12	270p100VNP05%5	270p 100V
C13	470p200VNP05%5	470p 200V
C14	3n3250VMMK5	3n3 250V
C15	100n63VMMK5	100n 63V
C16	470u40V10x30A	470u 40V A
C17	3u3160VMKP27.5B	3u3 160V
C18	3u3160VMKP27.5B	3u3 160V
C19	470u40V10x30A	470u 40V A
C20	100n63VMMK5	100n 63V
C21	3n3250VMMK5	3n3 250V
C22	470p200VNP05%5	470p 200V
C23	100p200VNP05%5	100p 200V
C24	10p200VNP05%5	10p 200V
C25	47u35V	47u 35V
C26	330n250VMMK15	330n 250V
C27	47u35V	47u 35V
C28	47u35V	47u 35V
C29	330n250VMMK15	330n 250V
C30	47u35V	47u 35V
C31	100p200VNP05%5	100p 200V
C32	10p200VNP05%5	10p 200V
C33	see below	100n63VMMK5
C34	4n7250VMMK5	4n7 250V
C35	22n250VMMK10	22n 250v
C36	33u50V	33u 50V
C37	33u50V	33u 50V
C38	33u50V	33u 50V
C39	33u50V	33u 50V
C40	1n5250VMMK5	1n5 250V
C41	1n200VNP05%5	1n 200V
C42	1n200VNP05%5	1n 200V
C43	330p200VNP05%5	330p200VNP05%5
C44	see below	100n63VMMK5
C45	see below	100n63VMMK5
C46	see below	100n63VMMK5
D3	15V1.3W5%	15V 1.3W 5%
D4	15V1.3W5%	15V 1.3W 5%
D5	100V1.3W5%	100V 1.3W 5%

D6	100V1.3W5%	100V 1.3W 5%
D7	1N4004	1N4004
D8	1N4004	1N4004
D9	1N4004	1N4004
D10	1N4004	1N4004
D11	100V1.3W5%	100V 1.3W 5%
D12	15V1.3W5%	15V 1.3W 5%
D13	BAV21	BAV21
D14	3V3.4W5%	3V3 .4W 5%
D15	3V3.4W5%	3V3 .4W 5%
D16	BAV21	BAV21
D17	15V1.3W5%	15V 1.3W 5%
D18	100V1.3W5%	100V 1.3W 5%
D19	BYV26C	BYV26C
D20	BAV21	BAV21
D21	BYV26C	BYV26C
D22	BYV26C	BYV26C
D23	9V1.4W5%	9V1 .4W 5%
D24	9V1.4W5%	9V1 .4W 5%
D25	BYV26C	BYV26C
D26	BYV26C	BYV26C
D27	BAV21	BAV21
D28	BYV26C	BYV26C
D29	39V.4W2%	39V .4W 2%
D30	39V.4W2%	39V .4W 2%
D31	10V.4W5%	10V .4W 5%
D32	DB3	DB3
D33	BAV21	BAV21
D34	BAV21	BAV21
D35	15V1.3W5%	15V1.3W5%
D36	see below	BAV21
D37	see below	BAV21
K1	14uHD14-23	14uHD14-23
K2	14uHD14-23	14uHD14-23
P1	FBLPPC5x209M	FBLPPC5x209M
P2	FBLPPC5x209M	FBLPPC5x209M
P4	MH2x41ML	MH2x41ML
Q13	2SJ148	2SJ148
Q14	2SK982	2SK982
Q15	BC559C	BC559C
Q16	BC549C	BC549C
Q17	2SJ148	2SJ148
Q18	2SK982	2SK982
Q19	BC559C	BC559C
Q20	BC549C	BC549C
Q24	BC549C	BC549C
Q25	BC559C	BC559C
Q26	MPSA92	MPSA92
Q27	KSD1691Y	KSD1691Y
Q28	KSD1691Y	KSD1691Y
Q29	BC549C	BC549C
Q30	BC559C	BC559C

Q31	MJE350	MJE350
Q32	MJE340	MJE340
Q33	MPSA42	MPSA42
Q34	BC549C	BC549C
Q35	BC559C	BC559C
Q36	BC549C	BC549C
Q37	BC549C	BC549C
Q38	BC559C	BC559C
Q39	BC559C	BC559C
Q40	Q6015L5	Q6015L5
Q41	BC549C	BC549C
Q42	BC549C	BC549C
R1	R0.8	R0.8
R2	2R2.7W1%	2R2 .7W 1%
R3	3R92W5%	3R9 2W 5%
R4	1R52W5%	1R5 2W 5%
R5	3R92W5%	3R9 2W 5%
R6	1R52W5%	1R5 2W 5%
R7	2R2.7W1%	2R2 .7W 1%
R8	12K2W5%	12K 2W 5%
R9	12K2W5%	12K 2W 5%
R10	39R.7W1%	39R .7W 1%
R11	10K.7W1%	10K .7W 1%
R12	470R.7W1%	470R .7W 1%
R13	3K3.7W1%	3K3 .7W 1%
R14	470R.7W1%	470R .7W 1%
R15	Rxx variant dependent	10R.7W1%
R16	10R.7W1%	10R .7W 1%
R17	Rxx variant dependent	10R.7W1%
R18	4R7.7W1%	4R7 .7W 1%
R19	Rxx variant dependent	R105W2% (5mm stand-off)
R20	R105W2% (5mm stand-off)	R10 5W 2% (5mm stand-off)
R21	Rxx variant dependent	R105W2% (5mm stand-off)
R22	10K.7W1%	10K .7W 1%
R23	10K.7W1%	10K .7W 1%
R24	Rxx variant dependent	R105W2% (5mm stand-off)
R25	R105W2% (5mm stand-off)	R10 5W 2% (5mm stand-off)
R26	Rxx variant dependent	R105W2% (5mm stand-off)
R27	4R7.7W1%	4R7 .7W 1%
R28	536R.7W1%	536R .7W 1%
R29	3K3.7W1%	3K3 .7W 1%
R30	Rxx variant dependent	10R.7W1%
R31	10R.7W1%	10R .7W 1%
R32	Rxx variant dependent	10R.7W1%
R33	10K.7W1%	10K .7W 1%
R34	39R.7W1%	39R .7W 1%
R35	220R.7W1%	220R.7W1%
R36	100R.7W1%	100R .7W 1%
R37	180R.7W1%	180R .7W 1%
R38	200K.7W1%	200K .7W 1%
R39	3K3.7W1%	3K3 .7W 1%
R40	3K3.7W1%	3K3 .7W 1%

R41	200K.7W1%	200K .7W 1%
R42	180R.7W1%	180R .7W 1%
R43	100R.7W1%	100R .7W 1%
R44	220R.7W1%	220R.7W1%
R45	1K.7W1%	1K.7W1%
R46	47K.7W1%	47K .7W 1%
R47	1K4.7W1%	1K4 .7W 1%
R48	82R.7W1%	82R .7W 1%
R49	4K7.7W1%	4K7 .7W 1%
R50	2M.7W1%	2M.7W1%
R51	1M.7W1%	1M .7W 1%
R52	4K7.7W1%	4K7 .7W 1%
R53	82R.7W1%	82R .7W 1%
R54	1K4.7W1%	1K4 .7W 1%
R55	470R.7W1%	470R .7W 1%
R56	3K3.7W1%	3K3 .7W 1%
R57	470R.7W1%	470R .7W 1%
R58	18K2W5% (5mm stand-off)	18K 2W 5% (5mm stand-off)
R59	2R22W5%	2R2 2W 5%
R60	2M.7W1%	2M.7W1%
R61	2R22W5%	2R2 2W 5%
R62	18K2W5% (5mm stand-off)	18K 2W 5% (5mm stand-off)
R63	6K8.7W1%	6K8 .7W 1%
R64	6K8.7W1%	6K8 .7W 1%
R65	47R.7W1%	47R .7W 1%
R66	47R.7W1%	47R .7W 1%
R67	47K.7W1%	47K .7W 1%
R68	294K.7W1%	294K .7W 1%
R69	560K.7W1%	560K.7W1%
R70	560K.7W1%	560K.7W1%
R71	47K.7W1%	47K .7W 1%
R73	294K.7W1%	294K .7W 1%
R74	47K.7W1%	47K .7W 1%
R75	47R.7W1%	47R .7W 1%
R76	47R.7W1%	47R .7W 1%
R77	1K.7W1%	1K .7W 1%
R78	1K4.7W1%	1K4 .7W 1%
R79	23K2.7W1%	23K2 .7W 1%
R80	27K.7W1%	27K .7W 1%
R81	4K7.7W1%	4K7.7W1%
R82	100K.7W1%	100K .7W 1%
R83	10R.7W1%	10R .7W 1%
R84	27K.7W1%	27K .7W 1%
R85	27K.7W1%	27K .7W 1%
R86	100K.7W1%	100K .7W 1%
R87	4K7.7W1%	4K7.7W1%
R88	10K.7W1%	10K .7W 1%
R89	47K.7W1%	47K .7W 1%
R90	6K04.7W1%	6K04 .7W 1%
R91	100K.7W1%	100K .7W 1%
R92	100K.7W1%	100K .7W 1%
R93	18K2W5% (5mm stand-off)	18K2W5% (5mm stand-off)

R97	Rxx.7W1%	42K2.7W1%
R98	Rxx.7W1%	42K2.7W1%
U1	EL817	EL817
U2	EL817	EL817
U3	HCPL2601	HCPL2601
U4	HCPL2601	HCPL2601
VR1	VR220RLY2X3M	VR 220R LY
PCB	A25TD14	A25TD14

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	<b><u>A25TD14b-Mxx</u></b>	<b><u>A25TD14b-M03</u></b>
-	A25TD14b-Hxx	A25TD14b-H03
D1	STTH1506DPI	STTH1506DPI
D2	STTH1506DPI	STTH1506DPI
Q1	2SA1294	2SA1294
Q2	Qxx variant dependent	2SA1294
Q3	2SA1294	2SA1294
Q4	Qxx variant dependent	2SA1294
Q5	STY60NK30Z	STY60NK30Z
Q6	STY60NK30Z	STY60NK30Z
Q7	Qxx variant dependent	2SC3263
Q8	2SC3263	2SC3263
Q9	Qxx variant dependent	2SC3263
Q10	2SC3263	2SC3263
Q11	MJE350	MJE350
Q12	MJE340	MJE340
Q21	MJE350	MJE350
Q22	KSD1691Y	KSD1691Y
Q23	MJE340	MJE340
NTC1	NTC100KPEFILM	NTC100KPEFILM
NTC2	NTC100KPEFILM	NTC100KPEFILM
see instruction	FS15x4x1	FS15x4x1
see instruction	RSI-2642	RSI-2642
see instruction	CLJTNTC	CLJTNTC
see instruction	CLTO247x4	CLTO247x4
see instruction	COCTO247X4TS	COCTO247x4TS
see instruction	COCTO247X4	COCTO247x4
see instruction	COCTO247X4	COCTO247x4
see instruction	MRT103x6	MRT103x6
see instruction	MRT103x12	MRT103x12
see instruction	BRB3.2x8x1	BRB3.2x8x1
see instruction	FBB3.1	FBB3.1
see instruction	M6MM3	M6MM3
see instruction	T3x10_LAB	T3x10_LAB
see instruction	BRV3.2x8x.6	BRV3.2x8x.6
see instruction	ISMI12.5x10d3.1	ISMI12.5x10d3.1
see instruction	ISMI24x17.6	ISMI24x17.6
see instruction	ISSR17x8	ISSR17x8
see instruction	SA25TD14b-Mxx	see instruction
U5	PWMNATD-F01	PWMNATD-F01
U6	PWMPATD-F01	PWMPATD-F01

see instruction      Fxx variant dependent  
see instruction      LSxx variant dependent

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	<b><u>A25TD14b-FXX</u></b>	<b><u>A25TD14b-F05</u></b>
	A25TD14b-MXX	A25TD14b-M03
R21	Rxx variant dependent	see below
R24	Rxx variant dependent	see below
R95	RXX.7W1%	866R.7W1%
R96	RXX.7W1%	866R.7W1%
see instruction	Fxx variant dependent	
see instruction	LSxx variant dependent	
see instruction	LSxx variant dependent	SA25TD14b-F05

[illegible]



[illegible]

[illegible]

[illegible]



see instruction	NO
see instruction	NO

[illegible]







