

# PJ5KPS-CA

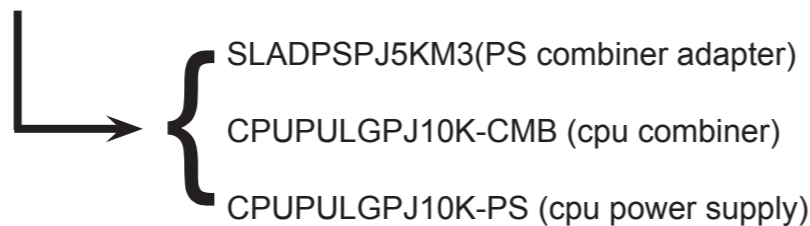
TECHNICAL ANNEX  
VOLUME 2



Rev. 1.2

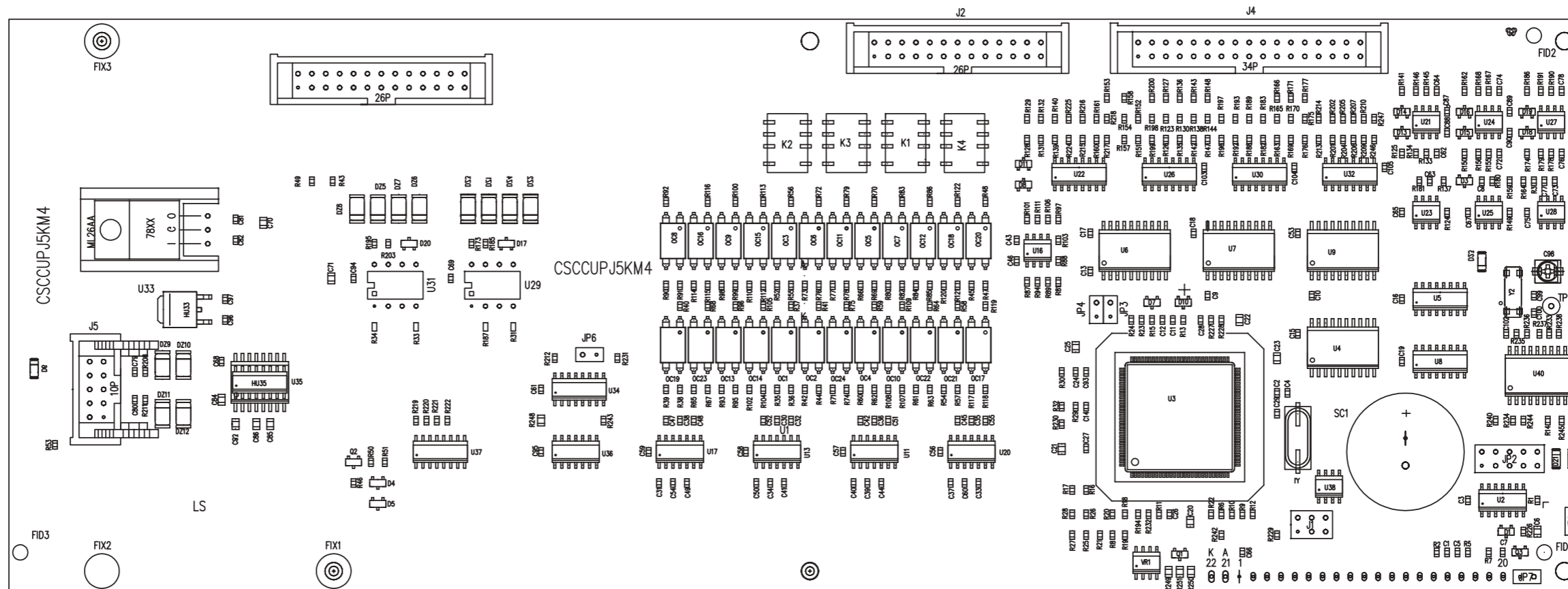
# Component layouts, schematics, bills of material

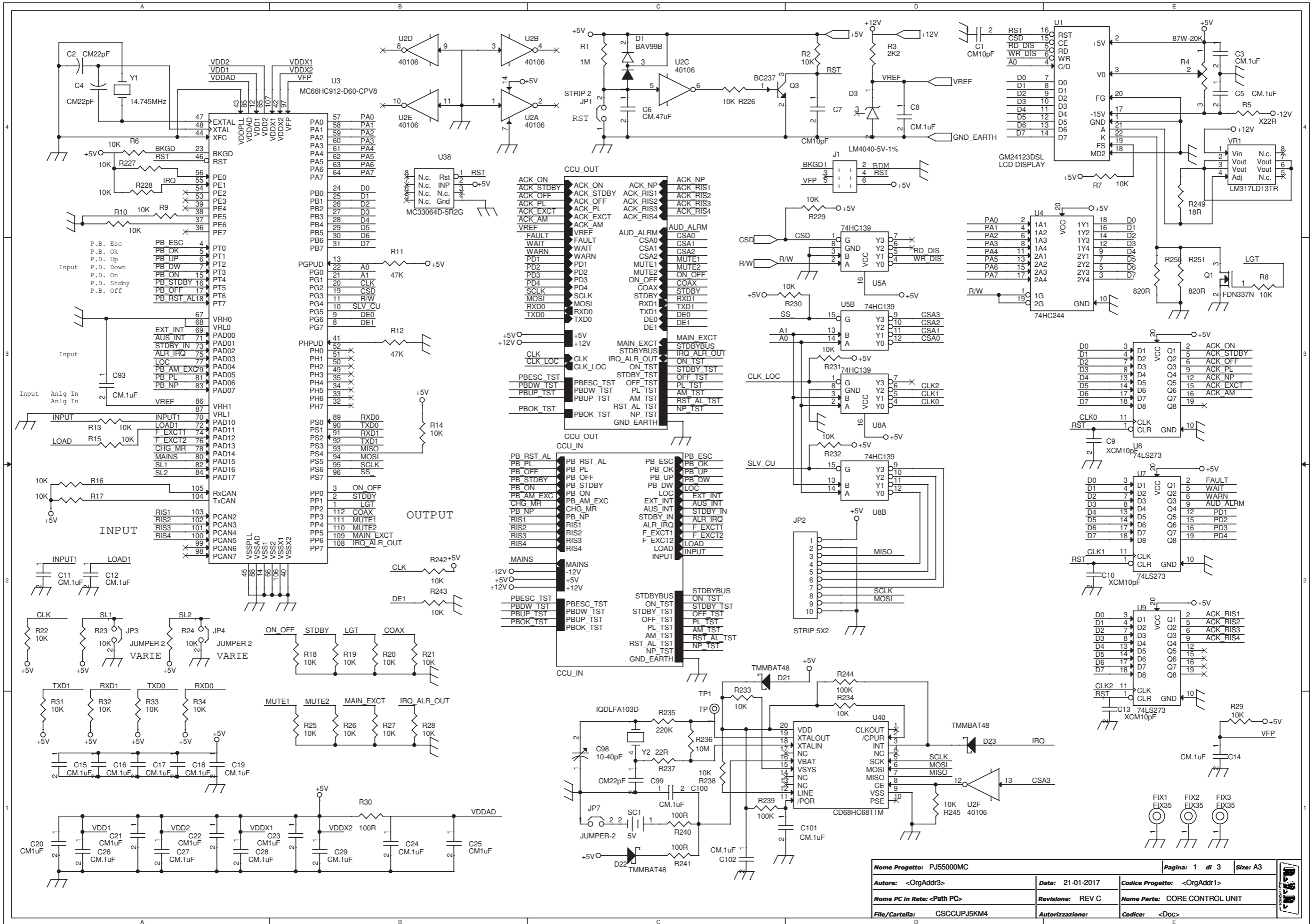
This part of the manual contains the technical details about the different boards of the PJ5KPS-CA. This appendix is composed of the following sections

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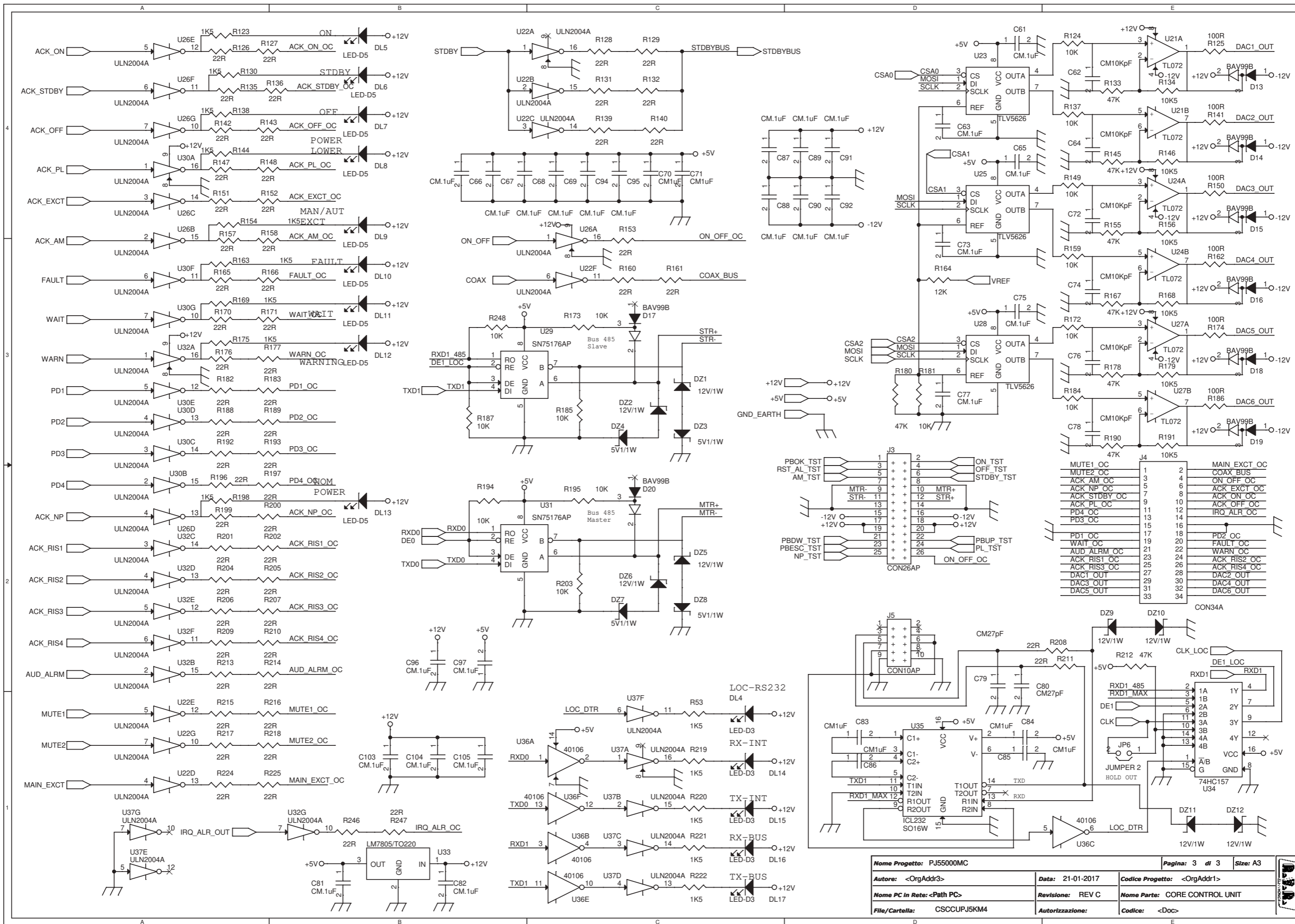
**Core control unit (SLCCUPJ5KM4)**





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Nome PC In Rete: <Path PC>		Revisione: REV C		Nome Parte: CORE CONTROL UNIT	
File/Cartella: CSCCUPJ5KM4		Autortizzazione:		Codice: <Doc>	





Nome Progetto: PJ55000MC		Pagina: 3 di 3		Size: A3
Autore: <OrgAddr3>		Data: 21-01-2017	Codice Progetto: <OrgAddr1>	
Nome PC in Rete: <Path PC>		Revisione: REV C	Nome Parte: CORE CONTROL UNIT	
File/Cartella: CSCCUPJ5KM4		Autorizzazione:	Codice: <Doc>	

CORE CONTROL UNIT Revised: Wednesday, August 02, 2017  
Revision: REV C

PJ55000MC

CSCCUPJ5KM4

21-01-2017

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Item Quantity Reference Part Description