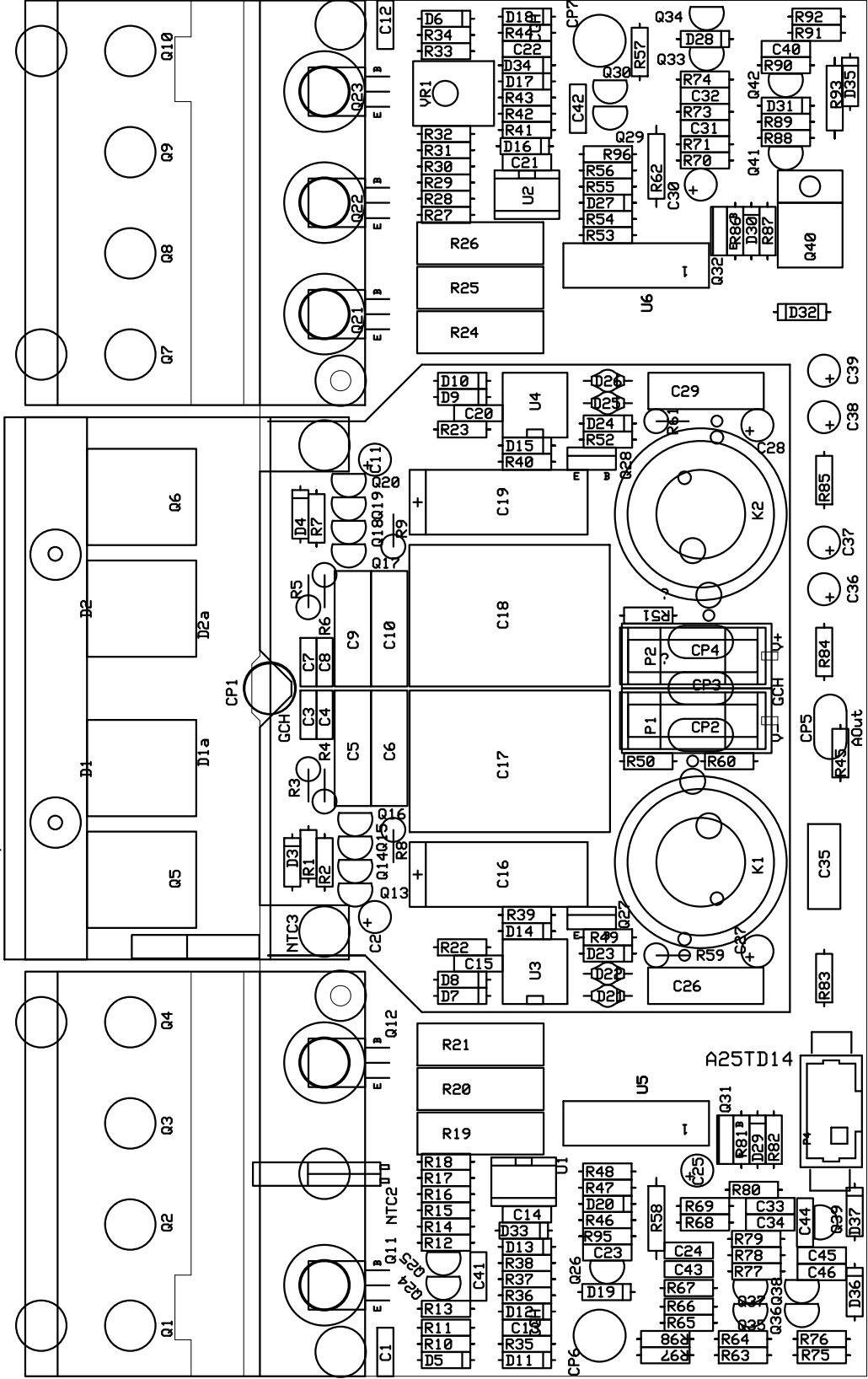




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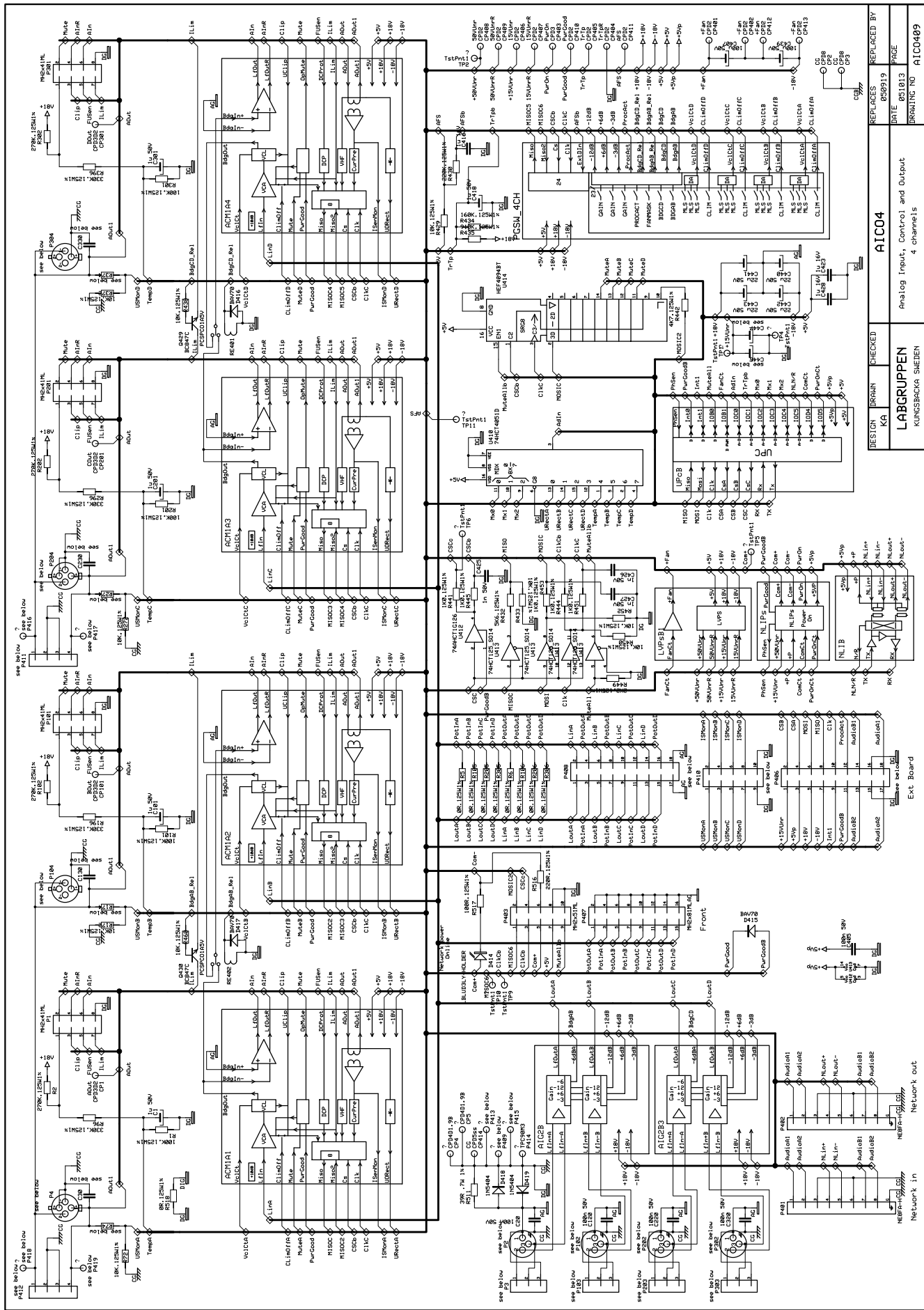
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2 x ho1 unplated d3.2 in boardformat



2 x slot plated 1.3x2.5 in boardformat

DESIGN	DRAWN	CHECKED	A25TD		REPLACES	REPLACED BY
KA	KA/FK				Ø60714	Ø60714
LABGRUPPEN			Amplifier 2.5kw class TD		DATE	PAGE
KUNGSBACKA SWEDEN					Ø61101	
					DRAWING NO	A25TD14



DESIGN	BRANCH	CHECKED	REPLACES	REPLACED BY
KA			AIC04	050919
			Analog Input, Control and Output	DATE 051013
			4 channels	BRONING NO
				AIC0409

DESIGN	BRANCH	CHECKED	REPLACES	REPLACED BY
KA			AIC04	050919
			Analog Input, Control and Output	DATE 051013
			4 channels	BRONING NO
				AIC0409

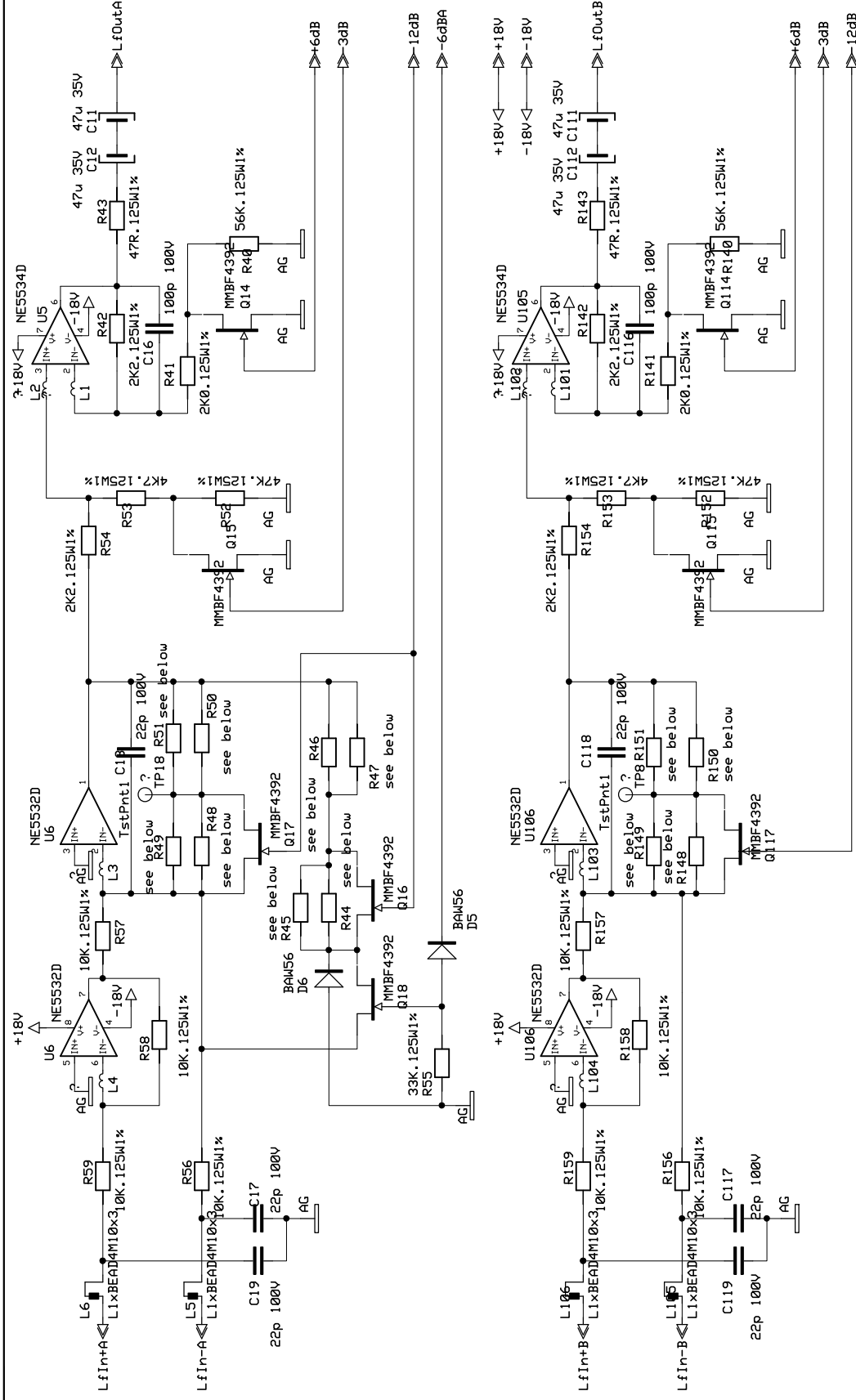






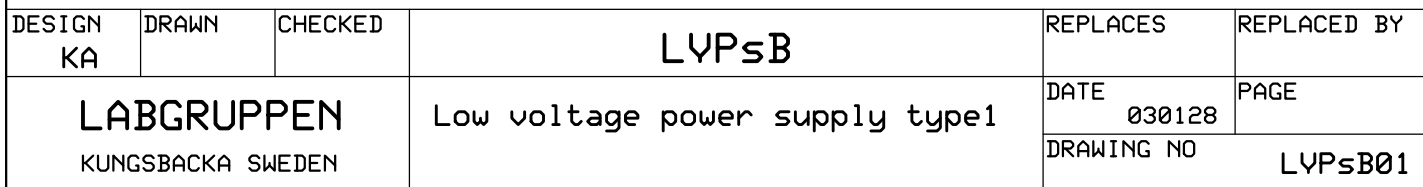




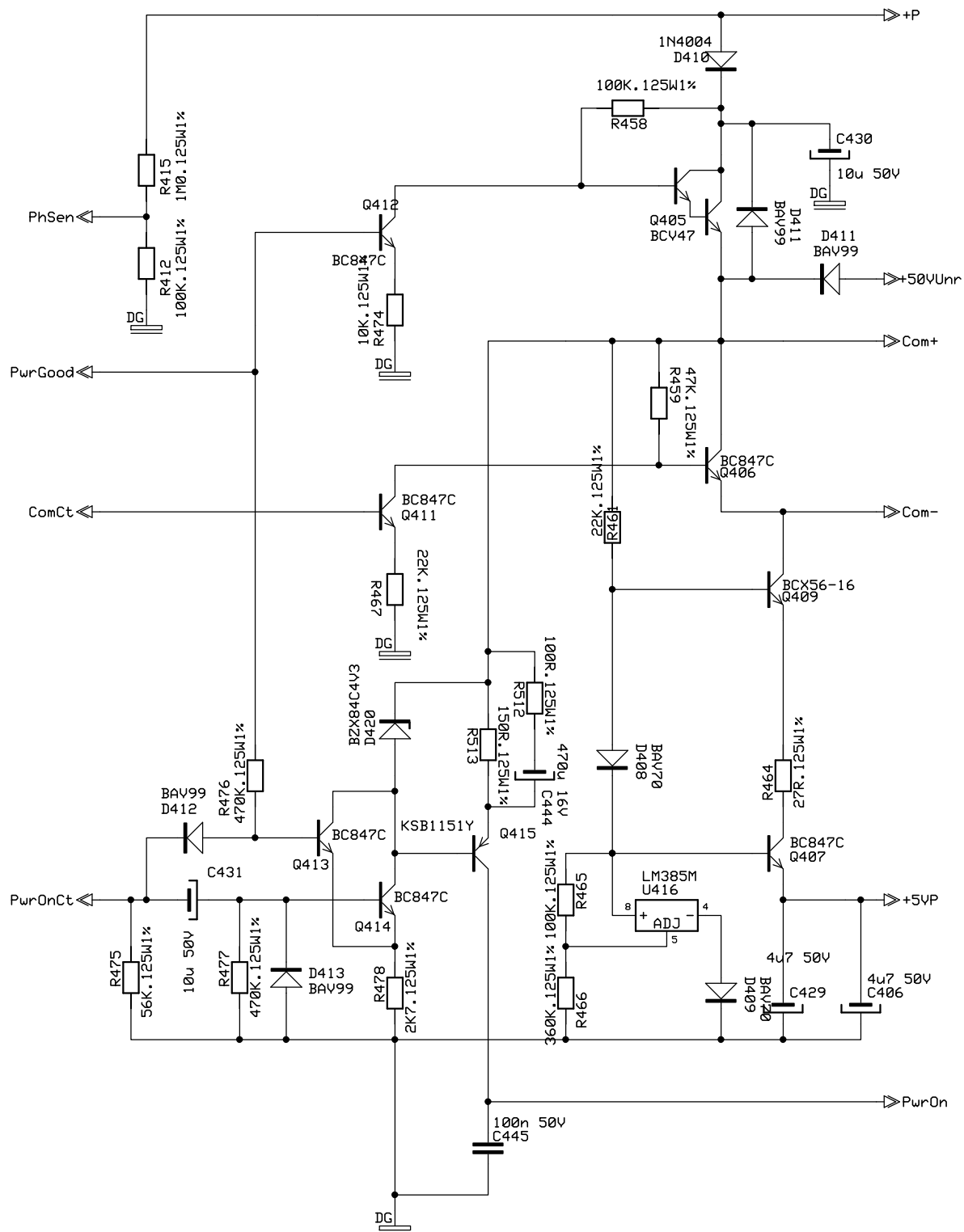


DESIGN	DRAWN	CHECKED	REPLACES	REPLACED BY
<b>LABGRUPPEN</b> KUNGSBACKA SWEDEN			DATE	PAGE
			DRAWING NO	







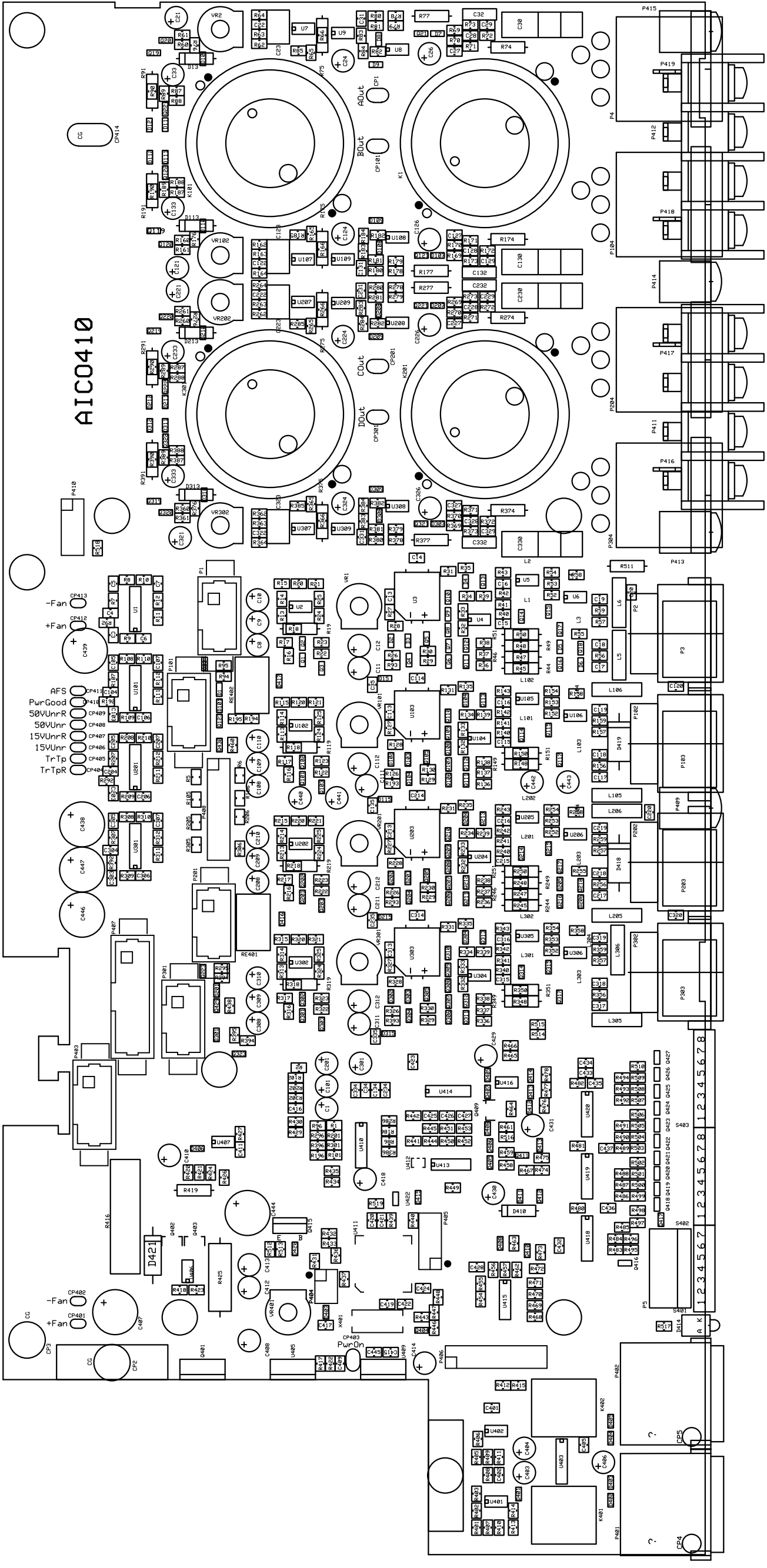


DESIGN KA	DRAWN	CHECKED	NLIPs	REPLACES	REPLACED BY
LABGRUPPEN KUNGSBACKA SWEDEN			Nomad Link Interface Power Supply	DATE 030128	PAGE
				DRAWING NO NLIPs01	











## P-Channel 60-V (D-S) MOSFET

## PRODUCT SUMMARY

Part Number	$V_{(BR)DSS}$ Min (V)	$r_{DS(on)}$ Max ( $\Omega$ )	$V_{GS(th)}$ (V)	$I_D$ (A)
TP0610L	-60	10 @ $V_{GS} = -10$ V	-1 to -2.4	-0.18
TP0610T	-60	10 @ $V_{GS} = -10$ V	-1 to -2.4	-0.12
VP0610L	-60	10 @ $V_{GS} = -10$ V	-1 to -3.5	-0.18
VP0610T	-60	10 @ $V_{GS} = -10$ V	-1 to -3.5	-0.12
BS250	-45	14 @ $V_{GS} = -10$ V	-1 to -3.5	-0.18

## FEATURES

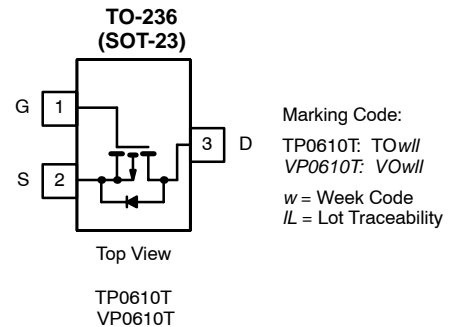
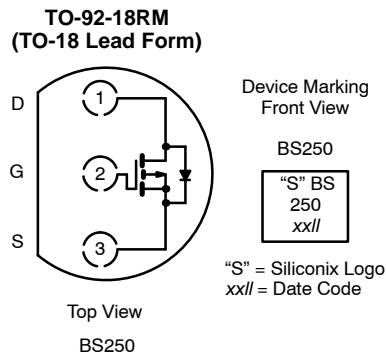
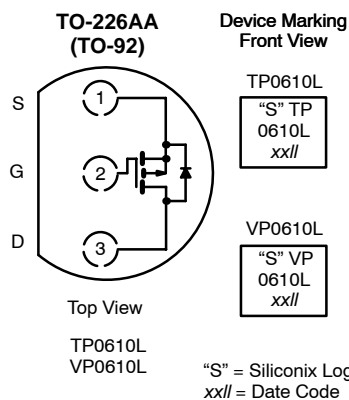
- High-Side Switching
- Low On-Resistance: 8  $\Omega$
- Low Threshold: -1.9 V
- Fast Switching Speed: 16 ns
- Low Input Capacitance: 15 pF

## BENEFITS

- Ease in Driving Switches
- Low Offset (Error) Voltage
- Low-Voltage Operation
- High-Speed Switching
- Easily Driven Without Buffer

## APPLICATIONS

- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.
- Battery Operated Systems
- Power Supply, Converter Circuits
- Motor Control

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$  UNLESS OTHERWISE NOTED)

Parameter	Symbol	TP0610L	TP0610T	VP0610L	VP0610T	BS250	Unit
Drain-Source Voltage	$V_{DS}$	-60	-60	-60	-60	-45	V
Gate-Source Voltage	$V_{GS}$	$\pm 30$	$\pm 30$	$\pm 30$	$\pm 30$	$\pm 25$	
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ )	$I_D$	-0.18	-0.12	-0.18	-0.12	-0.18	A
		-0.11	-0.07	-0.11	-0.07		
Pulsed Drain Current <sup>a</sup>	$I_{DM}$	-0.8	-0.4	-0.8	-0.4		
Power Dissipation	$P_D$	0.8	0.36	0.8	0.36	0.83	W
		0.32	0.14	0.32	0.14		
Thermal Resistance, Junction-to-Ambient	$R_{thJA}$	156	350	156	350	150	$^\circ\text{C/W}$
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 150					$^\circ\text{C}$

Notes

a. Pulse width limited by maximum junction temperature.

For applications information see AN804.

SPECIFICATIONS (T <sub>A</sub> = 25 °C UNLESS OTHERWISE NOTED)										
Parameter	Symbol	Test Conditions	Typ <sup>a</sup>	Limits						Unit
				TP0610L/T		VP0610L/T		BS250		
				Min	Max	Min	Max	Min	Max	
Static										
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = -10 μA	-70	-60		-60				V
		V <sub>GS</sub> = 0 V, I <sub>D</sub> = -100 μA						-45		
Gate-Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -1 mA	-1.9	-1	-2.4	-1	-3.5	-1	-3.5	
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±20 V			±10		±10			nA
		V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±20 V, T <sub>J</sub> = 125°C			±50					
		V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±15 V							±20	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -48 V, V <sub>GS</sub> = 0 V			-1		-1			μA
		V <sub>DS</sub> = -48 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 125°C			-200		-200			
		V <sub>DS</sub> = -25 V, V <sub>GS</sub> = 0 V							-0.5	
On-State Drain Current <sup>b</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> = -10 V, V <sub>GS</sub> = -4.5 V	-180	-50						mA
		V <sub>DS</sub> = -10 V, V <sub>GS</sub> = -10 V	L Suffix	-750			-600			
			T Suffix				-220			
Drain-Source On-Resistance <sup>b</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -25 mA	11		25					Ω
		V <sub>GS</sub> = -10 V, I <sub>D</sub> = -0.5 A	L Suffix	8		10		10		
		V <sub>GS</sub> = -10 V, I <sub>D</sub> = -0.5 A, T <sub>J</sub> = 125°C	L Suffix	15		20		20		
		V <sub>GS</sub> = -10 V, I <sub>D</sub> = -0.2 A	T Suffix	6.5		10		10	14	
Forward Transconductance <sup>b</sup>	g <sub>fs</sub>	V <sub>DS</sub> = -10 V, I <sub>D</sub> = -0.5 A	L Suffix	20	80					mS
		V <sub>DS</sub> = -10 V, I <sub>D</sub> = -0.1 A	T Suffix	90	60		70			
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> = -0.5 A, V <sub>GS</sub> = 0 V	-1.1							V
Dynamic										
Input Capacitance	C <sub>iSS</sub>	V <sub>DS</sub> = -25 V, V <sub>GS</sub> = 0 V f = 1 MHz	15		60		60			pF
Output Capacitance	C <sub>oss</sub>		10		25		25			
Reverse Transfer Capacitance	C <sub>rSS</sub>		3		5		5			
Switching <sup>c</sup>										
Turn-On Time	t <sub>ON</sub>	V <sub>DD</sub> = -25 V, R <sub>L</sub> = 133 Ω I <sub>D</sub> ≅ -0.18 A, V <sub>GEN</sub> = -10 V, R <sub>g</sub> = 25 Ω	8						10	ns
Turn-Off Time	t <sub>OFF</sub>		8						10	

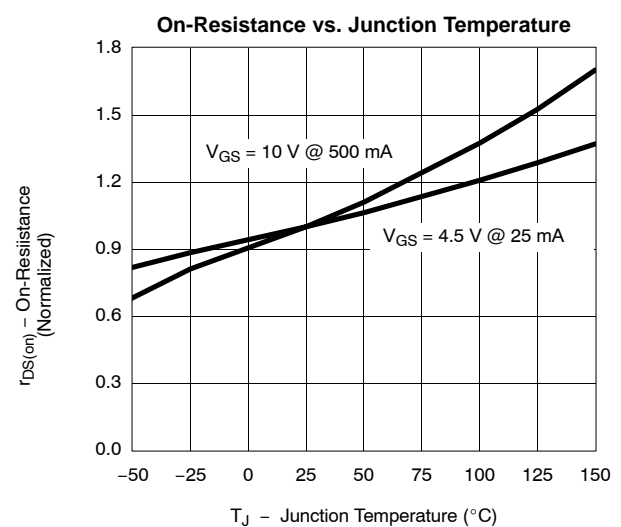
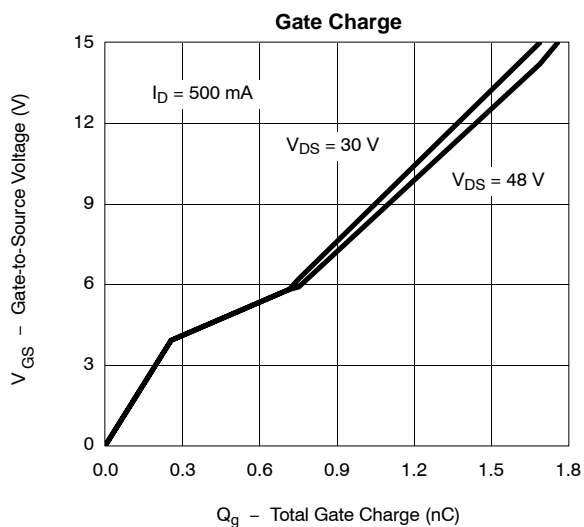
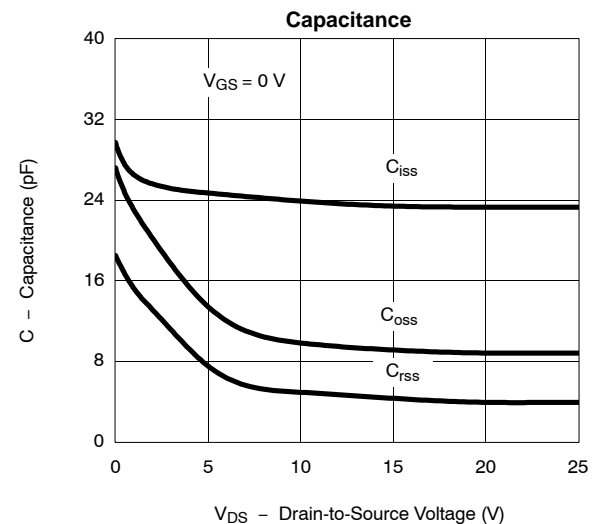
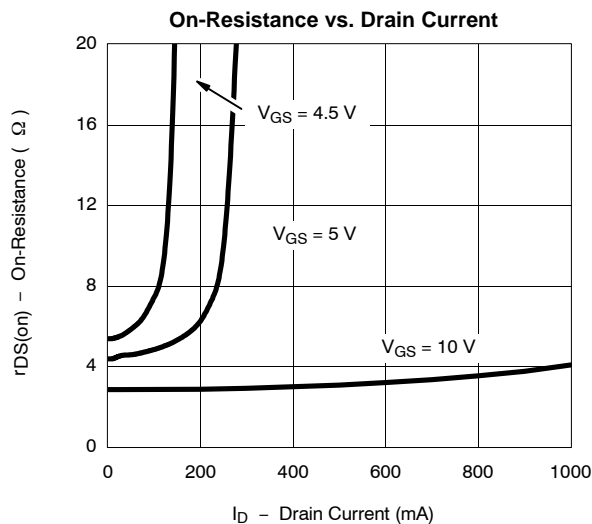
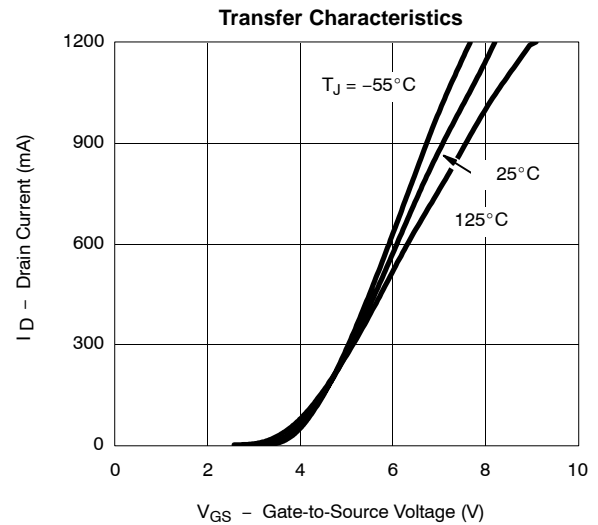
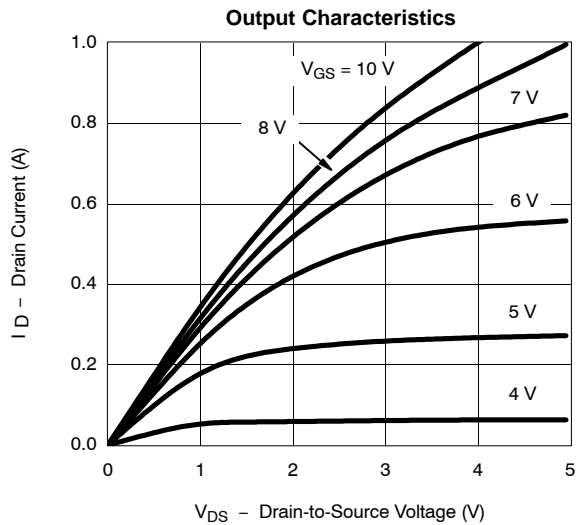
## Notes