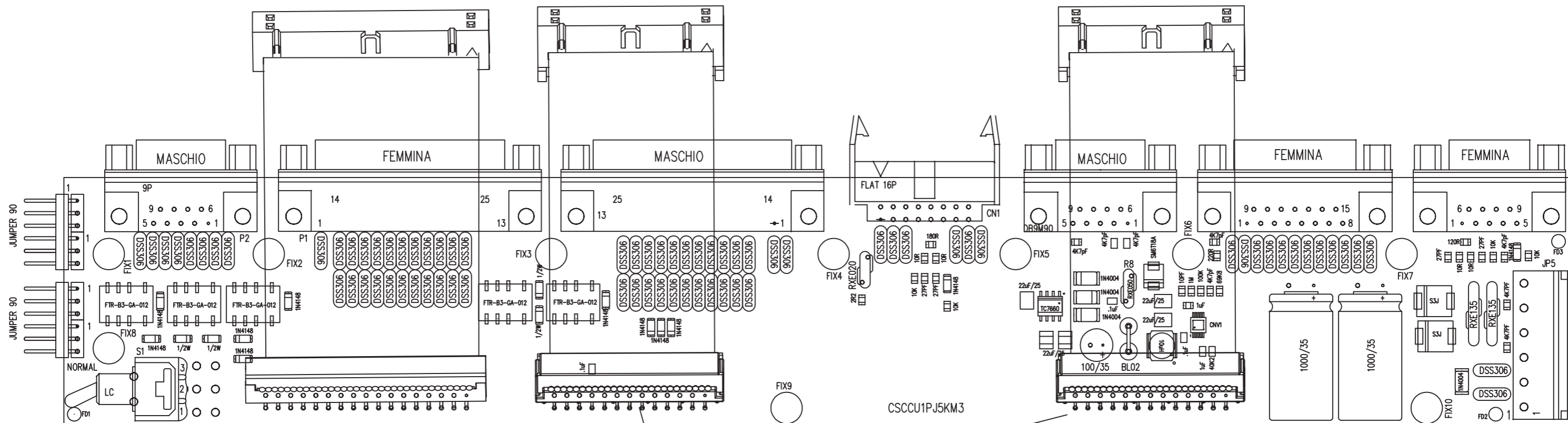
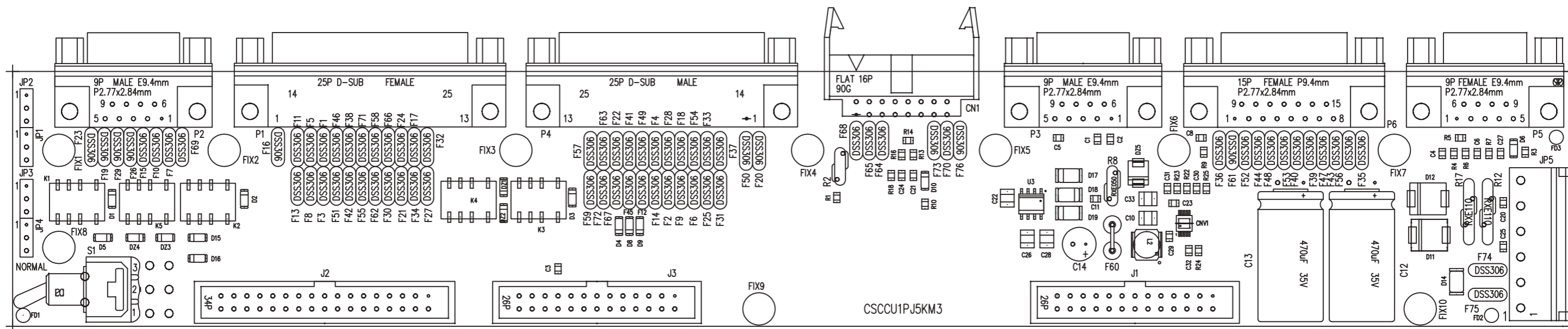
1	2	C1, C7	CM10pF
2	3	C2, C4, C99	CM22pF
3	75	C3, C5, C8, C11, C12, C14, C15, C16, C17, C18, C19, C24, C26, C27, C28, C29, C30, C31, C32, C33, C34, C35, C36, C37, C38, C39, C40, C41, C42, C43, C44, C45, C46, C47, C48, C49, C50, C52, C53, C54, C55, C56, C57, C58, C59, C60, C61, C63, C65, C66, C67, C68, C69, C73, C75, C77, C81, C82, C87, C88, C89, C90, C91, C92, C93, C94, C95, C96, C97, C100, C101, C102, C103, C104, C105	CM.1uF
4	2	C6, C51	CM.47uF
5	3	C9, C10, C13	XCM10pF
6	11	C20, C21, C22, C23, C25, C70, C71, C83, C84, C85, C86	CM1uF
7	6	C62, C64, C72, C74, C76, C78	CM10KpF
8	2	C79, C80	CM27pF
9	1	C98	10-40pF
10	12	DL1, DL2, DL3, DL5, DL6, DL7, DL8, DL9, DL10, DL11, DL12, DL13	LED-D5
11	5	DL4, DL14, DL15, DL16, DL17	LED-D3
12	8	DZ1, DZ2, DZ5, DZ6, DZ9, DZ10, DZ11, DZ12	12V/1W
13	4	DZ3, DZ4, DZ7, DZ8	5V1/1W
14	15	D1, D4, D5, D7, D8, D10, D11, D13, D14, D15, D16, D17, D18, D19, D20	BAV99B
15	1	D3	LM4040-5V-1%
16	4	D6, D21, D22, D23	TMMBAT48
17	3	FIX1, FIX2, FIX3	FIX35
18	1	JP1	STRIP 2
19	1	JP2	STRIP 5X2
20	3	JP3, JP4, JP6	JUMPER 2
21	1	JP7	JUMPER-2
22	1	J1	BDM
23	2	J2, J3	CON26AP
24	1	J4	CON34A
25	1	J5	CON10AP

26	4	K1, K2, K3, K4	FTR-B3-GA-012
27	24	OC1, OC2, OC3, OC4, OC5, OC6, OC7, OC8, OC9, OC10, OC11, OC12, OC13, OC14, OC15, OC16, OC17, OC18, OC19, OC20, OC21, OC22, OC23, OC24	K10102A SMD
28	1	Q1	FDN337N
29	2	Q2, Q3	BC237
30	2	R1, R108	1M
31	61	R2, R6, R7, R8, R9, R10, R13, R14, R15, R16, R17, R18, R19, R20, R21, R22, R23, R24, R25, R26, R27, R28, R29, R31, R32, R33, R34, R51, R87, R88, R89, R101, R103, R106, R124, R137, R149, R159, R172, R173, R181, R184, R185, R187, R194, R195, R203, R226, R227, R228, R229, R230, R231, R232, R233, R234, R238, R242, R243, R245, R248	10K
32	27	R3, R35, R38, R42, R45, R50, R52, R54, R60, R61, R65, R66, R71, R73, R77, R80, R84, R90, R93, R98, R102, R107, R110, R114, R117, R120, R122	2K2
33	1	R4	87W-20K
34	1	R5	X22R
35	33	R11, R12, R36, R39, R44, R47, R55, R57, R62, R63, R67, R69, R74, R76, R78, R82, R85, R91, R95, R99, R104, R112, R115, R118, R121, R133, R145, R155, R167, R178, R180, R190, R212	47K
36	9	R30, R125, R141, R150, R162, R174, R186, R240, R241	100R
37	40	R37, R40, R41, R43, R46, R48, R49, R53, R56, R58, R59, R64, R68, R70, R72, R75, R79, R83, R86, R92, R96, R100, R105, R109, R113, R116, R119, R123, R130, R138, R144, R154, R163, R169, R175, R198, R219, R220, R221, R222	1K5
38	4	R81, R94, R97, R111	33K
39	58	R126, R127, R128, R129, R131, R132, R135, R136, R139, R140, R142, R143, R147, R148, R151, R152, R153, R157, R158, R160, R161, R165, R166, R170, R171, R176, R177, R182, R183, R188, R189, R192, R193, R196, R197, R199, R200, R201, R202, R204, R205, R206, R207, R208, R209, R210, R211, R213, R214, R215, R216, R217, R218, R224, R225, R237, R246, R247	22R
40	6	R134, R146, R156, R168, R179,	10K5

41	1	R191	
42	1	R164	12K
43	1	R235	220K
44	1	R236	10M
45	2	R239, R244	100K
46	1	R249	18R
47	2	R250, R251	820R
48	11	SC1	5V
49	1	S1, S2, S4, S5, S6, S7, S8, S9, S10, S11, S12	B3F
50	1	S3	SW SPDT
51	1	TP1	TP
52	6	U1	GM24123DSL
53	1	U2, U11, U13, U17, U20, U36	40106
54	1	U3	MC68HC912-D60-CPV8
55	2	U4	74HC244
56	3	U5, U8	74HC139
57	1	U6, U7, U9	74LS273
58	3	U16	LM258
59	5	U21, U24, U27	TL072
60	3	U22, U26, U30, U32, U37	ULN2004A
61	2	U23, U25, U28	TLV5626
62	1	U29, U31	SN75176AP
63	1	U33	LM7805/TO220
64	1	U34	74HC157
65	1	U35	ICL232
66	1	U38	MC33064D-5R2G
67	1	U40	CD68HC68T1M
68	1	VR1	LM317LD13TR
69	1	Y1	14.745MHz
		Y2	IQDLFA103D

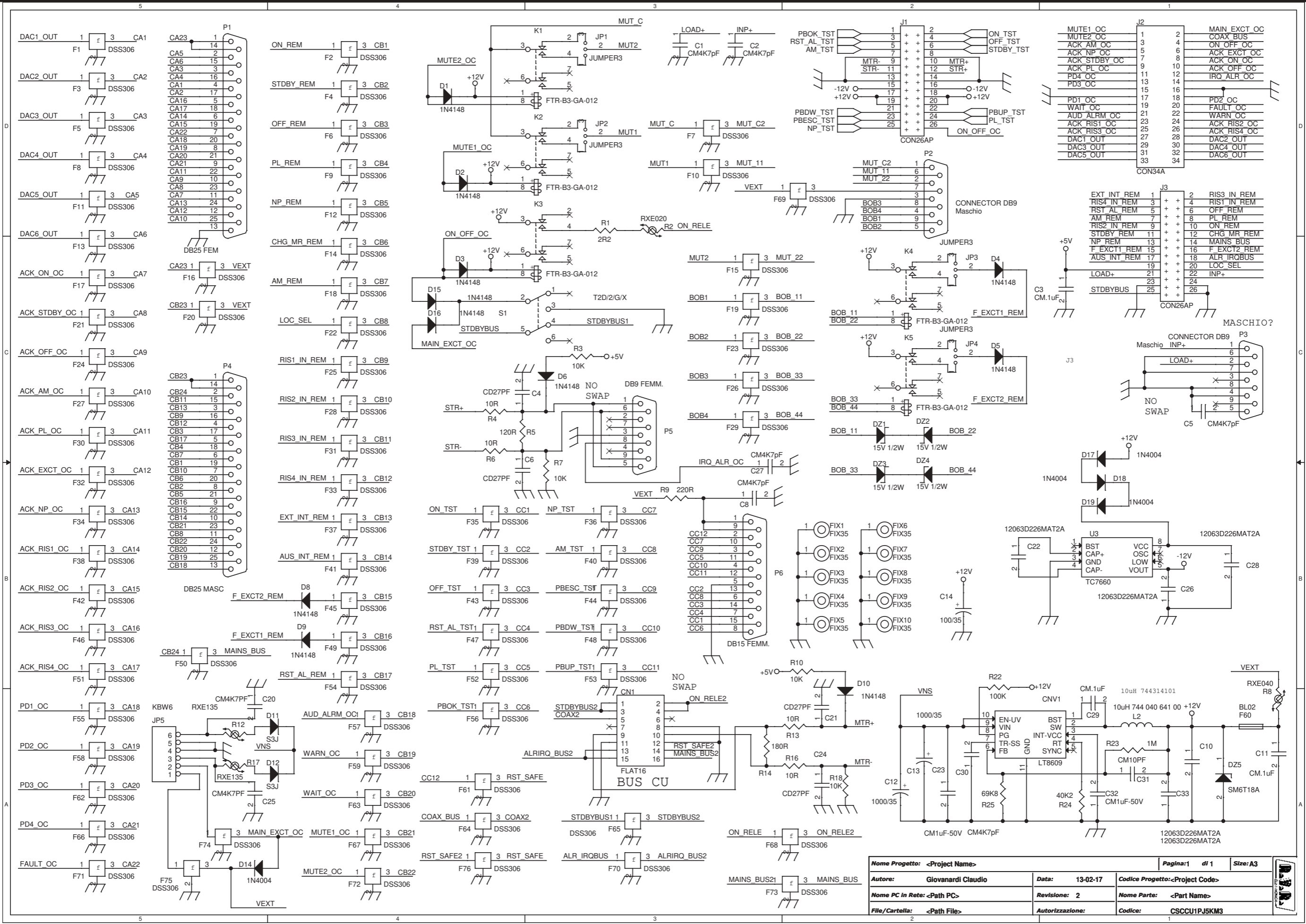


### Motherboard control unit (SLCCU1PJ5KM3)



ATTENZIONE MONTARE FLAT  
TRANSITION

ARCHIVIO: X:\WORKDWG\	
TITLE	PIANO DI MONTAGGIO CCU1
DOCUMENT NUMBER	CSCCU1PJ5KM3_MNT. DWG REV 3
DATE:	29 MARZO 2017



Nome Progetto: <Project Name>		Pagina: 1 di 1		Size: A3	
Autore: Giovanardi Claudio	Data: 13-02-17	Codice Progetto: <Project Code>			
Nome PC in Rete: <Path PC>		Revisione: 2	Nome Parte: <Part Name>		
File/Cartella: <Path File>	Autorezzazione:	Codice: CSCCU1PJ5KM3			