a. For DESIGN AID ONLY, not subject to production testing.

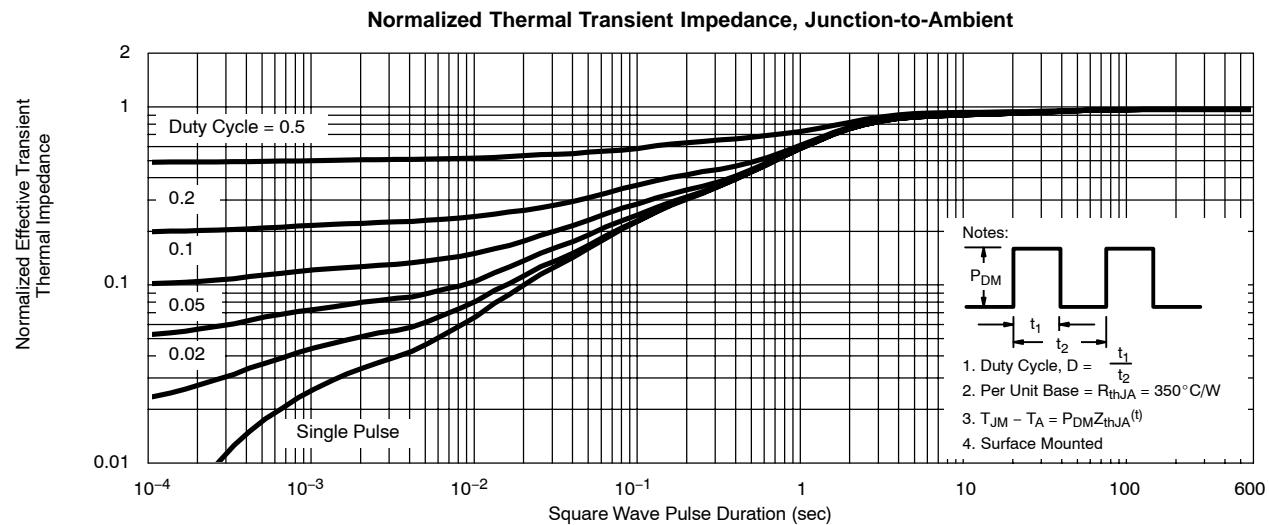
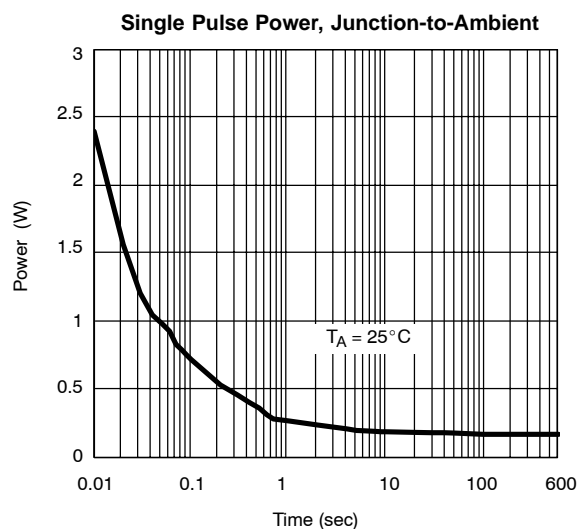
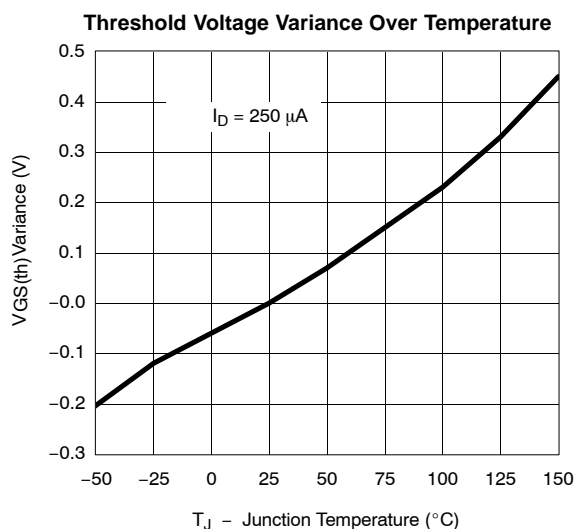
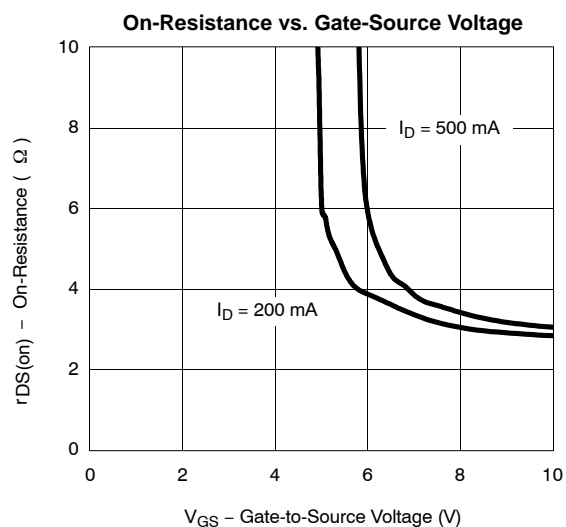
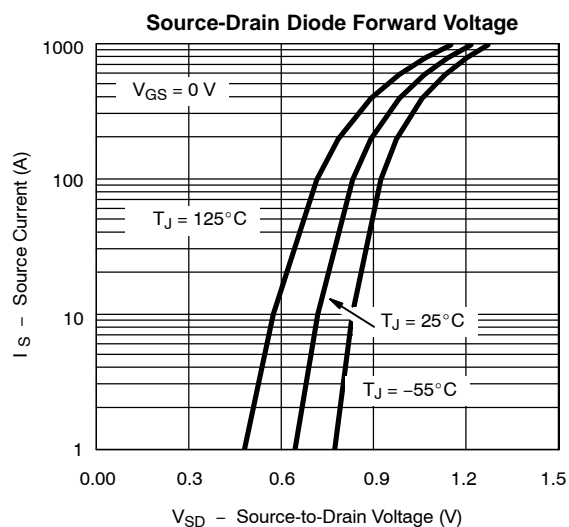
b. Pulse test: PW ≤ 300 μs duty cycle ≤ 2%.

c. Switching time is essentially independent of operating temperature.

VPDS06

**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

## TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)





### Disclaimer

All product specifications and data are subject to change without notice.

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# ***Checklist after service of class TD Mark II***

*C 16:4, C 28:4, C 48:4, C 68:4, C 88:4,*

*FP 4000, FP 6000Q, FP 7000, FP 9000, FP 10000Q, FP 13000 & FP 14000*

***Created by: Patrick Bergwall***

***Date: 2007-04-23***

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## Index

<b>1</b>	<b>INTRODUCTION .....</b>	<b>3</b>
<b>2</b>	<b>CHECK LIST CLASS TD MARK II.....</b>	<b>3</b>



## 1 Introduction

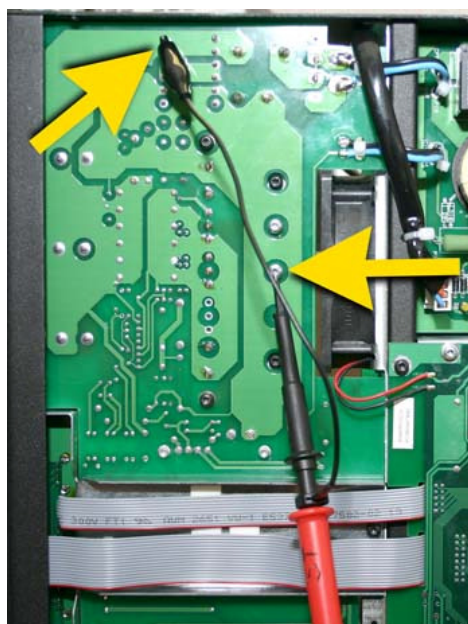
This checklist shall be used to make sure the amplifier is always checked in a proper way after service has been done. It is important to follow the steps in this check list and check all points so that the set up of parameters in the amplifier is correct adjusted. When have done all checks and adjusted the parameters the amplifier will work properly and will have the output power that it is designed for.

## 2 Check list class TD Mark II

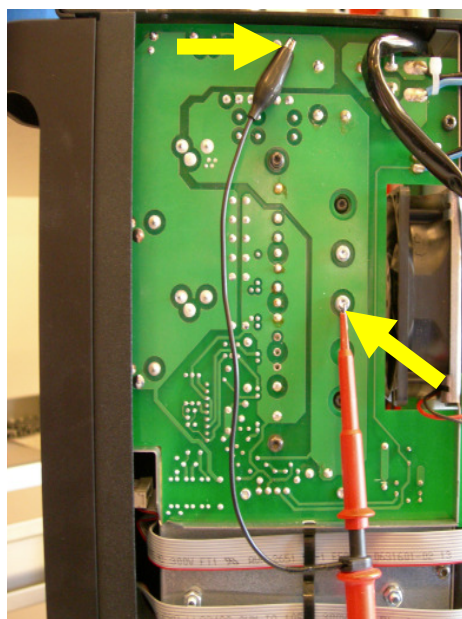
Always clean the amplifier by blowing with compressed air through coolers and fans. Be careful when blowing where big electrolytic capacitors are placed so that the capacitor doesn't get damaged.

1) After repair always start the amplifier with current potentiometer (VR1) located on PWMF1-board. On is clockwise (cw) and off is counter clockwise (ccw). Check that the switch pulse is normal. 300V line should increase some volts when relay clicks.

1.	Connect an oscilloscope probe.		
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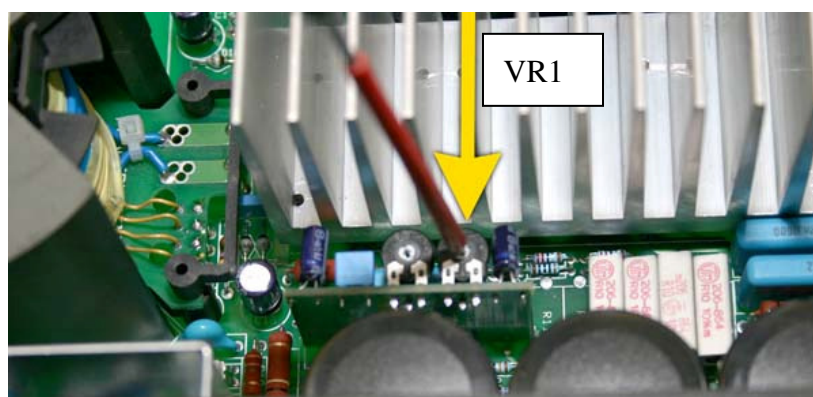


Measuring points (old layout).



Measuring points (new layout).