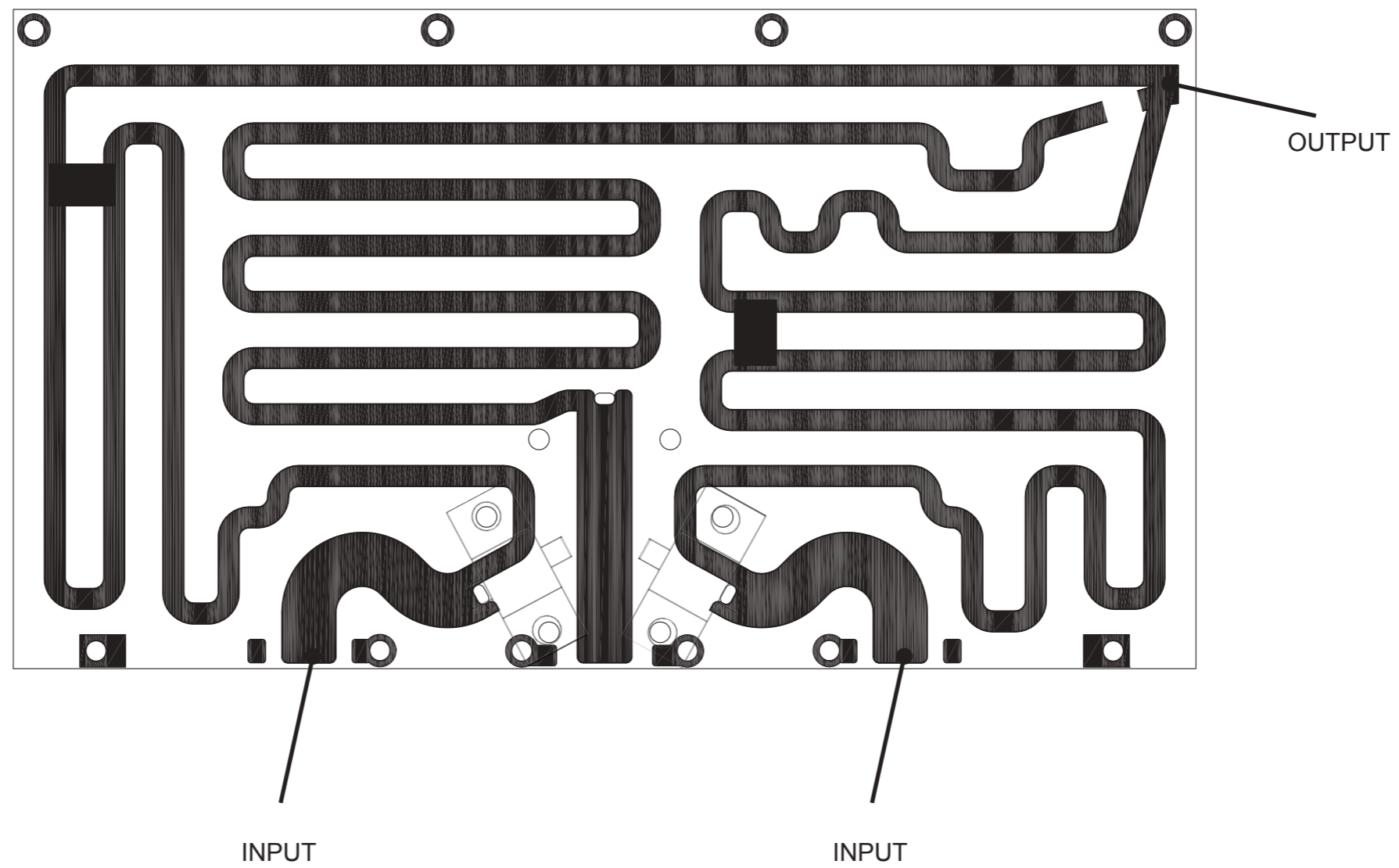
Revised: Wednesday, August 02, 2017  
Revision:

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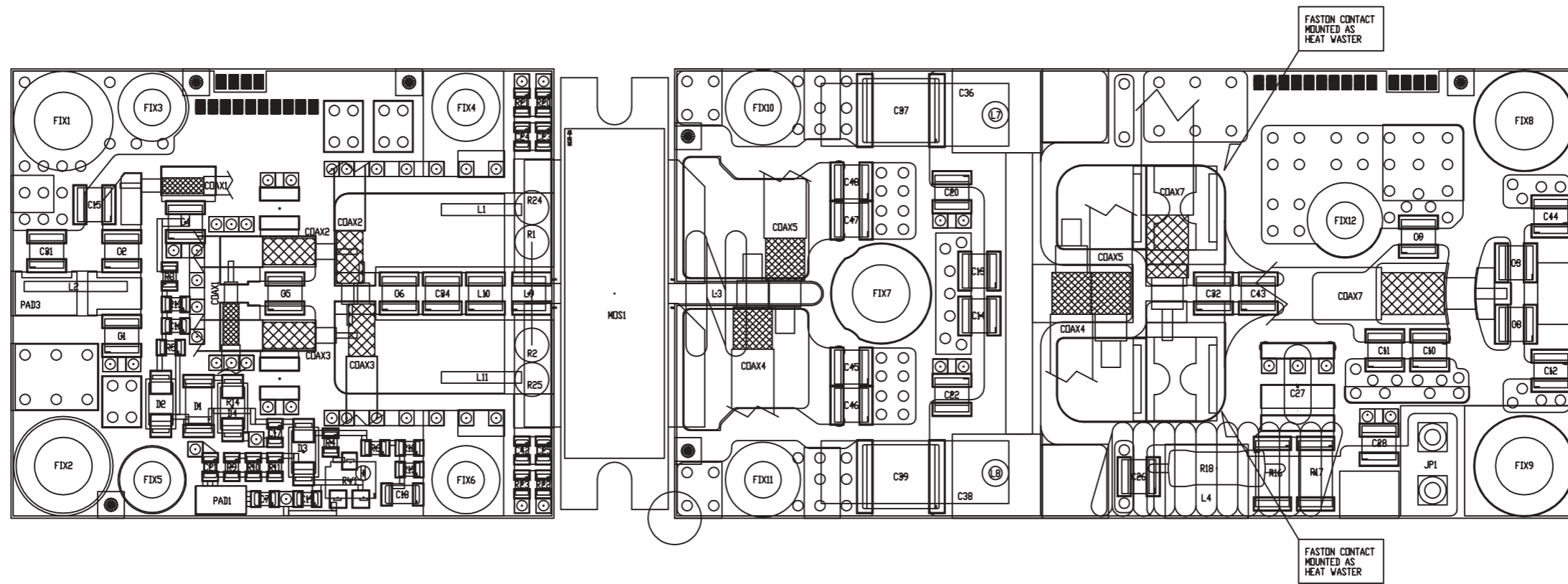
Item	Quantity	Reference	Part
1	1	CNV1	LT8609
2	1	CN1	FLAT16
3	8	C1,C2,C5,C8,C20,C25,C27,C30	CM4K7pF
4	3	C3,C11,C29	CM.1uF
5	4	C4,C6,C21,C24	CD27PF
6	5	C10,C22,C26,C28,C33	12063D226MAT2A
7	2	C12,C13	1000/35
8	1	C14	100/35
9	2	C23,C32	CM1uF-50V
10	1	C31	CM10PF
11	4	DZ1,DZ2,DZ3,DZ4	15V 1/2W
12	1	DZ5	SM6T18A
13	11	D1,D2,D3,D4,D5,D6,D8,D9,D10,D15,D16	1N4148
14	2	D11,D12	S3J
15	4	D14,D17,D18,D19	1N4004
16	10	FIX1,FIX2,FIX3,FIX4,FIX5,FIX6,FIX7,FIX8,FIX9,FIX10	FIX35
17	75	F1,F2,F3,F4,F5,F6,F7,F8,F9,F10,F11,F12,F13,F14,F15,F16,F17,F18,F19,F20,F21,F22,F23,F24,F25,F26,F27,F28,F29,F30,F31,F32,F33,F34,F35,F36,F37,F38,F39,F40,F41,F42,F43,F44,F45,F46,F47,F48,F49,F50,F51,F52,F53,F54,F55,F56,F57,F58,F59,F61,F62,F63,F64,F65,F66,F67,F68,F69,F70,F71,F72,F73,F74,F75,F76	DSS306
18	1	F60	BL02
19	4	JP1,JP2,JP3,JP4	JUMPER3
20	1	JP5	KBW6
21	2	J1,J3	CON26AP
22	1	J2	CON34A
23	5	K1,K2,K3,K4,K5	FTR-B3-GA-012
24	1	L2	10uH 744 040 641 00
25	1	P1	DB25 FEM
26	2	P2,P3	CONNECTOR DB9
27	1	P4	DB25 MASC

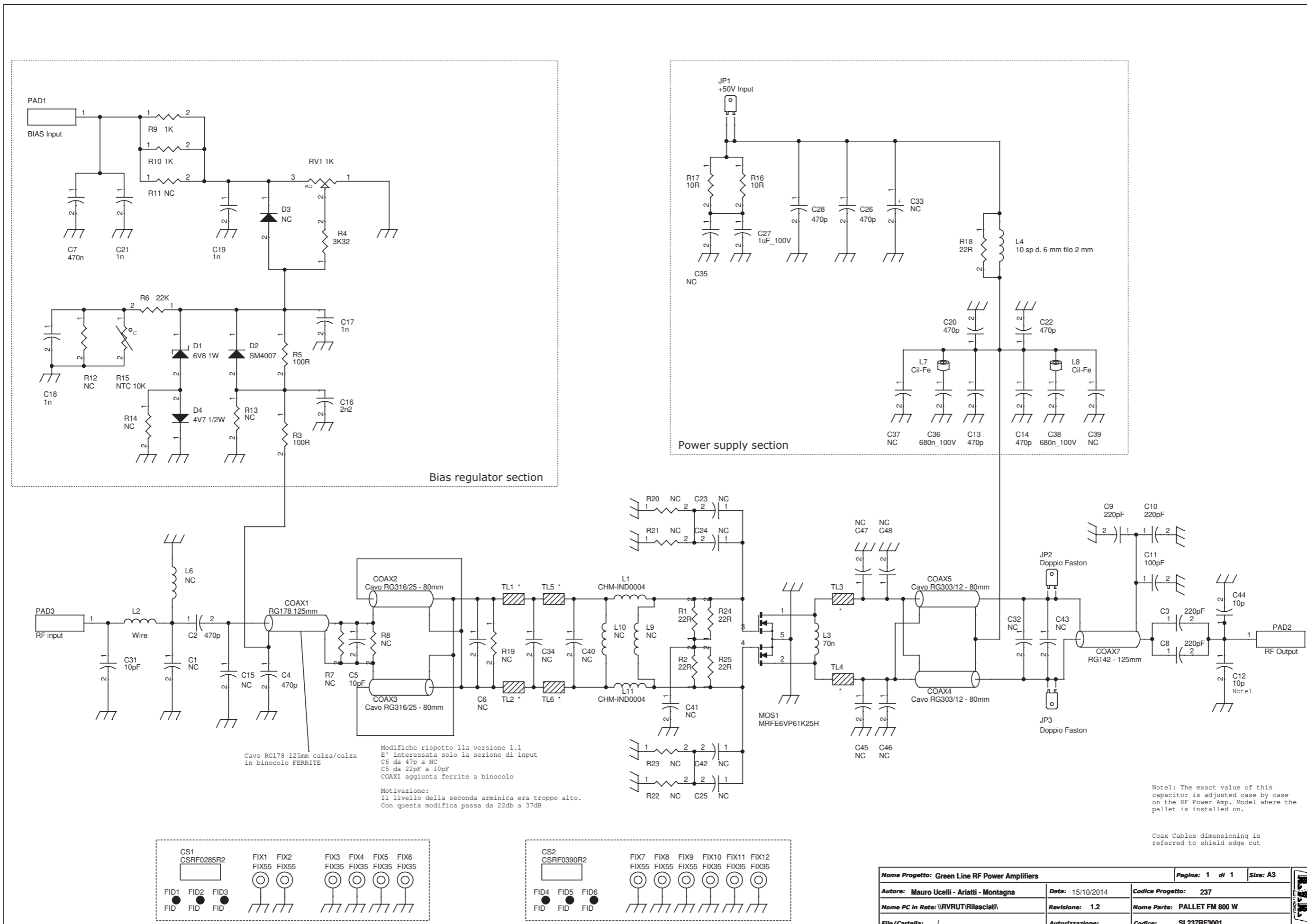
28	1	P5	DB9 FEMM.
29	1	P6	DB15 FEMM.
30	1	R1	2R2
31	1	R2	RXE020
32	4	R3,R7,R10,R18	10K
33	4	R4,R6,R13,R16	10R
34	1	R5	120R
35	1	R8	RXE040
36	1	R9	220R
37	2	R12,R17	RXE135
38	1	R14	180R
39	1	R22	100K
40	1	R23	1M
41	1	R24	40K2
42	1	R25	69K8
43	1	S1	T2D/2/G/X
44	1	U3	TC7660

2-way combiner (CSCMBMOD2KPJ2)



Pallet mosfet (KKFIN237N)





PALLET FM 800 W Revised: Wednesday, October 15, 2014  
 SL237RF3001 Revision: 1.2  
 Green Line RF Power Amplifiers  
 Mauro Ucelli - Ariatti - Montagna

Item	Q.ty	Reference	Part	Description	Code1	Code2
1	1	COAX1	RG178 125mm	Cavo RG178 125mm calza/calza in binocolo isolante	CAVRG178	Inp
2	2	COAX2,COAX3	Cavo RG316/25 - 80mm	Cavo RG316/25 80mm calza/calza	CAVRG316/25	Inp
3	2	COAX4,COAX5	Cavo RG303/12 - 80mm	Cavo RG303/12.5 80mm calza/calza	CAVRG303/12	Out
4	1	COAX7	RG142 - 125mm	Cavo RG142 125mm calza/calza	CAVRG142	Out
5	1	CS1	CSRF0285R2	Circuito stampato	CSRF0285R2	Inp
6	1	CS2	CSRF0390R2	Circuito stampato	CSRF0390R2	Out
7	5	C1,C6,C15,C34,C40	NC	Cond. SMD 1212 HQ		Inp
8	2	C2,C4	470p	Cond. SMD 1212 HQ	CHQ471JA201	Inp
9	4	C3,C8,C9,C10	220pF	Cond. SMD 1212 HQ	CHQ221JA201	Out
10	1	C5,C31	10p	Cond. SMD 1212 HQ	CHQ100CA501	Inp
11	1	C7	470n	Cond. SMD 0805	CCC085474KXB	Inp
12	1	C11	100pF	Cond. SMD 1212 HQ	CHQ101JA501	Out
13	2	C12,C44	10p	Cond. SMD 1212 HQ	CHQ100CA501	Out
14	6	C13,C14,C20,C22,C26,C28	470p	Cond. SMD 1212 HQ	CHQ471JA201	Out
15	1	C16	2n2	Cond. SMD 0805 COG	CCC085222GCC	Inp
16	3	C17,C19,C21	1n	Cond. SMD 0805	CCC085102JNC	Inp
17	1	C18	1n	Cond. SMD 1206	CCC126102KXC	Inp
18	4	C23,C24,C25,C42	NC	Cond. SMD 0805		Inp
19	1	C27	1uF_100V	Cond. multistrato p 5mm	CMS105MC101	Inp
20	6	C32,C43,C45,C46,C47,C48	NC	Cond. SMD 1212 HQ		Out
21	1	C33	NC	Cond. Elettr. Dia 5 P2.54 105° Low ESR		Out
22	3	C35,C37,C39	NC	Cond. Poliestere p 15mm		Out
23	2	C36,C38	680n_100V	Cond. Poliestere p 15mm	CPE684KE101	Out
24	1	C41	NC	Cond. multistrato p 5mm		Inp
25	1	D1	6V8 1W	MELF SMD Zener Diode	DIZ6V8MELF	Inp
26	1	D2	SM4007	Diode SMD cont. SMA	DIS4007SMA	Inp
27	1	D3	NC	Diode SMD cont. SMA		Inp
28	1	D4	4V7 1/2W	Diode SMD cont. SMA	DIZ4V7MINI	Inp
29	3	FID1,FID2,FID3	FID	Fiducial CS		Inp
30	3	FID4,FID5,FID6	FID	Fiducial CS		Out
31	2	FIX1,FIX2	FIX55	Foro fissaggio 5.5mm		Inp
32	4	FIX3,FIX4,FIX5,FIX6	FIX35	Foro fissaggio 3.5mm		Inp
33	3	FIX7,FIX8,FIX9	FIX55	Foro fissaggio 5.5mm		Out
34	3	FIX10,FIX11,FIX12	FIX35	Foro fissaggio 3.5mm		Out
35	1	JP1	+50V Input	Faston da CS p. 5.08	CNTFSTMSCS	Out
36	2	JP2,JP3	Doppio Faston		CNTFSTMD3CSA	
37	2	L1,L11	CHM-IND0004	Printed link on copper	PMINDFIN237B	Inp
38	1	L2	Wire	Filo R. Arg. 1mm lung. 10mm	FILARGE0001	Inp
39	1	L3	70n	1.5 Spire Filo R. Arg. 2mm Avvolte su 8mm Lung. 8 Alt. 5mm da PCB	BOB01020155A	Out
40	1	L4	10 sp d. 6 mm filo 2 mm	6spire filo R. Smalt. 0.8mm Avvolte su 4.5mm lung. 12mm includente R18 all'interno	BOB01010005A	Out
41	1	L6	NC	3spire filo R. Arg.1mm avvolte su 4.5mm lung. 5mm		Inp
42	2	L7,L8	Cil-Fe	Cilindretto di ferrite	FTRPERLINA	Out
43	1	L9	NC			
44	1	L10	NC	Ind. SMD 1008		Inp
45	1	MOS1	MRFE6VP61K25H	PP Power mosfet RF	TRNMRFE6VP61K25HR6	
46	1	PAD1	BIAS Input			
47	1	PAD2	RF Output			
48	1	PAD3	RF input			
49	1	RV1	1K	Trimm. multi SMD PVG5 Murata	RVTMLK0001VS	Inp
50	4	R1,R2,R24,R25	22R	Res. 2W	RSM002J0022H	Inp
51	2	R3,R5	100R	Res. SMD 0805 1%	RCH085F0100H	Inp
52	1	R4	3K32	Res. SMD 0805 1%	RCH085F03K32	Inp
53	1	R6	22K	Res. SMD 0805 1%	RCH085F0022K	Inp
54	3	R7,R8,R19	NC	Res. 2W	RSC002J	Inp
55	2	R9,R10	1K	Res. SMD 0805 1%	RCH085F0001K	Inp
56	7	R11,R12,R13,R20,R21,R22,R23	NC	Res. SMD 0805 1%	RCH085F	Inp
57	1	R14	NC	Res. SMD 1206 1%	RCH085F	Inp
58	1	R15	NTC 10K	Res. NTC passo 5mm	RNTC085K103K	Inp
59	2	R16,R17	10R	Res. SMD 2512 5%	RCH252J0010H	Out
60	1	R18	22R	Res. 2W	RSM002J0022H	Out
61	4	TL1,TL2,TL5,TL6	*	Linea strip CS		Inp
62	2	TL3,TL4	*	Linea strip CS		Out

**Datasheet of MRF6VP11KHR6**

 Freescale Semiconductor  
 Technical Data

 Document Number: MRFE6VP61K25H  
 Rev. 4.1, 3/2014

**RF Power LDMOS Transistors**

 High Ruggedness N-Channel  
 Enhancement-Mode Lateral MOSFETs

These high ruggedness devices are designed for use in high VSWR industrial (including laser and plasma exciters), broadcast (analog and digital), aerospace and radio/land mobile applications. They are unmatched input and output designs allowing wide frequency range utilization, between 1.8 and 600 MHz.

- Typical Performance:  $V_{DD} = 50$  Volts,  $I_{DQ} = 100$  mA

Signal Type	$P_{out}$ (W)	f (MHz)	$G_{ps}$ (dB)	$\eta_D$ (%)
Pulse (100 $\mu$ sec, 20% Duty Cycle)	1250 Peak	230	24.0	74.0
CW	1250 CW	230	22.9	74.6

**Application Circuits (1) — Typical Performance**

Frequency (MHz)	Signal Type	$P_{out}$ (W)	$G_{ps}$ (dB)	$\eta_D$ (%)
27	CW	1300	27	81
40	CW	1300	26	85
81.36	CW	1250	27	84
87.5-108	CW	1100	24	80
144-148	CW	1250	26	78
170-230	DVB-T	225	25	30
352	Pulse (200 $\mu$ sec, 20% Duty Cycle)	1250	21.5	66
352	CW	1150	20.5	68
500	CW	1000	18	58

1. Contact your local Freescale sales office for additional information on specific circuit designs.

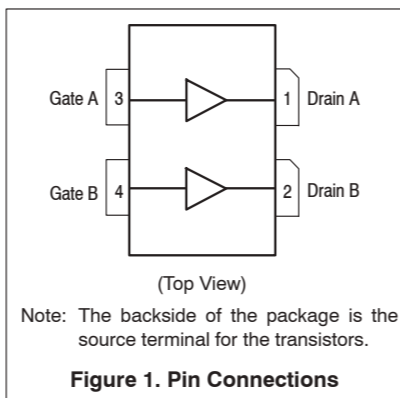
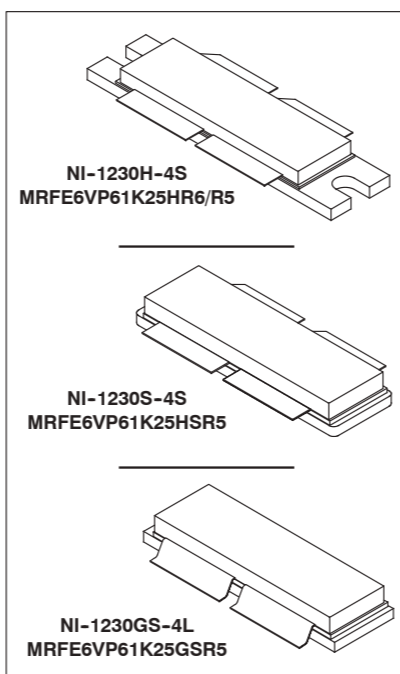
**Load Mismatch/Ruggedness**

Frequency (MHz)	Signal Type	VSWR	$P_{out}$ (W)	Test Voltage	Result
230	Pulse (100 $\mu$ sec, 20% Duty Cycle)	> 65:1 at all Phase Angles	1500 Peak (3 dB Overdrive)	50	No Device Degradation

**Features**

- Unmatched Input and Output Allowing Wide Frequency Range Utilization
- Device can be used Single-Ended or in a Push-Pull Configuration
- Qualified Up to a Maximum of 50  $V_{DD}$  Operation
- Characterized from 30 V to 50 V for Extended Power Range
- Suitable for Linear Application with Appropriate Biasing
- Integrated ESD Protection with Greater Negative Gate-Source Voltage Range for Improved Class C Operation
- Characterized with Series Equivalent Large-Signal Impedance Parameters
- In Tape and Reel. R6 Suffix = 150 Units, 56 mm Tape Width, 13-inch Reel. R5 Suffix = 50 Units, 56 mm Tape Width, 13-inch Reel.

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**MRFE6VP61K25HR6**  
**MRFE6VP61K25HR5**  
**MRFE6VP61K25HSR5**  
**MRFE6VP61K25GSR5**
**1.8-600 MHz, 1250 W CW, 50 V**  
**WIDEBAND**  
**RF POWER LDMOS TRANSISTORS**

**Table 1. Maximum Ratings**

Rating	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	-0.5, +133	Vdc
Gate-Source Voltage	$V_{GS}$	-6.0, +10	Vdc
Storage Temperature Range	$T_{stg}$	-65 to +150	$^{\circ}$ C
Case Operating Temperature	$T_C$	150	$^{\circ}$ C
Operating Junction Temperature (1,2)	$T_J$	225	$^{\circ}$ C
Total Device Dissipation @ $T_C = 25^{\circ}$ C Derate above $25^{\circ}$ C	$P_D$	1333 6.67	W W/ $^{\circ}$ C

**Table 2. Thermal Characteristics**

Characteristic	Symbol	Value (2,3)	Unit
Thermal Resistance, Junction to Case CW: Case Temperature $63^{\circ}$ C, 1250 W CW, $I_{DQ} = 100$ mA, 230 MHz	$R_{\theta JC}$	0.15	$^{\circ}$ C/W
Thermal Impedance, Junction to Case Pulse: Case Temperature $66^{\circ}$ C, 1250 W Pulse, 100 $\mu$ sec Pulse Width, 20% Duty Cycle, $I_{DQ} = 100$ mA, 230 MHz	$Z_{\theta JC}$	0.03	$^{\circ}$ C/W

**Table 3. ESD Protection Characteristics**

Test Methodology	Class
Human Body Model (per JESD22-A114)	2, passes 3500 V
Machine Model (per EIA/JESD22-A115)	B, passes 250 V
Charge Device Model (per JESD22-C101)	IV, passes 4000 V

**Table 4. Electrical Characteristics** ( $T_A = 25^{\circ}$ C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>Off Characteristics (4)</b>					
Gate-Source Leakage Current ( $V_{GS} = 5$ Vdc, $V_{DS} = 0$ Vdc)	$I_{GSS}$	—	—	1	$\mu$ Adc
Drain-Source Breakdown Voltage ( $V_{GS} = 0$ Vdc, $I_D = 100$ mA)	$V_{(BR)DSS}$	133	—	—	Vdc
Zero Gate Voltage Drain Leakage Current ( $V_{DS} = 50$ Vdc, $V_{GS} = 0$ Vdc)	$I_{DSS}$	—	—	10	$\mu$ Adc
Zero Gate Voltage Drain Leakage Current ( $V_{DS} = 100$ Vdc, $V_{GS} = 0$ Vdc)	$I_{DSS}$	—	—	20	$\mu$ Adc
<b>On Characteristics</b>					
Gate Threshold Voltage (4) ( $V_{DS} = 10$ Vdc, $I_D = 1776$ $\mu$ Adc)	$V_{GS(th)}$	1.7	2.2	2.7	Vdc
Gate Quiescent Voltage ( $V_{DD} = 50$ Vdc, $I_D = 100$ mAdc, Measured in Functional Test)	$V_{GS(Q)}$	1.9	2.2	2.9	Vdc
Drain-Source On-Voltage (4) ( $V_{GS} = 10$ Vdc, $I_D = 2$ Adc)	$V_{DS(on)}$	—	0.15	—	Vdc
Forward Transconductance ( $V_{DS} = 10$ Vdc, $I_D = 30$ Adc)	$g_{fs}$	—	28.0	—	S
<b>Dynamic Characteristics (4)</b>					
Reverse Transfer Capacitance ( $V_{DS} = 50$ Vdc $\pm$ 30 mV(rms)ac @ 1 MHz, $V_{GS} = 0$ Vdc)	$C_{rss}$	—	2.8	—	pF
Output Capacitance ( $V_{DS} = 50$ Vdc $\pm$ 30 mV(rms)ac @ 1 MHz, $V_{GS} = 0$ Vdc)	$C_{oss}$	—	185	—	pF
Input Capacitance ( $V_{DS} = 50$ Vdc, $V_{GS} = 0$ Vdc $\pm$ 30 mV(rms)ac @ 1 MHz)	$C_{iss}$	—	562	—	pF

- Continuous use at maximum temperature will affect MTTF.
- MTTF calculator available at <http://www.freescale.com/rf>. Select Software & Tools/Development Tools/Calculators to access MTTF calculators by product.
- Refer to AN1955, *Thermal Measurement Methodology of RF Power Amplifiers*. Go to <http://www.freescale.com/rf>. Select Documentation/Application Notes - AN1955.
- Each side of device measured separately.

(continued)

**MRFE6VP61K25HR6 MRFE6VP61K25HR5 MRFE6VP61K25HSR5 MRFE6VP61K25GSR5**

 RF Device Data  
 Freescale Semiconductor, Inc.