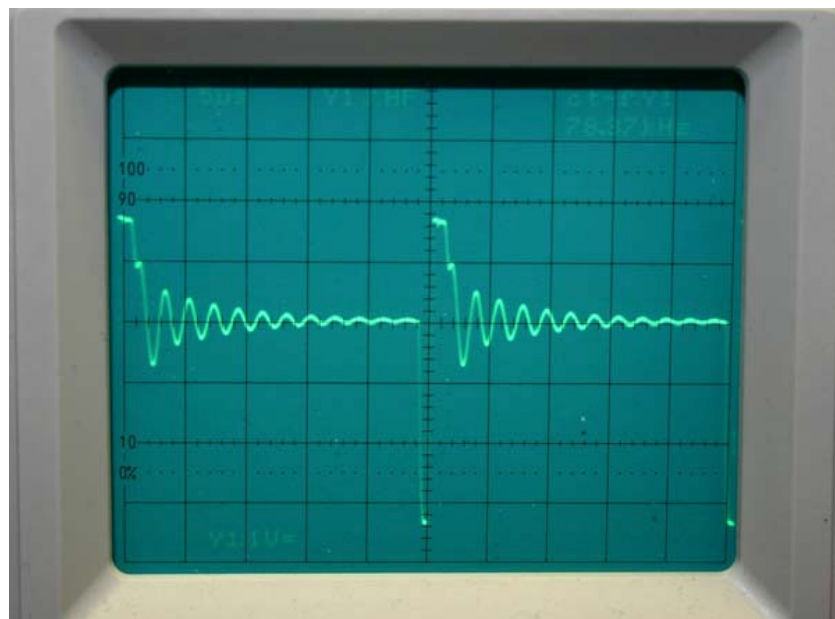
2.	VR1 fully ccw.		VR1-PWMF1
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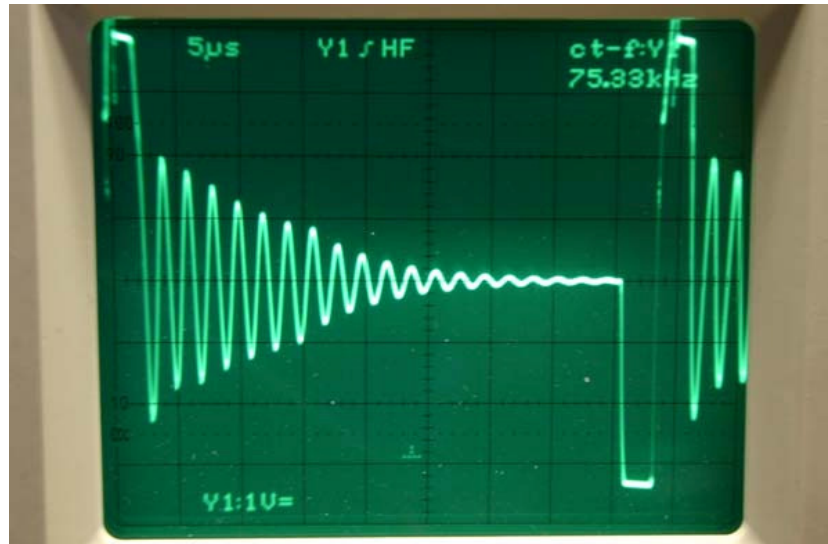
3.	Insert mains plug into variac.		
4.	Mains switch <b>ON</b> and remote switch <b>MANUAL</b>		



5.	Slowly turn variac up, at the same time look at power-supply oscilloscope.	<b>230VAC</b>	
6.	Begin turning VR1 cw. Waveform should look like below picture.		



7.	At a certain point, power supply will regulate. Then, turn current potentiometer fully cw.	120-140V	+/- RAIL
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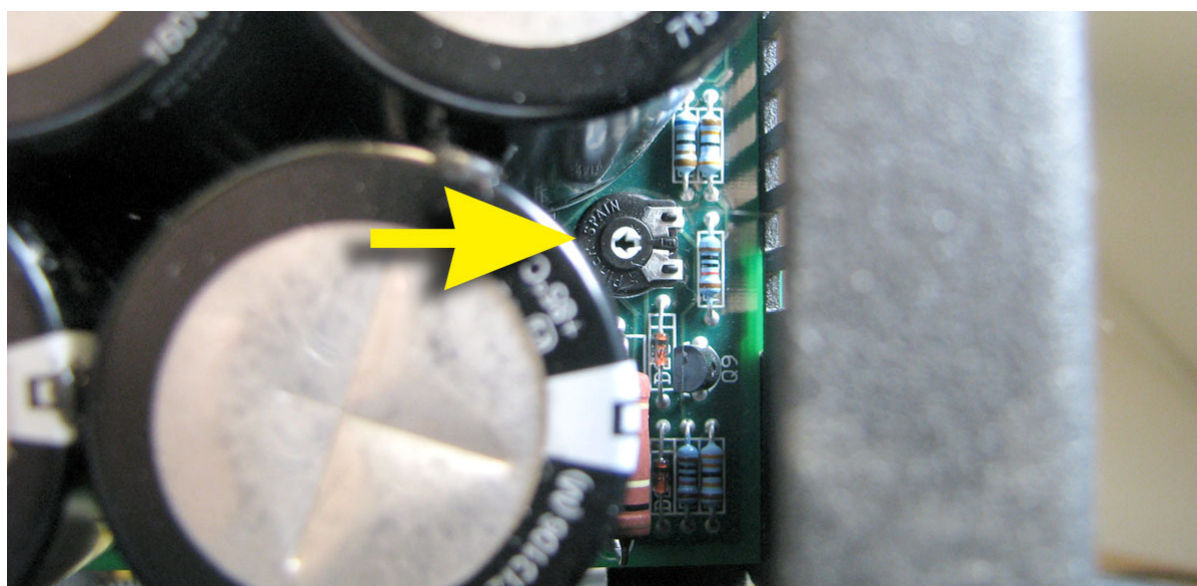
8.	Power supply frequency decreases, PAL led goes out.	23kHz	43μS
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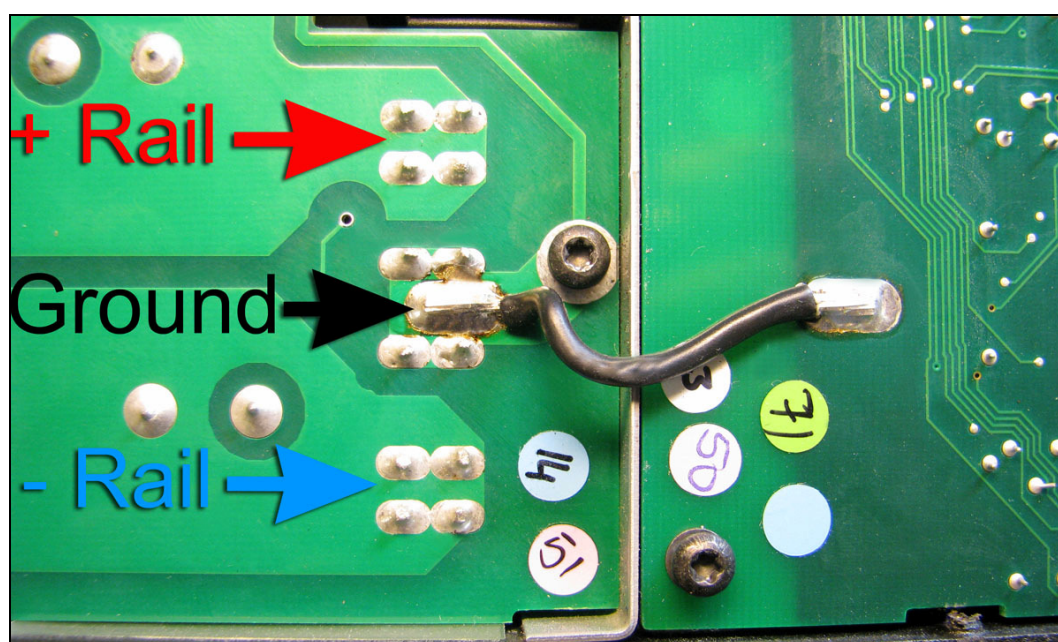
## Step 9, 10

Only for C 16:4, C 28:4, C 48:4, C 68:4, C 88:4, FP 4000, FP 6000Q, FP 7000  
& FP 10000Q.

9.	Begin turning voltage adjust potentiometer. At 174V (+/- 2V) power supply will stop.	ca +/- 174V	VR1-SP100F/ VR1-SP130F
10.	Adjust voltage.	+/- 160V	VR1-SP100F/ VR1-SP130F



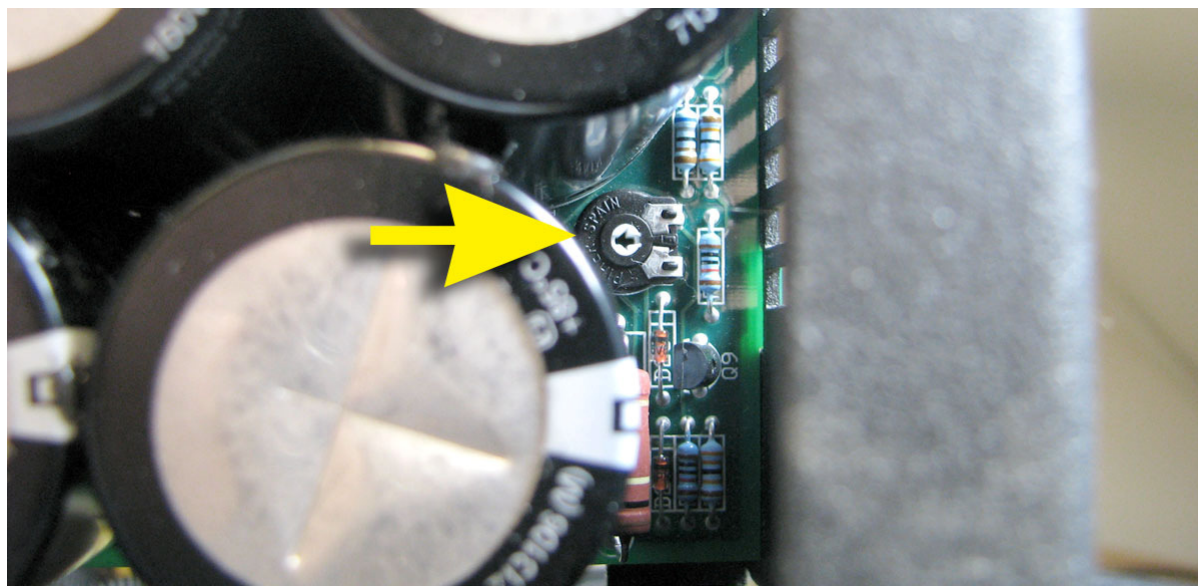
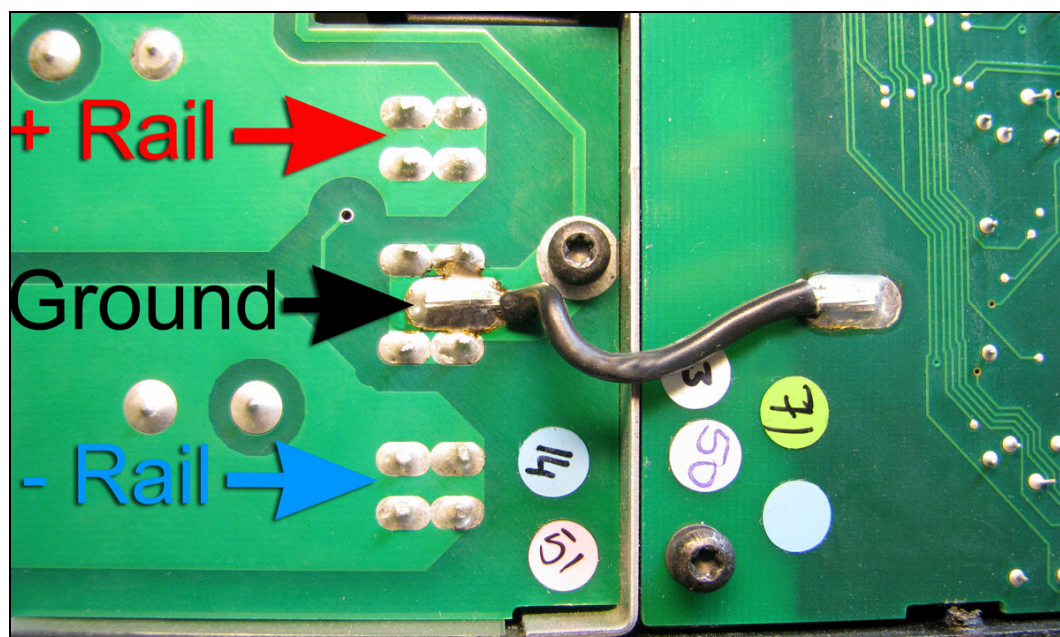
Adjustment point



Measuring points

**Step 11, 12****Only for FP 9000, FP 13000 & FP 14000.**

11.	Begin turning voltage adjust potentiometer. At 220V (+/- 2V) power supply will stop.	ca +/- 220V	VR1-SP130F
12.	Adjust voltage.	+/- 200V	VR1-SP130F

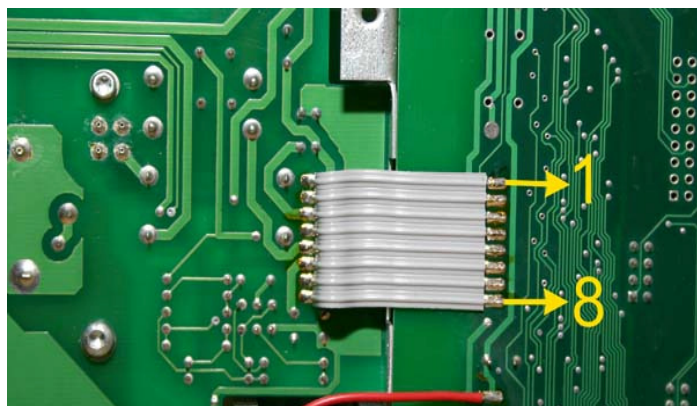
**Adjustment point****Measuring points**



### Step 13

**Only for C 16:4, C 28:4, C 48:4, C 68:4, C 88:4, FP 4000, FP 6000Q, FP 7000 & FP 10000Q.**

13.	Measure voltages according to chart:		
-----	--------------------------------------	--	--

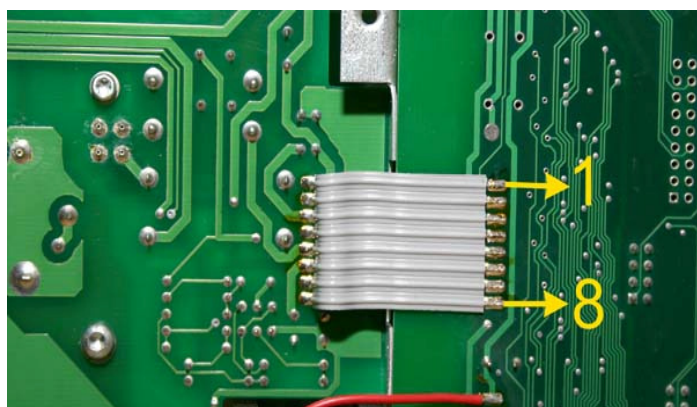


1	GND	-
2	ca 2V	Trafotemp
3	+25V	15VUnr
4	GND	-
5	+58V	50VUnr
6	-18V	50VUNrR
7	+15V	Pwrgood
8	+5V	PAL

### Step 14

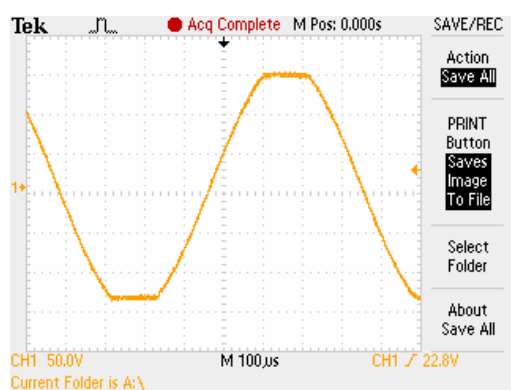
**Only for FP 9000, FP 13000 & FP 14000.**

14.	Measure voltages according to chart:		
-----	--------------------------------------	--	--

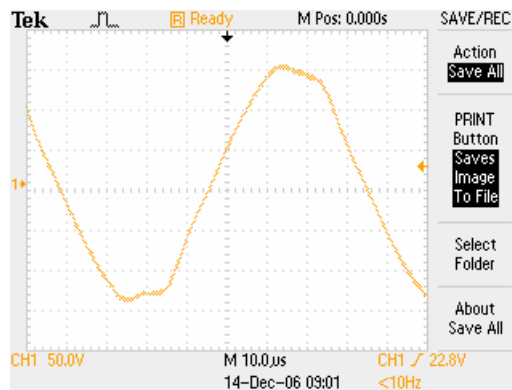


1	GND	-
2	ca 2V	Trafotemp
3	+22-23V	15VUnr
4	GND	-
5	+52-53V	50VUnr
6	-18V	50VUNrR
7	+15V	Pwrgood
8	+5V	PAL

15.	<p>Following tests are made for all Channels, check offset with <b>no input</b> +/- 40mV.</p> <p>Following tests are made for all Channels, check offset with <b>no input and no load</b> +/- 2V.</p> <p>Increase input signal and check output signal at clip 8Ω</p>		
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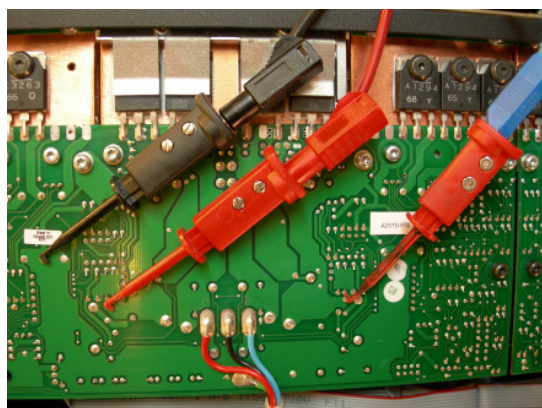
Wave measured at 1.3kHz.



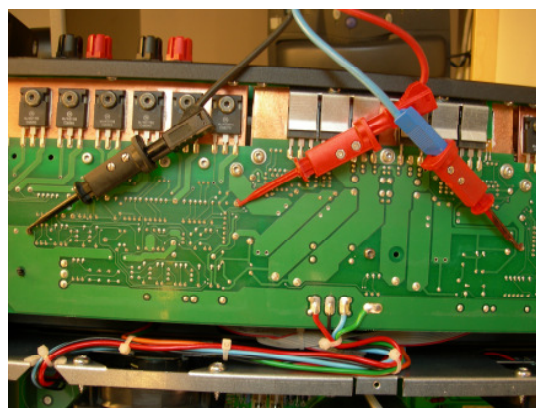
Wave measured at 13kHz.



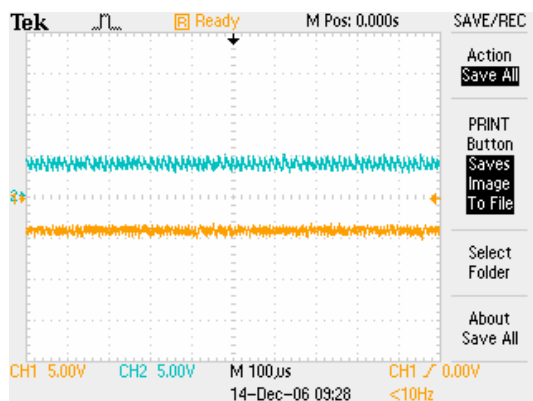
16.	Check HF-wave at 1.3kHz and 13kHz at 8Ω.		
-----	--	--	--



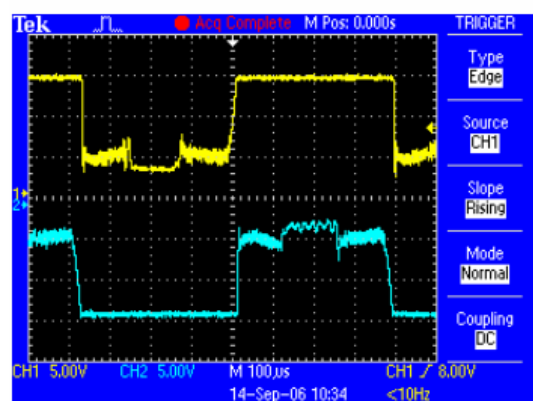
4 channel amplifier



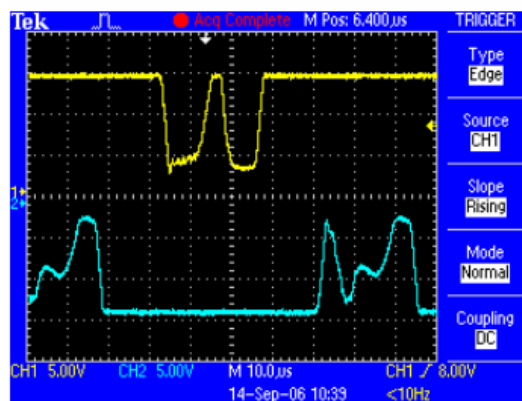
2 channel amplifier



No input signal

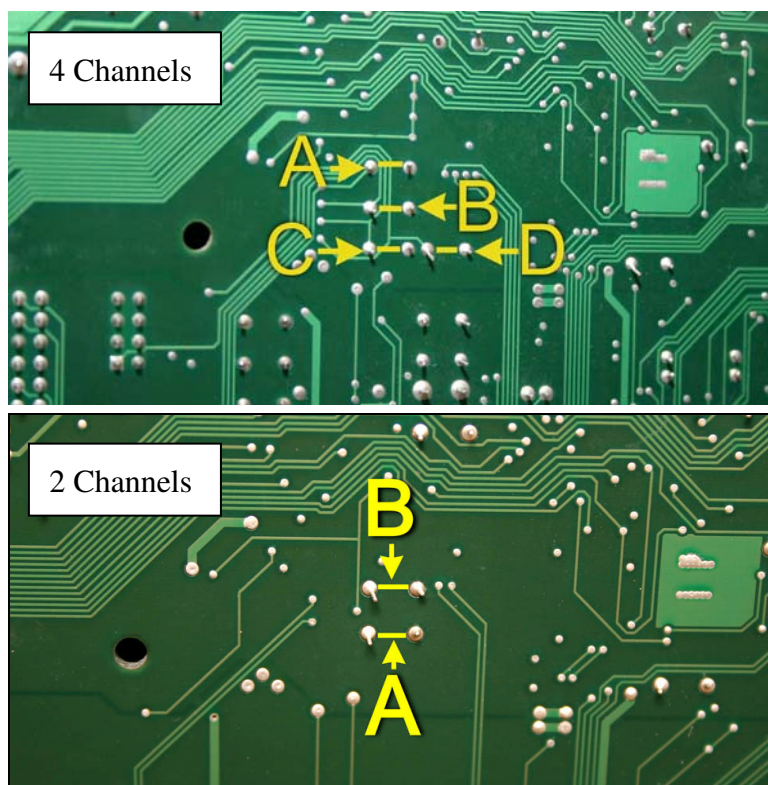


Clip 1.3 kHz.



Clip 13 kHz.

17.	Power supply frequency increases when loaded.	<b>40kHz</b>	
18.	Short capacitors according to pictures (Ch A=C1, Ch B=C101, Ch C=C201, Ch D=C301). Fans will increase speed, TEMP leds on front will light, Signal will go out.	<b>AICO</b>	



19) Check mains switch for bad contact (click noise).

20) Check gain potentiometers at front. No disturbance at output signal shall be detected when turning the potentiometer from one end point to the other end point.

21) Check dust filter, change when needed.

# ***Technical Service Bulletin***

***Created by: Lab.gruppen AB Service Department***

***Date: 080319***

***Reference no: A25TD14b***

---

## ***Affected models***

---

Following models are affected by this technical service bulletin:

C68:4

C48:4

C28:4

C16:4

## ***Affected boards/modules***

---

A25TD14b, AICO410d, AICO410e.

## ***Symptom***

---

A25TD14b does not fit together with AICO410d. If changing A25TD module to A25TD14b AICO410d must be rebuilt to an AICO410e. See table below for modifications on AICO410d to be rebuilt to an AICO410e.

## **Solution**

See table below for modifications on AICO410d to be rebuilt to an AICO410e. Exchange resistors according to table below to rebuild the AICO410d to AICO410e.

Explanation to the resistors value: 24K.125W1%0805 equals a SMD resistor (0805) with the value of 24k $\Omega$ , 0.125W and 1% accuracy.

Position	Value on component on AICO410d	Value on component on AICO410e
R1	24K.125W1%0805	100K.125W1%0805
R101	24K.125W1%0805	100K.125W1%0805
R201	24K.125W1%0805	100K.125W1%0805
R301	24K.125W1%0805	100K.125W1%0805
R2	120K.125W1%0805	270K.125W1%0805
R102	120K.125W1%0805	270K.125W1%0805
R202	120K.125W1%0805	270K.125W1%0805
R302	120K.125W1%0805	270K.125W1%0805
R96	0R.125W1%0805	330K.125W1%0805
R196	0R.125W1%0805	330K.125W1%0805
R296	0R.125W1%0805	330K.125W1%0805
R396	0R.125W1%0805	330K.125W1%0805

It is common SMD resistors that shall be used. Those might be purchased at a local dealer.

## **Note**

It is different A25TD modules for different amplifiers.

## **Part numbers**

Model	Part numbers
C68:4	A25TD14b, AICO410d, AICO410e, also see table above
C48:4	A25TD14b, AICO410d, AICO410e, also see table above
C28:4	A25TD14b, AICO410d, AICO410e, also see table above
C16:4	A25TD14b, AICO410d, AICO410e, also see table above

## History

Date	Created By	Status	Bulletin no.	Comment
080319	JF	SHARP	2	

# Technical Service Bulletin No. 16

**Created by: Lab.gruppen AB Service Department**

**Date: 100628**

**Reference no: Unstable rail voltage, not able to adjust rail voltage.**

## Affected models

Following models are affected by this technical service bulletin:

C:16, C:28, C:48, C:68 & C:88.

FP 4000, FP 6000Q, FP 7000, FP 9000, FP 10000Q, FP 13000 & FP 14000.

## Affected boards/modules

SP100, SP130 and SP140.

## Symptom

Unstable rail voltage, not able to adjust rail voltage.

PSU clicking on and off all the time and PAL led lights up.

## Solution

1. Check if there is contact between + rail and R32 & R34.
2. Check if there is contact between – rail and R33.
3. If not repair foil pattern and check D23, D24, D25, D26, D27, Q8, Q9 & Q10.
4. Update OVP circuit if needed, regarding to instruction (Only SP100 & SP130).

## History

Date	Created By	Status	Bulletin no.	Comment
100628	PB	Sharp	16	

# Technical Service Bulletin No. 27

**Created by:** Lab.gruppen AB Service Department

**Date:** 2011-10-11

**Reference no:** C12

It is highly recommended to implement this service bulletin as preventative maintenance if the unit is serviced for another issue.

## Affected models

FP+.

C16:4, C28:4, C48:4, C68:4, C88:4.

PLM10000Q, PLM14000.

## Affected boards/modules

SP100FXXx-FXX

SP130FXXx-FXX

SP140F01a-FXX, SP140F01b-FXX

## Symptom

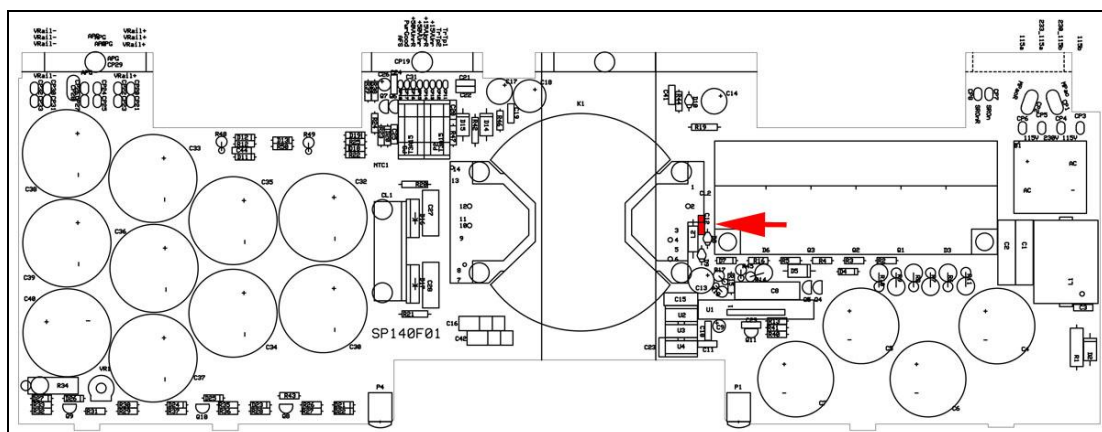
Screaming sound from power supply if amplifier powers up.

Amplifier does not power up.

## Solution

Replace capacitor C12 with either of below listed components.