**Table 4. Electrical Characteristics** ( $T_A = 25^\circ\text{C}$  unless otherwise noted) (continued)

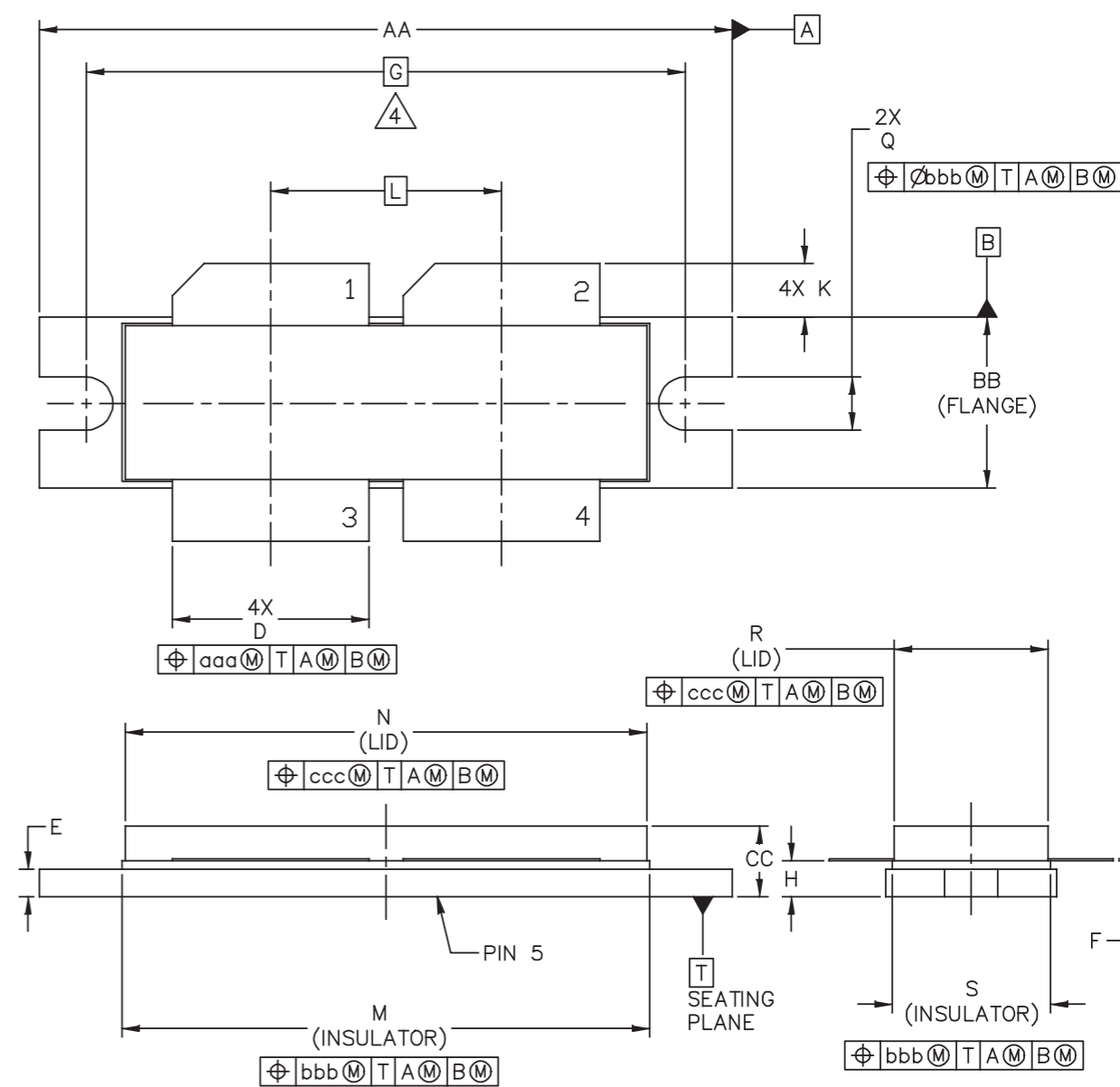
Characteristic	Symbol	Min	Typ	Max	Unit
<b>Functional Tests</b> <sup>(1)</sup> (In Freescale Test Fixture, 50 ohm system) $V_{DD} = 50\text{ Vdc}$ , $I_{DQ} = 100\text{ mA}$ , $P_{out} = 1250\text{ W Peak}$ (250 W Avg.), $f = 230\text{ MHz}$ , 100 $\mu\text{sec}$ Pulse Width, 20% Duty Cycle					
Power Gain	$G_{ps}$	23.0	24.0	26.0	dB
Drain Efficiency	$\eta_D$	72.5	74.0	—	%
Input Return Loss	IRL	—	-14	-10	dB

**Table 5. Load Mismatch/Ruggedness** (In Freescale Test Fixture, 50 ohm system)  $I_{DQ} = 100\text{ mA}$

Frequency (MHz)	Signal Type	VSWR	$P_{out}$ (W)	Test Voltage, $V_{DD}$	Result
230	Pulse (100 $\mu\text{sec}$ , 20% Duty Cycle)	> 65:1 at all Phase Angles	1500 Peak (3 dB Overdrive)	50	No Device Degradation

1. Measurements made with device in straight lead configuration before any lead forming operation is applied. Lead forming is used for gull wing (GS) parts.

**PACKAGE DIMENSIONS**



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TITLE: NI-1230-4H	DOCUMENT NO: 98ASB16977C	REV: F
	STANDARD: NON-JEDEC	
		28 FEB 2013

MRFE6VP61K25HR6 MRFE6VP61K25HR5 MRFE6VP61K25HSR5 MRFE6VP61K25GSR5

MRFE6VP61K25HR6 MRFE6VP61K25HR5 MRFE6VP61K25HSR5 MRFE6VP61K25GSR5

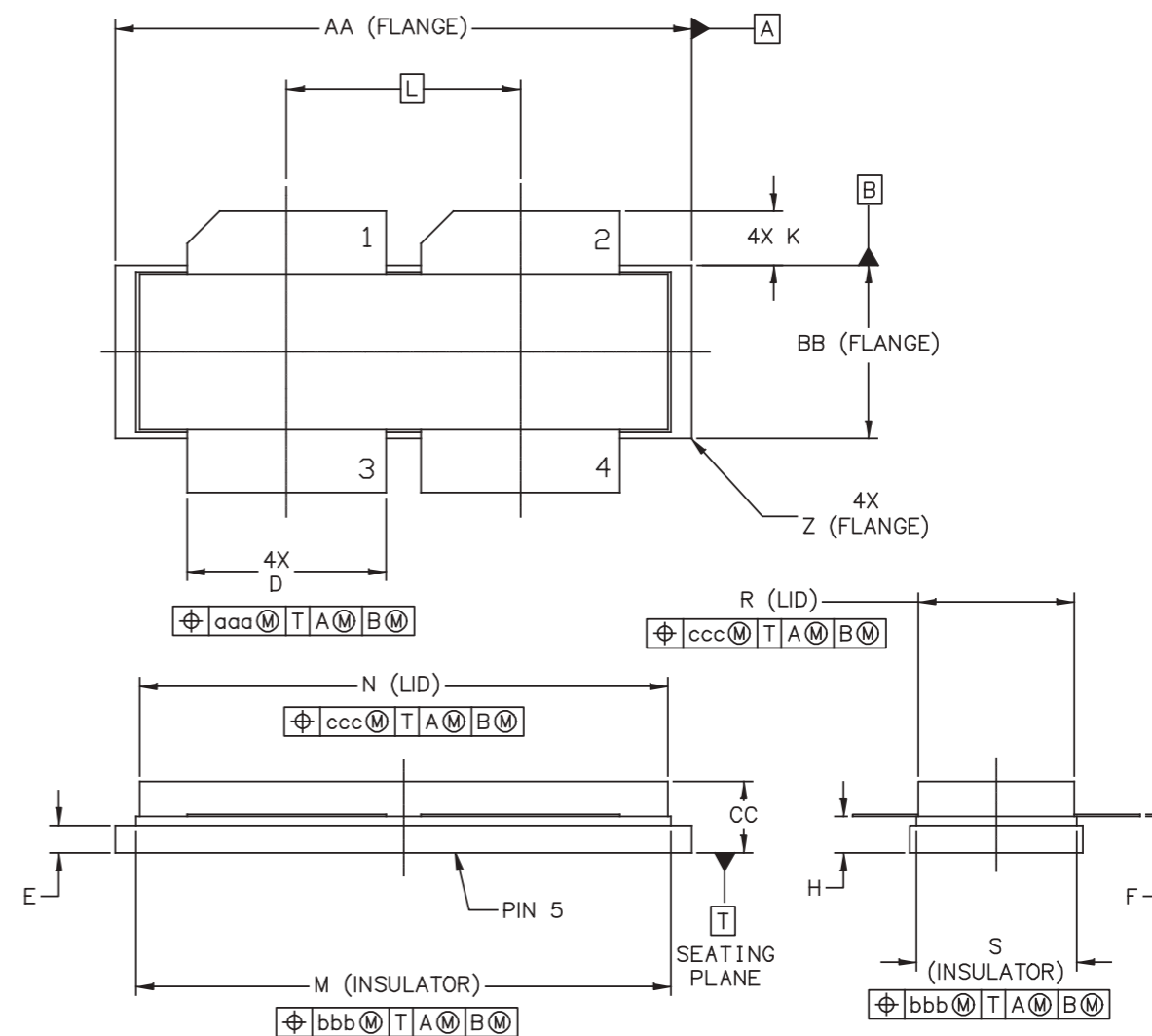


NOTES:

1. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
2. CONTROLLING DIMENSION: INCH
3. DIMENSION H IS MEASURED .030 INCH (0.762 MM) AWAY FROM PACKAGE BODY.
4. RECOMMENDED BOLT CENTER DIMENSION OF 1.52 INCH (38.61 MM) BASED ON M3 SCREW.

DIM	INCH		MILLIMETER		DIM	INCH		MILLIMETER	
	MIN	MAX	MIN	MAX		MIN	MAX	MIN	MAX
AA	1.615	1.625	41.02	41.28	N	1.218	1.242	30.94	31.55
BB	.395	.405	10.03	10.29	Q	.120	.130	3.05	3.30
CC	.170	.190	4.32	4.83	R	.355	.365	9.02	9.27
D	.455	.465	11.56	11.81	S	.365	.375	9.27	9.53
E	.062	.066	1.57	1.68					
F	.004	.007	0.10	0.18					
G	1.400 BSC		35.56 BSC		aaa	.013		0.33	
H	.082		2.08		bbb	.010		0.25	
K	.117		2.97		ccc	.020		0.51	
L	.540 BSC		13.72 BSC						
M	1.219	1.241	30.96	31.52					

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		REV: G
		STANDARD: NON-JEDEC
		01 MAR 2013

MRFE6VP61K25HR6 MRFE6VP61K25HR5 MRFE6VP61K25HSR5 MRFE6VP61K25GSR5

MRFE6VP61K25HR6 MRFE6VP61K25HR5 MRFE6VP61K25HSR5 MRFE6VP61K25GSR5

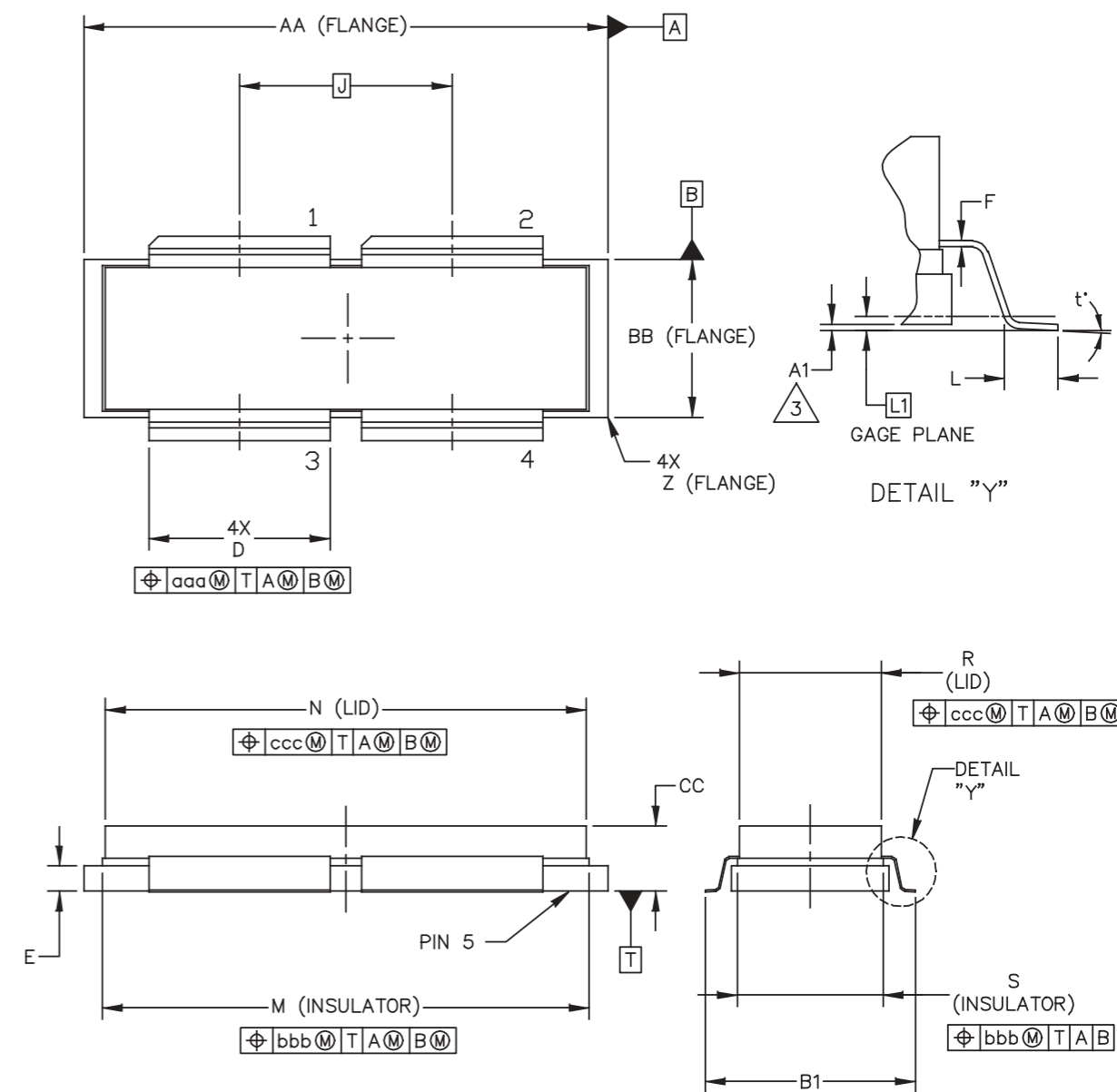


NOTES:

1. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
2. CONTROLLING DIMENSION: INCH
3. DIMENSION H IS MEASURED .030 INCH (0.762 MM) AWAY FROM PACKAGE BODY

DIM	INCHES		MILLIMETERS		DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX		MIN	MAX	MIN	MAX
AA	1.265	1.275	32.13	32.39	R	.355	.365	9.02	9.27
BB	.395	.405	10.03	10.29	S	.365	.375	9.27	9.53
CC	.170	.190	4.32	4.83	Z	R.000	R.040	R0.00	R1.02
D	.455	.465	11.56	11.81					
E	.062	.066	1.57	1.68	aaa	.013		0.33	
F	.004	.007	0.10	0.18	bbb	.010		0.25	
H	.082	.090	2.08	2.29	ccc	.020		0.51	
K	.117	.137	2.97	3.48					
L	.540 BSC		13.72 BSC						
M	1.219	1.241	30.96	31.52					
N	1.218	1.242	30.94	31.55					

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TITLE: NI-1230-4S GULL	DOCUMENT NO: 98ASA00459D	REV: A
	STANDARD: NON-JEDEC	
	07 MAR 2013	

MRFE6VP61K25HR6 MRFE6VP61K25HR5 MRFE6VP61K25HSR5 MRFE6VP61K25GSR5

MRFE6VP61K25HR6 MRFE6VP61K25HR5 MRFE6VP61K25HSR5 MRFE6VP61K25GSR5



NOTES:

1. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M–1994.
2. CONTROLLING DIMENSION: INCH
3. DIMENSION A1 IS MEASURED WITH REFERENCE TO DATUM T. THE POSITIVE VALUE IMPLIES THAT THE PACKAGE BOTTOM IS HIGHER THAN THE LEAD BOTTOM.