Lab Part No.	Description	Amount	Info	Pos
6n8250VMMK5	Wima: FKS2 6800PF 10% 400VDC	1		C12
6n8250VMMK5	Epcos: B32529-C3682-K289	1		C12



## Service Log Information

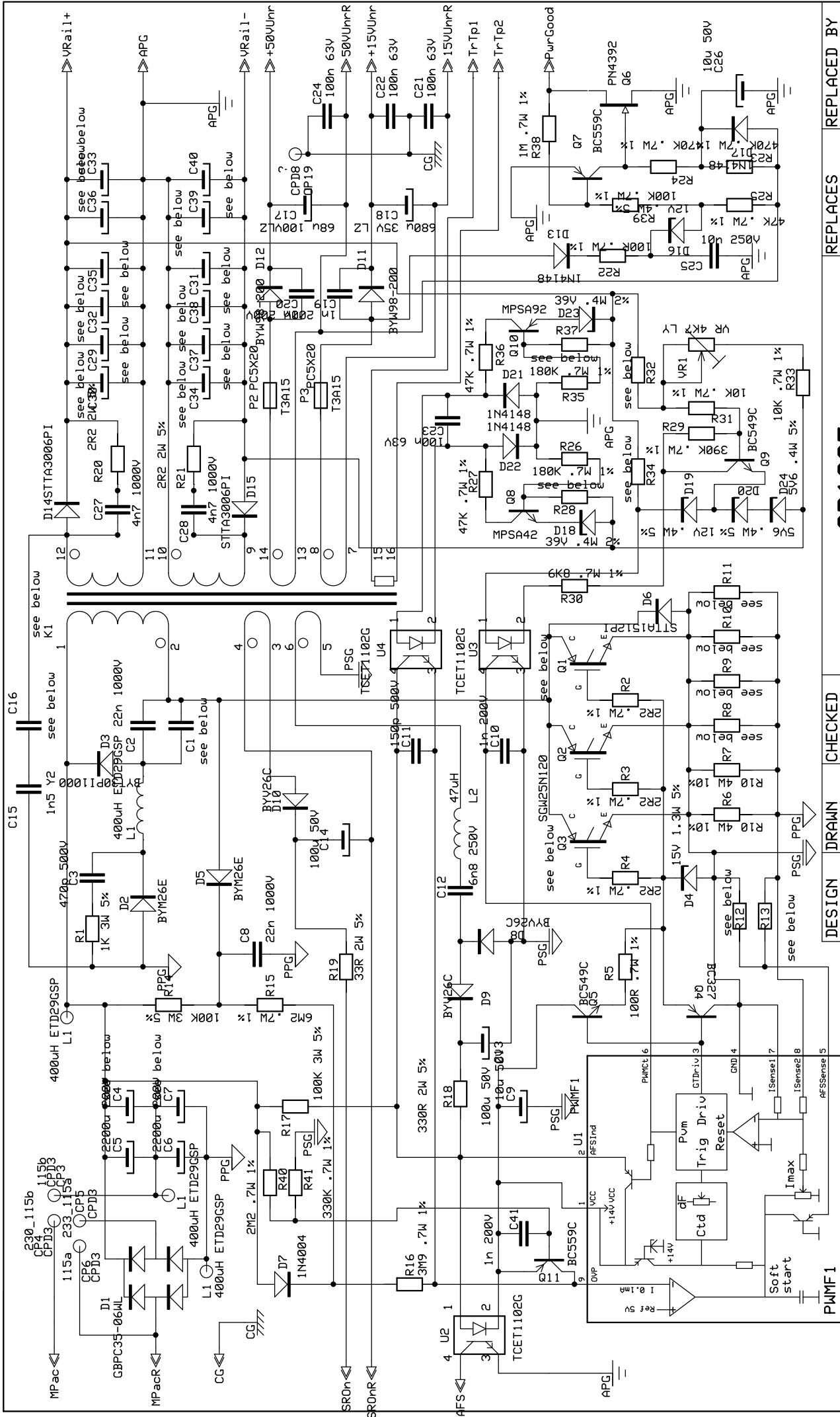
Write "Technical Service Bulletin no.27" in column "Repair Remedy" besides other normal repair information.

## History

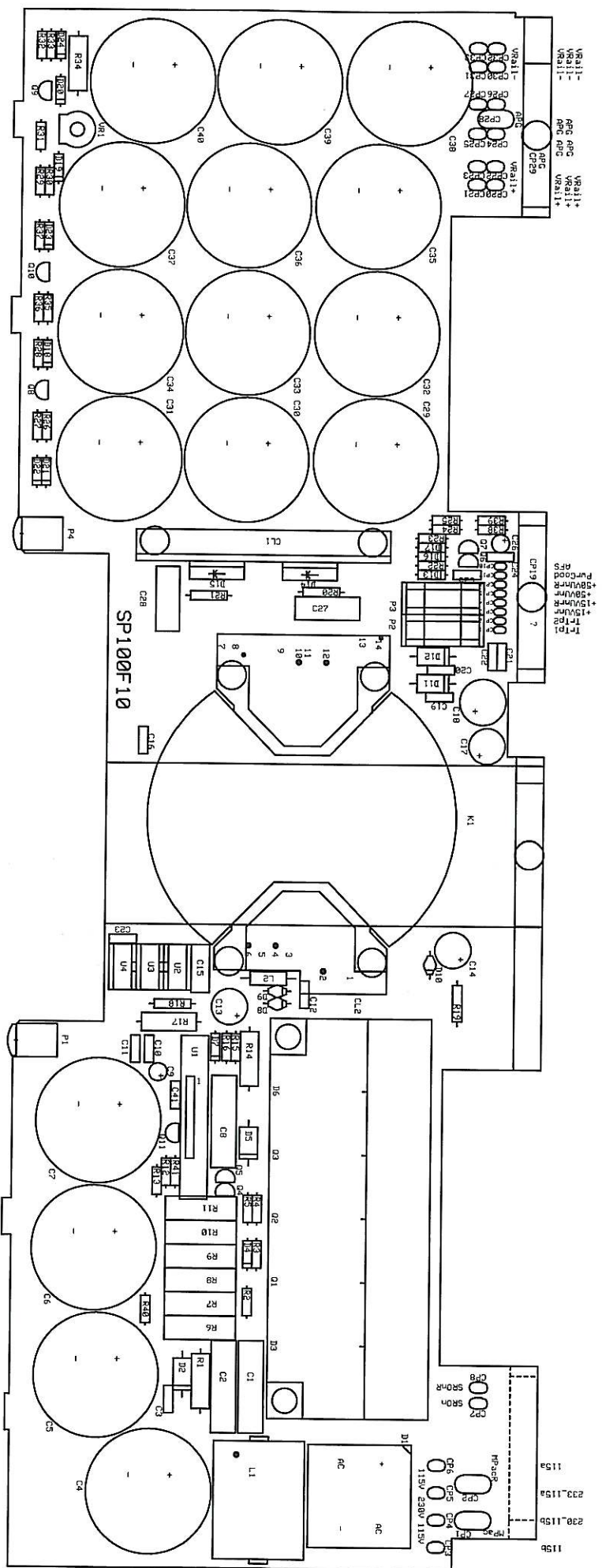
Date	Created By	Status	Bulletin no.	Comment
2011-10-11	CL	SHARP	27	C12







DESIGN	DRAWN	CHECKED	REPLACES	REPLACED BY
KA	KA	KA	050518	050518
LABGRUPPEN			DATE	PAGE
KUNGSBACKA SWEDEN			051127	2
Switch mode Powersupply 10kW Flyback			DRAWING NO	SP100F10



DESIGN	DRAWN	CHECKED	REPLACES	REPLACED BY
KA	KA		SP100F	
LABGRUPPEN			Switch mode PSU 10kW Flyback	
KUNGSBACKA SWEDEN				
			DATE 051127	PAGE
			DRAWING NO SP100F10	

Senast ändrad: see filename

DESIGNATOR	PARTNUMBER	PARTNAME	OBJLAYER	MOUNT
	<u>Smallest denominator</u>	<u>Hole mounting</u>		
C1	Cxx variant dependent	see below	TOP	
C2	22n1000VMKP22.5	22n 1000V	TOP	
C3	470p500VY5P5%5	470p 500V	TOP	
C4	-	see below	TOP	
C5	2200u200V35x55	2200u 200V	TOP	
C6	2200u200V35x55	2200u 200V	TOP	
C7	-	see below	TOP	
C8	22n1000VMKP22.5	22n 1000V	TOP	
C9	10u50V	10u 50V	TOP	
C10	1n200VNP05%5	1n 200V	TOP	
C11	150p500VK20005%5	150p 500V	TOP	
C12	6n8250VMMK5	6n8 250V	TOP	
C13	100u50V	100u 50V	TOP	
C14	100u50V	100u 50V	TOP	
C15	1n5250VY1Y5P10	1n5250VY1Y5P10	TOP	
C16	220p2000VB310%5	see below	TOP	
C17	68u100VLZ	68u 100VLZ	TOP	
C18	680u35VLZ	680u 35V LZ	TOP	
C19	1n200VNP05%5	1n 200V	TOP	
C20	1n200VNP05%5	1n 200V	TOP	
C21	100n63VMMK5	100n 63V	TOP	
C22	100n63VMMK5	100n 63V	TOP	
C23	100n63VMMK5	100n 63V	TOP	
C24	100n63VMMK5	100n 63V	TOP	
C25	10n250VMMK5	10n 250V	TOP	
C26	10u50V	10u 50V	TOP	
C27	4n71000VMKP15	4n7 1000V	TOP	
C28	4n71000VMKP15	4n7 1000V	TOP	
C29	Cxx variant dependent	see below	TOP	
C30	2200u160V35x45	see below	TOP	
C31	2200u160V35x45	see below	TOP	
C32	Cxx variant dependent	see below	TOP	
C33	Cxx variant dependent	see below	TOP	
C34	Cxx variant dependent	see below	TOP	
C35	Cxx variant dependent	see below	TOP	
C36	Cxx variant dependent	see below	TOP	
C37	Cxx variant dependent	see below	TOP	
C38	Cxx variant dependent	see below	TOP	
C39	Cxx variant dependent	see below	TOP	
C40	Cxx variant dependent	see below	TOP	
C41	1n200VNP05%5	1n 200V	TOP	
D2	BYM26E	BYM26E	TOP	
D4	15V1.3W5%	15V 1.3W 5%	TOP	
D5	BYM26E	BYM26E	TOP	
D7	1N4004	1N4004	TOP	
D8	BYV26C	BYV26C	TOP	
D9	BYV26C	BYV26C	TOP	

D10	BYV26C	BYV26C	TOP
D11	BYW98-200	BYW98-200	TOP
D12	BYW98-200	BYW98-200	TOP
D13	1N4148	1N4148	TOP
D16	12V.4W5%	12V .4W 5%	TOP
D17	1N4148	1N4148	TOP
D18	39V.4W2%	39V .4W 2%	TOP
D19	12V.4W5%	12V .4W 5%	TOP
D20	5V6.4W2%	5V6.4W2%	TOP
D21	1N4148	1N4148	TOP
D22	1N4148	1N4148	TOP
D23	39V.4W2%	39V .4W 2%	TOP
D24	5V6.4W2%	5V6.4W2%	TOP
L1	400uHETD29ST	400uH ETD29GSP	TOP
L2	47uHA	47uH	TOP
P1	TPC90M3	TPC90M3	TOP
P2	FBPC5x209M	PC5X20	TOP
P3	FBPC5x209M	PC5X20	TOP
P4	TPC90M3	TPC90M3	TOP
Q4	BC327	BC327	TOP
Q5	BC549C	BC549C	TOP
Q6	PN4392	PN4392	TOP
Q7	BC559C	BC559C	TOP
Q8	MPSA42	MPSA42	TOP
Q9	BC549C	BC549C	TOP
Q10	MPSA92	MPSA92	TOP
Q11	BC559C	BC559C	TOP
R1	1K3W5% (5mm stand-off)	1K3W5% (5mm stand-off)	TOP
R2	2R2.7W1%	2R2.7W1%	TOP
R3	2R2.7W1%	2R2.7W1%	TOP
R4	2R2.7W1%	2R2.7W1%	TOP
R5	100R.7W1%	100R .7W 1%	TOP
R6	R105W2% (5mm stand-off)	R10 5W 2% (5mm stand-off)	TOP
R7	R105W2% (5mm stand-off)	R10 5W 2% (5mm stand-off)	TOP
R8	Rxx variant dependent	see below	TOP
R9	Rxx variant dependent	see below	TOP
R10	Rxx variant dependent	see below	TOP
R11	Rxx variant dependent	see below	TOP
R12	-	see below	TOP
R13	-	see below	TOP
R14	100K3W5% (5mm stand-off)	100K 3W 5% (5mm stand-off)	TOP
R15	6M2.7W1%	6M2 .7W 1%	TOP
R16	3M9.7W1%	3M9 .7W 1%	TOP
R17	100K3W5% (5mm stand-off)	100K 3W 5% (5mm stand-off)	TOP
R18	330R2W5% (5mm stand-off)	330R 2W 5% (5mm stand-off)	TOP
R19	33R2W5% (5mm stand-off)	33R2W5% (5mm stand-off)	TOP
R20	2R22W5%	2R2 2W 5%	TOP
R21	2R22W5%	2R2 2W 5%	TOP
R22	100R.7W1%	100R .7W 1%	TOP
R23	470K.7W1%	470K .7W 1%	TOP
R24	470K.7W1%	470K .7W 1%	TOP
R25	47K.7W1%	47K .7W 1%	TOP

R26	180K.7W1%	180K.7W1%	TOP
R27	47K.7W1%	47K .7W 1%	TOP
R28	56K.7W1%	see below	TOP
R29	390K.7W1%	390K .7W 1%	TOP
R30	6K8.7W1%	6K8 .7W 1%	TOP
R31	10K.7W1%	10K.7W1%	TOP
R32	330K.7W1%	see below	TOP
R33	10K.7W1%	10K .7W 1%	TOP
R34	100K3W5% (5mm stand-off)	see below	TOP
R35	180K.7W1%	180K.7W1%	TOP
R36	47K.7W1%	47K .7W 1%	TOP
R37	56K.7W1%	56K .7W 1%	TOP
R38	1M.7W1%	1M.7W1%	TOP
R39	100K.7W1%	100K.7W1%	TOP
R40	2M2.7W1%	2M2.7W1%	TOP
R41	330K.7W1%	330K.7W1%	TOP
U2	TCET1102G	TCET1102G	TOP
U3	TCET1102G	TCET1102G	TOP
U4	TCET1102G	TCET1102G	TOP
VR1	VR4K7LY2X3M	VR 4K7 LY	TOP
BOARD	SP100F	SP100F	TOP