DIM	INCHES		MILLIMETERS		DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX		MIN	MAX	MIN	MAX
AA	1.265	1.275	32.13	32.39	R	.355	.365	9.02	9.27
A1	-.001	.011	-0.03	0.28	S	.365	.375	9.27	9.53
BB	.395	.405	10.03	10.29	Z	R.000	R.040	R0.00	R1.02
B1	.564	.574	14.32	14.58	t*	0*	8*	0*	8*
CC	.170	.190	4.32	4.83					
D	.455	.465	11.56	11.81	aaa	.013		0.33	
E	.062	.066	1.57	1.68	bbb	.010		0.25	
F	.004	.007	0.10	0.18	ccc	.020		0.51	
J	.540 BSC		13.72 BSC						
L	.038	.046	0.97	1.17					
L1	.01 BSC		0.25 BSC						
M	1.219	1.241	30.96	31.52					
N	1.218	1.242	30.94	31.55					
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TITLE: NI-1230-4S GULL					DOCUMENT NO: 98ASA00459D REV: A				
					STANDARD: NON-JEDEC				
					07 MAR 2013				

MRFE6VP61K25HR6 MRFE6VP61K25HR5 MRFE6VP61K25HSR5 MRFE6VP61K25GSR5



PRODUCT DOCUMENTATION AND SOFTWARE

Refer to the following documents and software to aid your design process.

Application Notes

- AN1955: Thermal Measurement Methodology of RF Power Amplifiers

Engineering Bulletins

- EB212: Using Data Sheet Impedances for RF LDMOS Devices

Software

- Electromigration MTTF Calculator
- RF High Power Model
- .s2p File

For Software, do a Part Number search at <http://www.freescale.com>, and select the "Part Number" link. Go to the Software & Tools tab on the part's Product Summary page to download the respective tool.

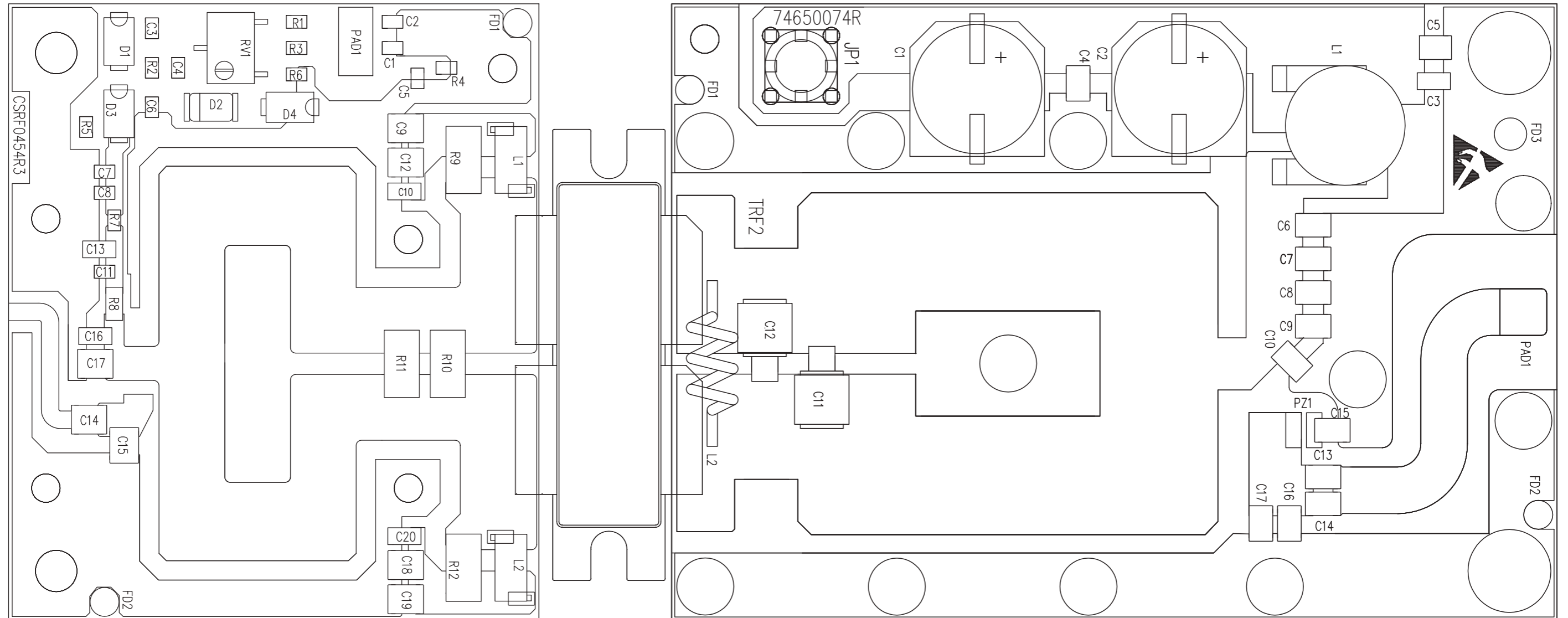
REVISION HISTORY

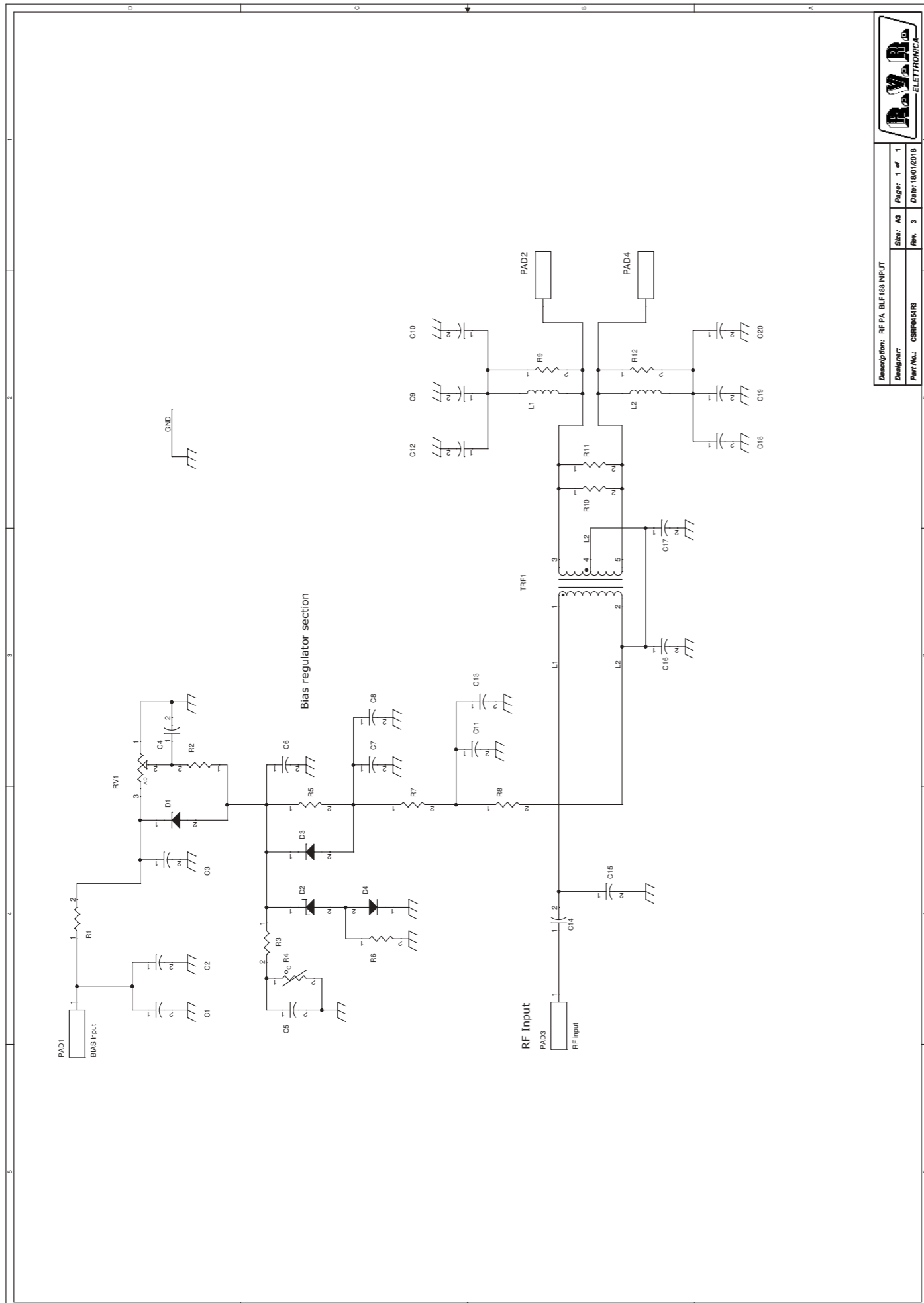
The following table summarizes revisions to this document.

Revision	Date	Description
0	Nov. 2010	• Initial Release of Data Sheet
1	Jan. 2011	• Fig. 1, Pin Connections, corrected pin 4 label from RF <sub>out</sub> /V <sub>GS</sub> to RF <sub>in</sub> /V <sub>GS</sub> , p. 1
2	May 2012	<ul style="list-style-type: none"> <li>• Added Application Circuits Typical Performance table, p. 1</li> <li>• Capable of Handling VSWR bullet: corrected 1250 Peak Output Power value to 1500 and converted to table, pp. 1, 3</li> <li>• Table 1, Max Ratings: final DC test specification for Drain-Source Voltage changed from +125 to +133 Vdc, p. 2</li> <li>• Table 3, ESD Protection Characteristics: added the device's ESD passing level as applicable to each ESD class, p. 2</li> <li>• Table 4, Off Characteristics: final DC test specification for Drain-Source Breakdown Voltage minimum value changed from 125 to 133 Vdc, p. 2</li> <li>• Table 4, On Characteristics: added Forward Transconductance, p. 2</li> <li>• Fig. 10, MTTF versus Junction Temperature – CW: MTTF end temperature on graph changed to match maximum operating junction temperature, p. 7</li> <li>• Added Fig. 12, Source and Load Impedances Optimized for IRL, Power and Efficiency — Push-pull, p. 8</li> <li>• Added Fig. 13, 87.5–108 MHz FM Broadcast Reference Circuit Component Layout, p. 9</li> <li>• Added Table 9, 87.5–108 MHz FM Broadcast Reference Circuit Component Designations and Values, p. 9</li> <li>• Added Fig. 14, 87.5–108 MHz FM Broadband Reference Circuit Schematic, p. 10</li> <li>• Added Fig. 15, Power Gain and Drain Efficiency versus Output Power (87.5–108 MHz), p. 11</li> <li>• Added Fig. 16, Series Equivalent 87.5–108 MHz FM Broadcast Reference Circuit Source and Load Impedance, p. 11</li> <li>• Added Fig. 17, 144–148 MHz Reference Circuit Component Layout, p. 12</li> <li>• Added Table 9, 144–148 MHz Reference Circuit Component Designations and Values, p. 12</li> <li>• Added Fig. 18, 144–148 MHz Reference Circuit Schematic, p. 13</li> <li>• Added Fig. 19, Series Equivalent 144–148 MHz Reference Circuit Source and Load Impedance, p. 14</li> <li>• Added Fig. 20, Power Gain and Drain Efficiency versus Output Power (144–148 MHz), p. 14</li> <li>• Added Fig. 21, Intermodulation Distortion Products versus Output Power (144–148 MHz), p. 14</li> <li>• Added Fig. 22, 144 MHz Harmonics @ 1 kW, p. 15</li> </ul>
3	Oct. 2012	<ul style="list-style-type: none"> <li>• Added part number MRFE6VP61K25GSR5, p. 1</li> <li>• Added 2282-02 (NI-1230S-4 Gull) package isometric, p. 1, and Mechanical Outline, p. 20, 21</li> </ul>
4	Mar. 2013	<ul style="list-style-type: none"> <li>• MRFE6VP61K25HR6 tape and reel option replaced with MRFE6VP61K25HR5 per PCN15551.</li> <li>• Replaced Case Outline 98ASB16977C, Issue E with Issue F, p. 16, 17. Changed dimension C from 0.150"–0.200" to CC 0.170"–0.190".</li> <li>• Replaced Case Outline 98ARB18247C, Issue F with Issue G, p. 18, 19. Changed dimension C from 0.150"–0.200" to CC 0.170"–0.190". Added minimum Z dimension R0.00".</li> <li>• Replaced Case Outline 98ASA00459D, Issue O with Issue A, p. 20, 21. Changed dimension C from 0.150"–0.200" to CC 0.170"–0.190". Corrected positional tolerance for dimension S.</li> </ul>
4.1	Mar. 2014	<ul style="list-style-type: none"> <li>• MRFE6VP61K25HR5 part added to data sheet device box, p. 1</li> <li>• MRFE6VP61K25HSR6 tape and reel option replaced with MRFE6VP61K25HSR5 per PCN15551. (Note: this copy updates the copy from Rev. 4 Revision History to accurately reflect the part number replacement in this data sheet as described in PCN15551.)</li> </ul>

MRFE6VP61K25HR6 MRFE6VP61K25HR5 MRFE6VP61K25HSR5 MRFE6VP61K25GSR5

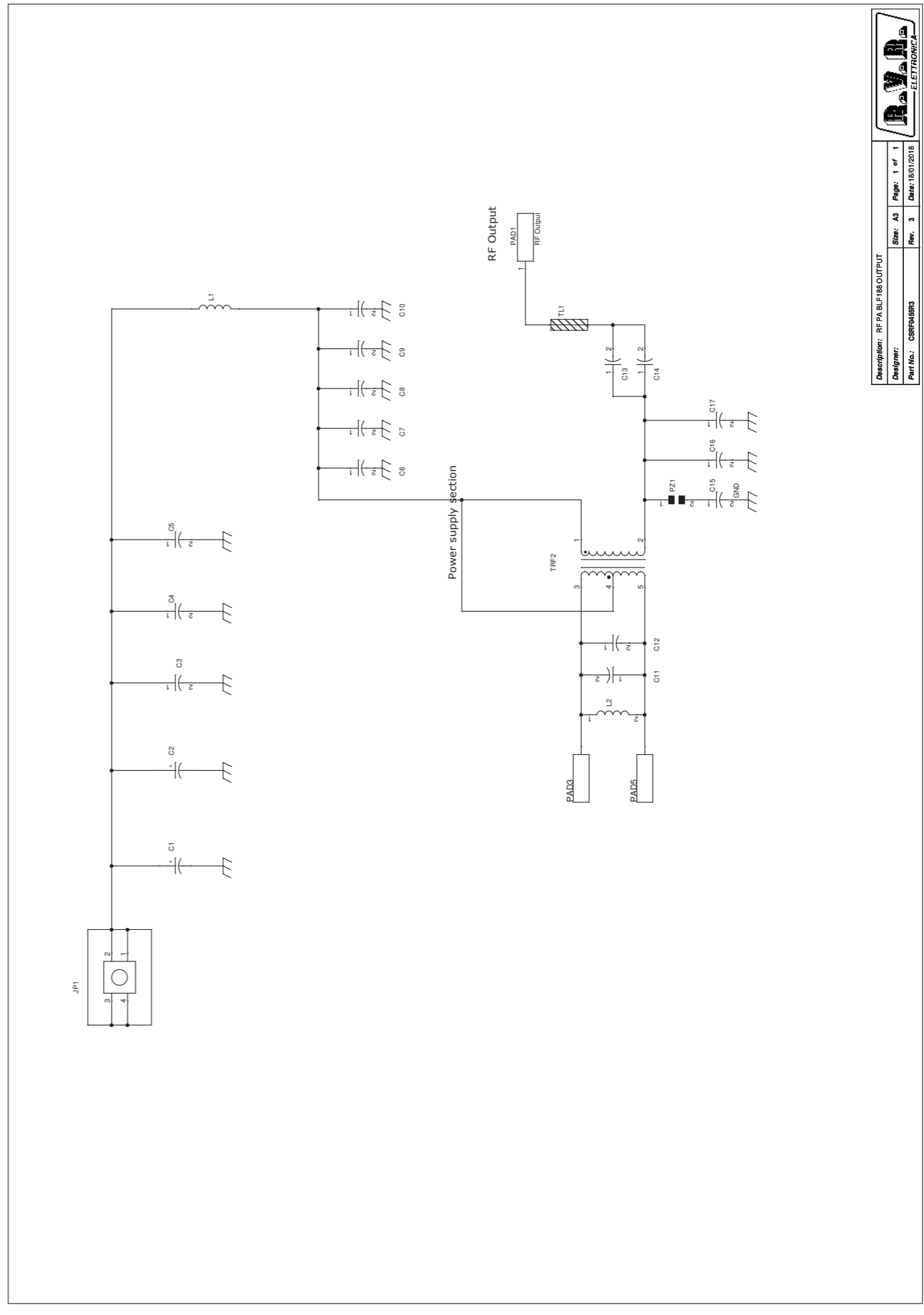
**Planar Pallet mosfet (KKFINPLAN-A)**





Description: RF PA BLF188 INPUT			
Designer:	Size: A3	Page: 1 of 1	
Part No.: CSRPM4SR3	Rev: 3	Date: 18/01/2018	

Description: RF PA BLF188 OUTPUT			
Designer:	Size: A3	Page: 1 of 1	
Part No.: CSRPM4SR3	Rev: 3	Date: 18/01/2018	



**Datasheet of BLF188XR**

# BLF188XR; BLF188XRS

Power LDMOS transistor  
Rev. 6 — 1 September 2015

**AMPLEON**  
Product data sheet

## 1. Product profile

### 1.1 General description

A 1400 W extremely rugged LDMOS power transistor for broadcast and industrial applications in the HF to 600 MHz band.

**Table 1. Application information**

Test signal	f (MHz)	V <sub>DS</sub> (V)	P <sub>L</sub> (W)	G <sub>p</sub> (dB)	η <sub>D</sub> (%)
CW	2 to 30	50	1270	29.0	75
	27	50	1400	23.7	73
	41	50	1200	22.0	82
	60	48	1240	22.0	77
	72.5	50	1350	23.1	83
	81.4	50	1200	27.1	77.8
	88 to 108	50	1320	22.5	85
	108	50	1200	26.5	83
	200	50	1288	19.3	68.3
pulsed RF	81.4	50	1200	25.8	85
	81.4	50	1400	25.4	81
	108	50	1400	24.0	73
DVB-T	174 to 230	50	225	23.8	29

### 1.2 Features and benefits

- Easy power control
- Integrated ESD protection
- Excellent ruggedness
- High efficiency
- Excellent thermal stability
- Designed for broadband operation (HF to 600 MHz)
- Compliant to Directive 2002/95/EC, regarding Restriction of Hazardous Substances (RoHS)

### 1.3 Applications

- Industrial, scientific and medical applications
- Broadcast transmitter applications

AMPLEON

**BLF188XR; BLF188XRS**

Power LDMOS transistor

## 2. Pinning information

**Table 2. Pinning**

Pin	Description	Simplified outline	Graphic symbol
<b>BLF188XR (SOT539A)</b>			
1	drain1		
2	drain2		
3	gate1		
4	gate2		
5	source		
<b>BLF188XRS (SOT539B)</b>			
1	drain1		
2	drain2		
3	gate1		
4	gate2		
5	source		

[1] Connected to flange.

## 3. Ordering information

**Table 3. Ordering information**

Type number	Package		Version
	Name	Description	
BLF188XR	-	flanged balanced ceramic package; 2 mounting holes; 4 leads	SOT539A
BLF188XRS	-	earless flanged balanced ceramic package; 4 leads	SOT539B

## 4. Limiting values

**Table 4. Limiting values**

In accordance with the Absolute Maximum Rating System (IEC 60134).

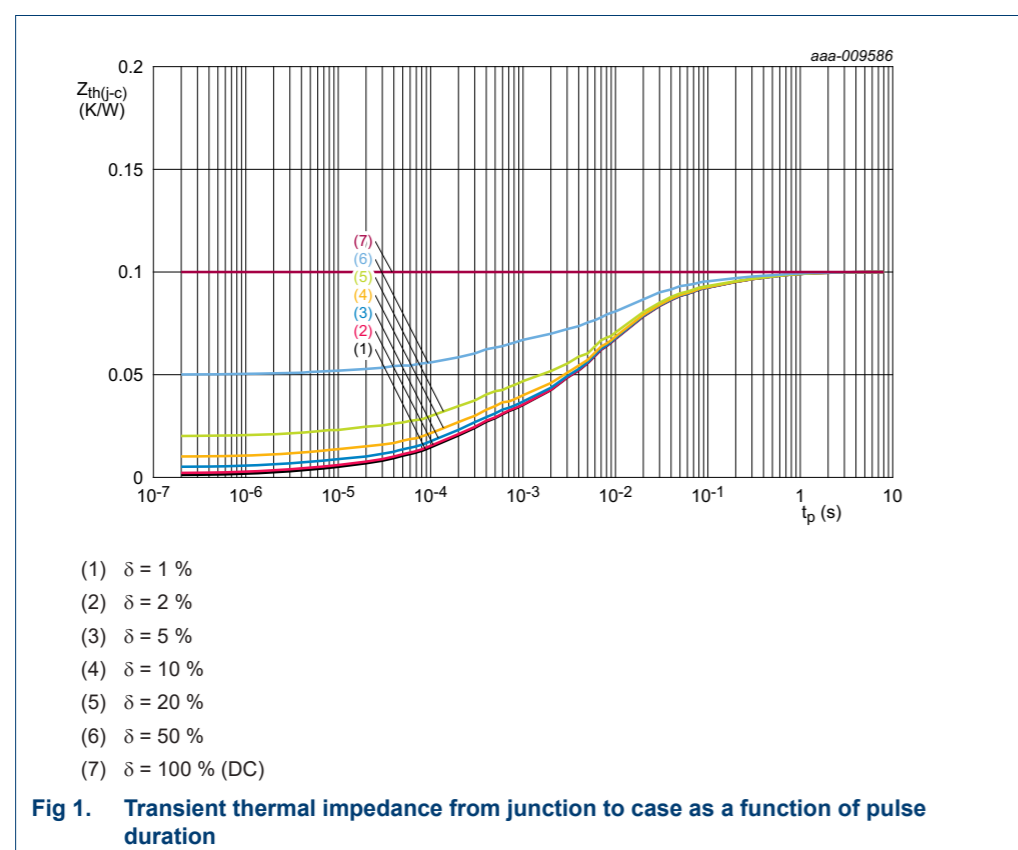
Symbol	Parameter	Conditions	Min	Max	Unit
V <sub>DS</sub>	drain-source voltage		-	135	V
V <sub>GS</sub>	gate-source voltage		-6	+11	V
T <sub>stg</sub>	storage temperature		-65	+150	°C
T <sub>j</sub>	junction temperature	[1]	-	225	°C

[1] Continuous use at maximum temperature will affect the reliability, for details refer to the on-line MTF calculator

**5. Thermal characteristics**
**Table 5. Thermal characteristics**

Symbol	Parameter	Conditions	Typ	Unit
$R_{th(j-c)}$	thermal resistance from junction to case	$T_j = 150\text{ °C}$	[1][2] 0.10	K/W
$Z_{th(j-c)}$	transient thermal impedance from junction to case	$T_j = 150\text{ °C}; t_p = 100\text{ }\mu\text{s}; \delta = 20\%$	[3] 0.03	K/W

- [1]  $T_j$  is the junction temperature.  
 [2]  $R_{th(j-c)}$  is measured under RF conditions.  
 [3] See [Figure 1](#).


**6. Characteristics**
**Table 6. DC characteristics**
 $T_j = 25\text{ °C};$  per section unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{(BR)DSS}$	drain-source breakdown voltage	$V_{GS} = 0\text{ V}; I_D = 5.5\text{ mA}$	135	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	$V_{DS} = 10\text{ V}; I_D = 550\text{ mA}$	1.25	1.9	2.25	V
$V_{GSq}$	gate-source quiescent voltage	$V_{DS} = 50\text{ V}; I_D = 20\text{ mA}$	0.68	1.5	1.88	V

**Table 6. DC characteristics ...continued**
 $T_j = 25\text{ °C};$  per section unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_{DSS}$	drain leakage current	$V_{GS} = 0\text{ V}; V_{DS} = 50\text{ V}$	-	-	2.8	$\mu\text{A}$
$I_{DSX}$	drain cut-off current	$V_{GS} = V_{GS(th)} + 3.75\text{ V}; V_{DS} = 10\text{ V}$	-	77	-	A
$I_{GSS}$	gate leakage current	$V_{GS} = 11\text{ V}; V_{DS} = 0\text{ V}$	-	-	280	nA
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = V_{GS(th)} + 3.75\text{ V}; I_D = 19.25\text{ A}$	-	0.08	-	$\Omega$