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	<b><u>Smallest Denomination</u></b>	<b><u>Final assembly</u></b>	
-	SP100F-H02	Hole mounted board	
see instruction	SSP100F-M02	part no. Label	see instruction
CL1	COATO247x2	COATO247x2	see instruction
CL2	COAEXTO247x5	COAEXTO247x5	see instruction
CP20	AWG18RED300VWW1	à 28 cm	see instruction
CP21	AWG18RED300VWW1	à 46 cm	see instruction
CP22	AWG18RED300VWW1	à 28 cm	see instruction
CP23	AWG18RED300VWW1	à 46 cm	see instruction
CP24	AWG20BLK300VWW1	à 28 cm	see instruction
CP25	AWG20BLK300VWW1	à 46 cm	see instruction
CP26	AWG20BLK300VWW1	à 28 cm	see instruction
CP27	AWG20BLK300VWW1	à 46 cm	see instruction
CP30	AWG18BLU300VWW1	à 28 cm	see instruction
CP31	AWG18BLU300VWW1	à 46 cm	see instruction
CP32	AWG18BLU300VWW1	à 28 cm	see instruction
CP33	AWG18BLU300VWW1	à 46 cm	see instruction
D1	GBPC35-06WL	GBPC35-06WL	see instruction
D14	STTA3006PI	STTA3006PI	see instruction
D15	STTA3006PI	STTA3006PI	see instruction
D3	BYT30PI1000	BYT30PI1000	see instruction
D6	STTA1512PI	STTA1512PI	see instruction
Q1	Qxx variant dependent	see below	see instruction
Q2	SGW25N120	SGW25N120	see instruction
Q3	Qxx variant dependent	see below	see instruction
see instruction	COADB1	COADB1	see instruction
see instruction	MRT204x20	MRT204x20	see instruction
see instruction	M6MM4	M6MM4	see instruction
see instruction	FBF4.1SV	FBF4.1SV	see instruction

see instruction	RTK10ST2.9x9.5	RTK10ST2.9x9.5	see instruction
see instruction	MRTGF3x8FBBBRBSV	MRTGF3x8FBBBRBSV	see instruction
see instruction	MRT103x12	MRT103x12	see instruction
see instruction	FB3.1	FB3.1	see instruction
see instruction	BRB3.2x6x.5SV	BRB3.2x6x.5SV	see instruction
see instruction	CT98x2.5	CT98x2.5	see instruction
see instruction	T3A15250-5x20	see below	see instruction
see instruction	ST3A15AL250-5x20	see below	see instruction
U1	PWMF1-F01	PWMF1	see instruction

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	<b><u>Mounted at Lab.gruppen</u></b>		
SUBxxx	SP100F-M02		
LSxxx	SSP100F-F02		
R13	5K36.7W1%	see below	TOP
LSxxx	-		
K1	T2K5WF160VPM8770	see below	see instruction
C4	2200uF200V35x45		
C7	2200uF200V35x45		
C33	2200uF160V35x45		
C34	2200uF160V35x45		
see instruction	FPMSA	FPMSA	see instruction
see instruction	MPPM8770	MPPM8770	see instruction
see instruction	M6MM4	M6MM4	see instruction
see instruction	FB3.1.4SV	FB3.1.4SV	see instruction
see instruction	CLCFPM8770	CLCFPM8770	see instruction
see instruction	TPT8-2.5x10	TPT8-2.5x10	see instruction
see instruction	FB3.2.6	FB3.2.6	see instruction
see instruction	MRT104x80	special om Torx	see instruction

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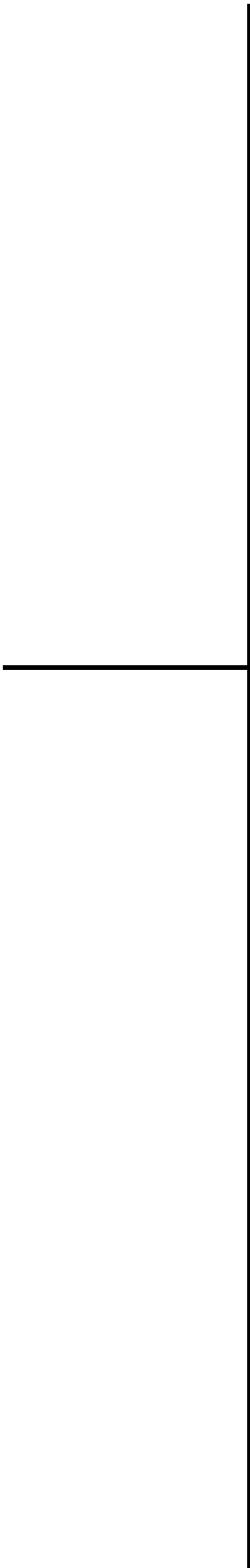


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DESIGNATOR	PARTNUMBER	PARTNAME	OBJLAYER	MOUNT
	<u>Smallest denominator</u>	<u>Hole mounting</u>		
C1	22n1000VMKP22.5	see below	TOP	
C2	22n1000VMKP22.5	22n 1000V	TOP	
C3	470p500VY5P5%5	470p 500V	TOP	
C4	2200u200V35x45	see below	TOP	
C5	2200u200V35x55	2200u 200V	TOP	
C6	2200u200V35x55	2200u 200V	TOP	
C7	2200u200V35x45	see below	TOP	
C8	22n1000VMKP22.5	22n 1000V	TOP	
C9	10u50V	10u 50V	TOP	
C10	1n200VNP05%5	1n 200V	TOP	
C11	150p500VK20005%5	150p 500V	TOP	
C12	6n8250VMMK5	6n8 250V	TOP	
C13	100u50V	100u 50V	TOP	
C14	100u50V	100u 50V	TOP	
C15	1n5250VY1Y5P10	1n5250VY1Y5P10	TOP	
C16	220p2000VB310%5	see below	TOP	
C17	68u100VLZ	68u 100VLZ	TOP	
C18	680u35VLZ	680u 35V LZ	TOP	
C19	1n200VNP05%5	1n 200V	TOP	
C20	1n200VNP05%5	1n 200V	TOP	
C21	100n63VMMK5	100n 63V	TOP	
C22	100n63VMMK5	100n 63V	TOP	
C23	100n63VMMK5	100n 63V	TOP	
C24	100n63VMMK5	100n 63V	TOP	
C25	10n250VMMK5	10n 250V	TOP	
C26	10u50V	10u 50V	TOP	
C27	4n71000VMKP15	4n7 1000V	TOP	
C28	4n71000VMKP15	4n7 1000V	TOP	
C29	Cxx variant dependent	see below	TOP	
C30	2200u160V35x45	see below	TOP	
C31	2200u160V35x45	see below	TOP	
C32	Cxx variant dependent	see below	TOP	
C33	2200u160V35x45	see below	TOP	
C34	2200u160V35x45	see below	TOP	
C35	Cxx variant dependent	see below	TOP	
C36	2200u160V35x45	see below	TOP	
C37	2200u160V35x45	see below	TOP	
C38	Cxx variant dependent	see below	TOP	
C39	Cxx variant dependent	see below	TOP	
C40	Cxx variant dependent	see below	TOP	
C41	1n200VNP05%5	1n 200V	TOP	
D2	BYM26E	BYM26E	TOP	
D4	15V1.3W5%	15V 1.3W 5%	TOP	
D5	BYM26E	BYM26E	TOP	
D7	1N4004	1N4004	TOP	
D8	BYV26C	BYV26C	TOP	
D9	BYV26C	BYV26C	TOP	



D10	BYV26C	BYV26C	TOP
D11	BYW98-200	BYW98-200	TOP
D12	BYW98-200	BYW98-200	TOP
D13	1N4148	1N4148	TOP
D16	12V.4W5%	12V .4W 5%	TOP
D17	1N4148	1N4148	TOP
D18	39V.4W2%	39V .4W 2%	TOP
D19	12V.4W5%	12V .4W 5%	TOP
D20	5V6.4W2%	5V6.4W2%	TOP
D21	1N4148	1N4148	TOP
D22	1N4148	1N4148	TOP
D23	39V.4W2%	39V .4W 2%	TOP
D24	5V6.4W2%	5V6.4W2%	TOP
L1	400uHETD29ST	400uH ETD29GSP	TOP
L2	47uHA	47uH	TOP
P1	TPC90M3	TPC90M3	TOP
P2	FBPC5x209M	PC5X20	TOP
P3	FBPC5x209M	PC5X20	TOP
P4	TPC90M3	TPC90M3	TOP
Q4	BC327	BC327	TOP
Q5	BC549C	BC549C	TOP
Q6	PN4392	PN4392	TOP
Q7	BC559C	BC559C	TOP
Q8	MPSA42	MPSA42	TOP
Q9	BC549C	BC549C	TOP
Q10	MPSA92	MPSA92	TOP
Q11	BC559C	BC559C	TOP
R1	1K3W5% (5mm stand-off)	1K3W5% (5mm stand-off)	TOP
R2	2R2.7W1%	2R2.7W1%	TOP
R3	2R2.7W1%	2R2.7W1%	TOP
R4	2R2.7W1%	2R2.7W1%	TOP
R5	100R.7W1%	100R .7W 1%	TOP
R6	R105W2% (5mm stand-off)	R10 5W 2% (5mm stand-off)	TOP
R7	R105W2% (5mm stand-off)	R10 5W 2% (5mm stand-off)	TOP
R8	R105W2% (5mm stand-off)	see below	TOP
R9	R105W2% (5mm stand-off)	see below	TOP
R10	Rxx variant dependent	see below	TOP
R11	Rxx variant dependent	see below	TOP
R12	-	see below	TOP
R13	2K7.7W1%	see below	TOP
R14	100K3W5% (5mm stand-off)	100K 3W 5% (5mm stand-off)	TOP
R15	6M2.7W1%	6M2 .7W 1%	TOP
R16	3M9.7W1%	3M9 .7W 1%	TOP
R17	100K3W5% (5mm stand-off)	100K 3W 5% (5mm stand-off)	TOP
R18	330R2W5% (5mm stand-off)	330R 2W 5% (5mm stand-off)	TOP
R19	33R2W5% (5mm stand-off)	33R2W5% (5mm stand-off)	TOP
R20	2R22W5%	2R2 2W 5%	TOP
R21	2R22W5%	2R2 2W 5%	TOP
R22	100R.7W1%	100R .7W 1%	TOP
R23	470K.7W1%	470K .7W 1%	TOP
R24	470K.7W1%	470K .7W 1%	TOP
R25	47K.7W1%	47K .7W 1%	TOP

R26	180K.7W1%	180K.7W1%	TOP
R27	47K.7W1%	47K .7W 1%	TOP
R28	56K.7W1%	see below	TOP
R29	390K.7W1%	390K .7W 1%	TOP
R30	6K8.7W1%	6K8 .7W 1%	TOP
R31	10K.7W1%	10K.7W1%	TOP
R32	330K.7W1%	see below	TOP
R33	10K.7W1%	10K .7W 1%	TOP
R34	100K3W5% (5mm stand-off)	see below	TOP
R35	180K.7W1%	180K.7W1%	TOP
R36	47K.7W1%	47K .7W 1%	TOP
R37	56K.7W1%	56K .7W 1%	TOP
R38	1M.7W1%	1M.7W1%	TOP
R39	100K.7W1%	100K.7W1%	TOP
R40	2M2.7W1%	2M2.7W1%	TOP
R41	330K.7W1%	330K.7W1%	TOP
U2	TCET1102G	TCET1102G	TOP
U3	TCET1102G	TCET1102G	TOP
U4	TCET1102G	TCET1102G	TOP
VR1	VR4K7LY2X3M	VR 4K7 LY	TOP
BOARD	SP100F	SP100F	TOP

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	<b><u>Smallest Denomination</u></b>	<b><u>Final assembly</u></b>	
-	SP100F-H03	Hole mounted board	
see instruction	SSP100F-F03	part no. Label	see instruction
CL1	COATO247x2	COATO247x2	see instruction
CL2	COAEXTO247x5	COAEXTO247x5	see instruction
CP20	AWG18RED300VW1	à 28 cm	see instruction
CP21	AWG18RED300VW1	à 46 cm	see instruction
CP22	AWG18RED300VW1	à 28 cm	see instruction
CP23	AWG18RED300VW1	à 46 cm	see instruction
CP24	AWG20BLK300VW1	à 28 cm	see instruction
CP25	AWG20BLK300VW1	à 46 cm	see instruction
CP26	AWG20BLK300VW1	à 28 cm	see instruction
CP27	AWG20BLK300VW1	à 46 cm	see instruction
CP30	AWG18BLU300VW1	à 28 cm	see instruction
CP31	AWG18BLU300VW1	à 46 cm	see instruction
CP32	AWG18BLU300VW1	à 28 cm	see instruction
CP33	AWG18BLU300VW1	à 46 cm	see instruction
D1	GBPC35-06WL	GBPC35-06WL	see instruction
D14	STTA3006PI	STTA3006PI	see instruction
D15	STTA3006PI	STTA3006PI	see instruction
D3	BYT30PI1000	BYT30PI1000	see instruction
D6	STTA1512PI	STTA1512PI	see instruction
Q1	SGW25N120	see below	see instruction
Q2	SGW25N120	SGW25N120	see instruction
Q3	Qxx variant dependent	see below	see instruction
see instruction	COADB1	COADB1	see instruction
see instruction	MRT204x20	MRT204x20	see instruction
see instruction	M6MM4	M6MM4	see instruction
see instruction	FBF4.1SV	FBF4.1SV	see instruction

see instruction	RTK10ST2.9x9.5	RTK10ST2.9x9.5	see instruction
see instruction	MRTGF3x8FBBBRBSV	MRTGF3x8FBBBRBSV	see instruction
see instruction	MRT103x12	MRT103x12	see instruction
see instruction	FB3.1	FB3.1	see instruction
see instruction	BRB3.2x6x.5SV	BRB3.2x6x.5SV	see instruction
see instruction	CT98x2.5	CT98x2.5	see instruction
see instruction	T3A15250-5x20	see below	see instruction
see instruction	ST3A15AL250-5x20	see below	see instruction
U1	PWMF1-F01	PWMF1	see instruction

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	<b><u>Mounted at Lab.gruppen</u></b>		
SUBxxx	SP100F-F03		
LSxxx	-		
R13	-	see below	TOP
LSxxx	LSxx variant dependent		
K1	T5KWF160VPM8770	see below	see instruction
C4	Cxx Variant dependent		
C7	Cxx Variant dependent		
C33	Cxx Variant dependent		
C34	Cxx Variant dependent		
see instruction	FPMSA	FPMSA	see instruction
see instruction	MPPM8770	MPPM8770	see instruction
see instruction	M6MM4	M6MM4	see instruction
see instruction	FB3.1.4SV	FB3.1.4SV	see instruction
see instruction	CLCFPM8770	CLCFPM8770	see instruction
see instruction	TPT8-2.5x10	TPT8-2.5x10	see instruction
see instruction	FB3.2.6	FB3.2.6	see instruction
see instruction	MRT104x80	special om Torx	see instruction

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