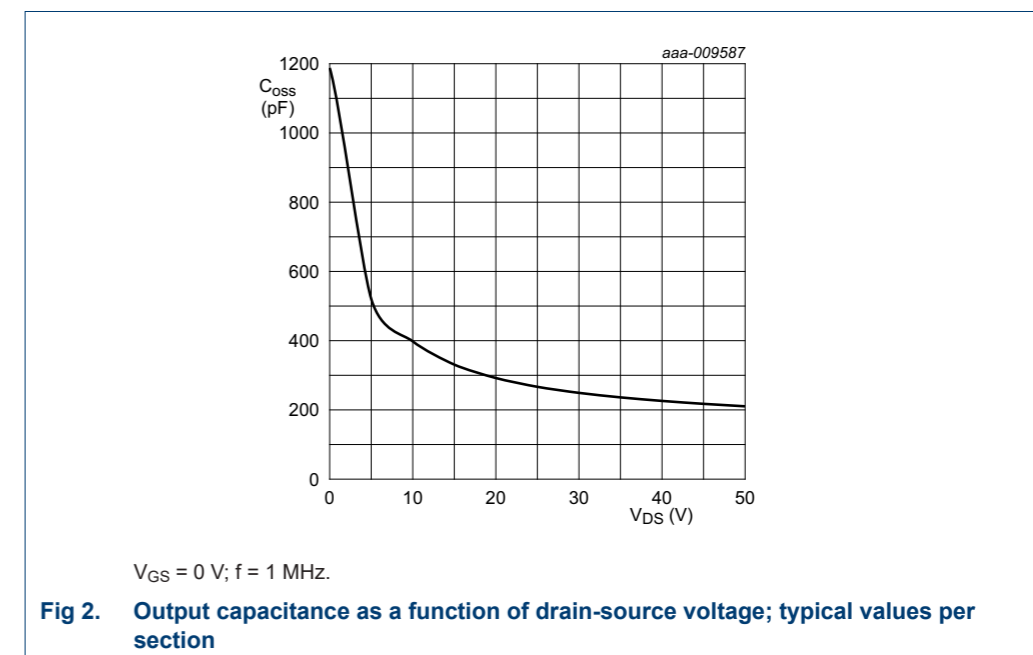
**Table 7. AC characteristics**
 $T_j = 25\text{ °C};$  per section unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$C_{rs}$	feedback capacitance	$V_{GS} = 0\text{ V}; V_{DS} = 50\text{ V}; f = 1\text{ MHz}$	-	6.2	-	pF
$C_{iss}$	input capacitance	$V_{GS} = 0\text{ V}; V_{DS} = 50\text{ V}; f = 1\text{ MHz}$	-	582	-	pF
$C_{oss}$	output capacitance	$V_{GS} = 0\text{ V}; V_{DS} = 50\text{ V}; f = 1\text{ MHz}$	-	212	-	pF

**Table 8. RF characteristics**

 Test signal: pulsed RF;  $t_p = 100\text{ }\mu\text{s}; \delta = 10\%; f = 108\text{ MHz};$  RF performance at  $V_{DS} = 50\text{ V}; I_{Dq} = 40\text{ mA}; T_{case} = 25\text{ °C};$  unless otherwise specified; in a class-AB production test circuit.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$G_p$	power gain	$P_L = 1400\text{ W}$	23.2	24.4	-	dB
$RL_{in}$	input return loss	$P_L = 1400\text{ W}$	-	-21	-14	dB
$\eta_D$	drain efficiency	$P_L = 1400\text{ W}$	69	73	-	%





## 7. Test information

### 7.1 Ruggedness in class-AB operation

The BLF188XR and BLF188XRS are capable of withstanding a load mismatch corresponding to VSWR > 65 : 1 through all phases under the following conditions:  $V_{DS} = 50\text{ V}$ ;  $I_{Dq} = 40\text{ mA}$ ;  $P_L = 1400\text{ W}$  pulsed;  $f = 108\text{ MHz}$ .

### 7.2 Impedance information

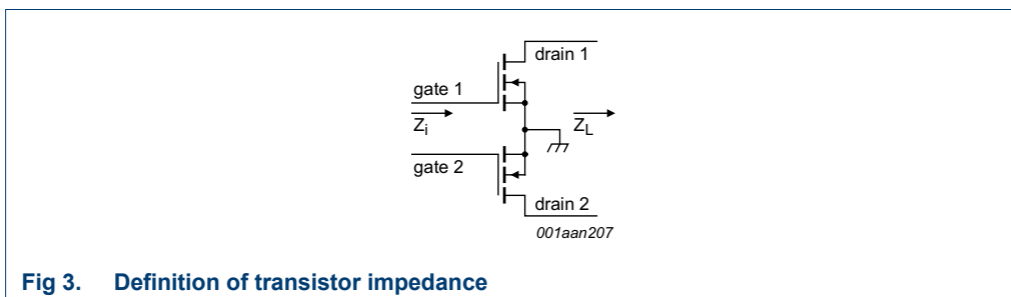


Fig 3. Definition of transistor impedance

Table 9. Typical push-pull impedance

Simulated  $Z_i$  and  $Z_L$  device impedance; impedance info at  $V_{DS} = 50\text{ V}$  and  $P_L = 1400\text{ W}$ .

f (MHz)	$Z_i$ ( $\Omega$ )	$Z_L$ ( $\Omega$ )
108	$2.94 - j9.64$	$2.74 + j0.57$

### 7.3 UIS avalanche energy

Table 10. Typical avalanche data per section

$T_{amb} = 25\text{ }^\circ\text{C}$ ; typical test data; test jig without water cooling.

$I_{AS}$ (A)	$E_{AS}$ (J)
35	4.5
40	3.4
45	2.4
50	2.0

For information see application note "AN10273".

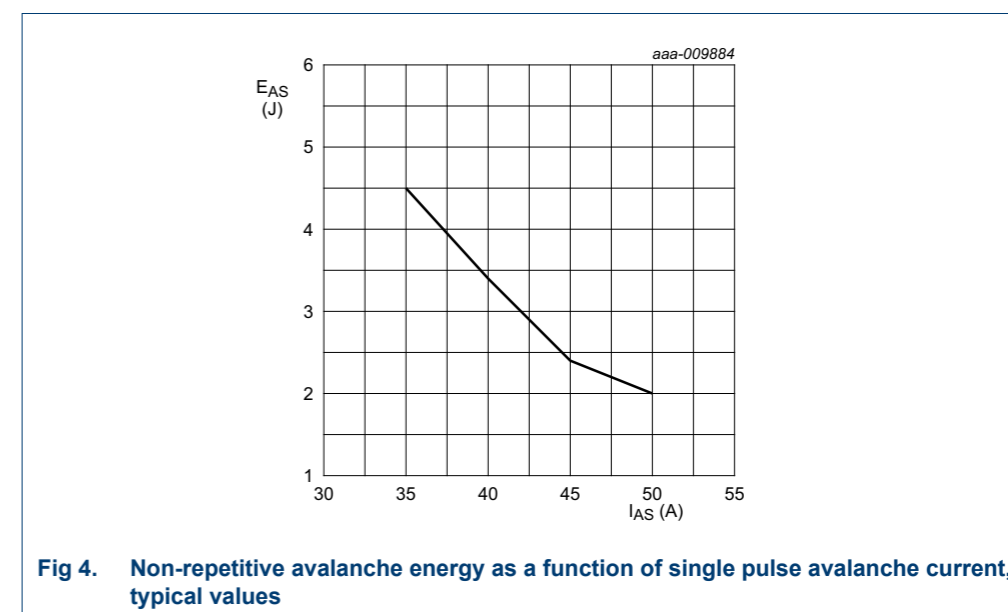
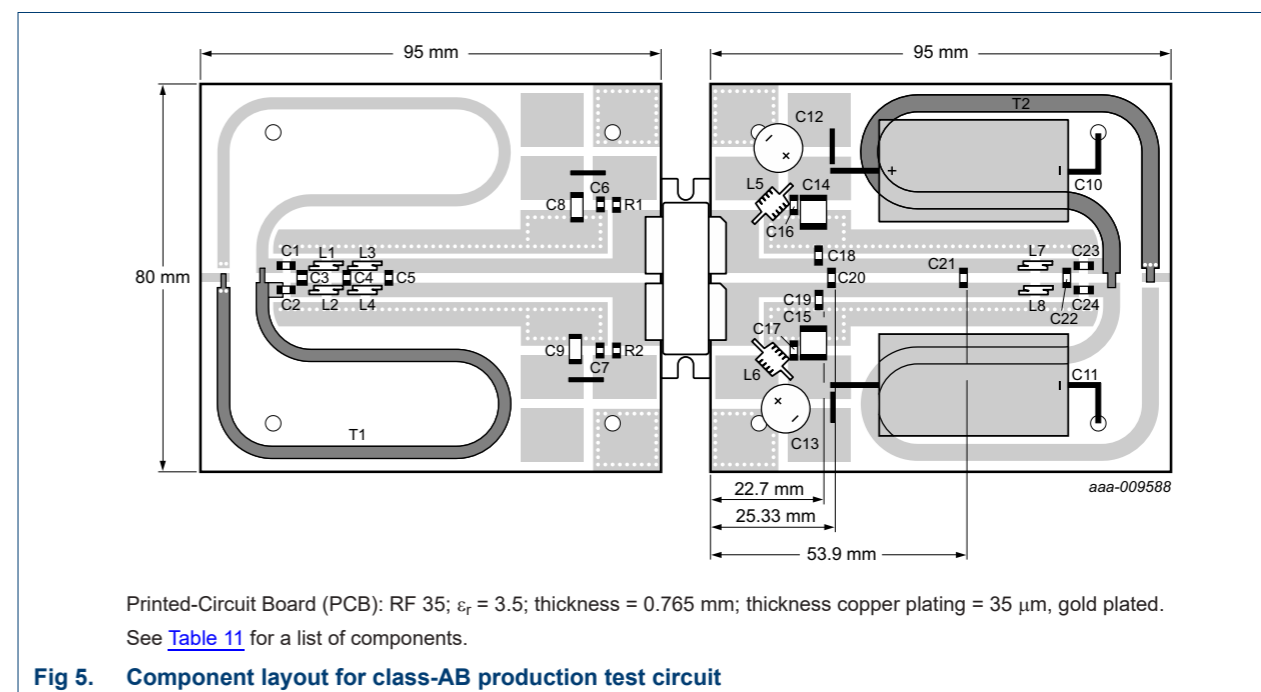


Fig 4. Non-repetitive avalanche energy as a function of single pulse avalanche current, typical values

### 7.4 Test circuit



Printed-Circuit Board (PCB): RF 35;  $\epsilon_r = 3.5$ ; thickness = 0.765 mm; thickness copper plating = 35  $\mu\text{m}$ , gold plated.

See Table 11 for a list of components.

Fig 5. Component layout for class-AB production test circuit

**Table 11. List of components**

 For test circuit see [Figure 5](#).

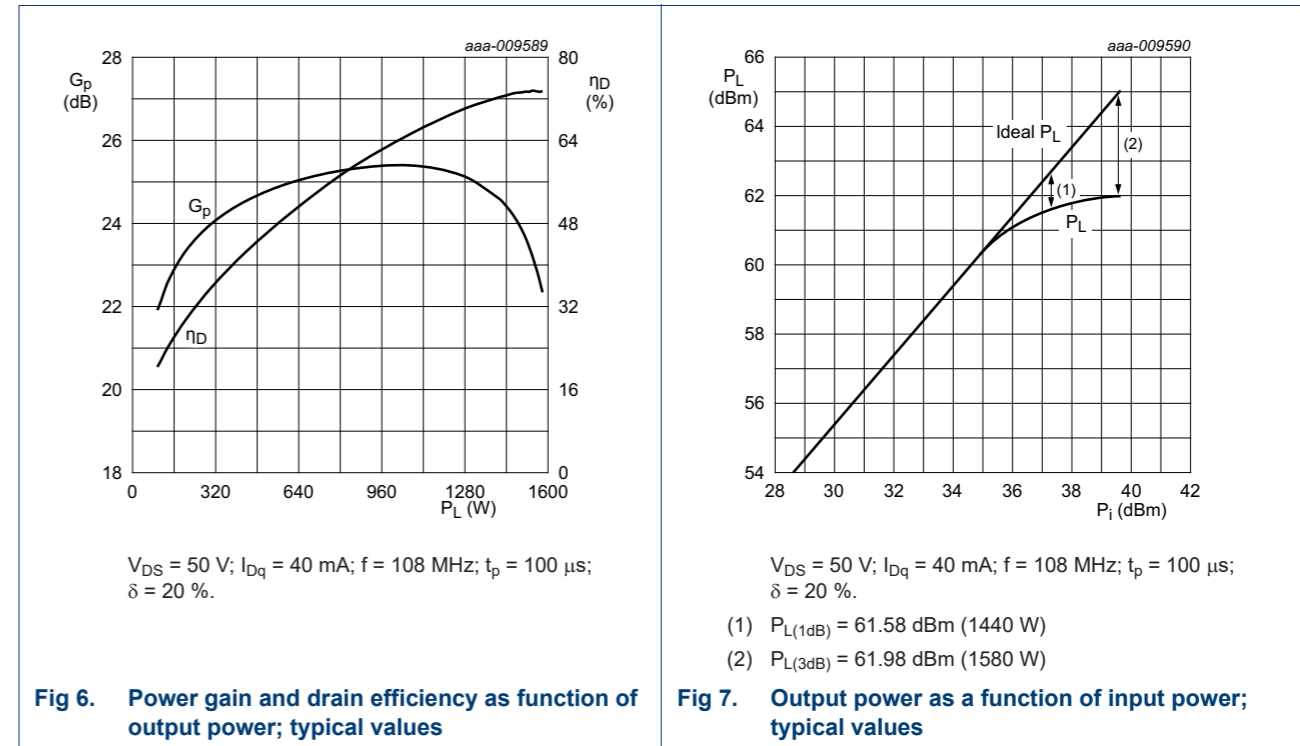
Component	Description	Value	Remarks
C1, C2, C6, C7, C16, C17, C23, C24	multilayer ceramic chip capacitor	1000 pF	[1]
C3	multilayer ceramic chip capacitor	47 pF	[2]
C4	multilayer ceramic chip capacitor	39 pF	[1]
C5	multilayer ceramic chip capacitor	200 pF	[1]
C8, C9, C14, C15	multilayer ceramic chip capacitor	4.7 $\mu$ F, 100 V	TDK C5750X7R2A475KT
C10, C11	electrolytic capacitor	2200 $\mu$ F, 63 V	
C12, C13	electrolytic capacitor	470 $\mu$ F, 63 V	
C18, C19	multilayer ceramic chip capacitor	120 pF	[1]
C20	multilayer ceramic chip capacitor	82 pF	[1]
C21	multilayer ceramic chip capacitor	120 pF	[1]
C22	multilayer ceramic chip capacitor	56 pF	[1]
L1, L2, L3, L4	1.5 turn 0.8 mm copper wire	D = 3.2 mm, length = 1.6 mm	
L5, L6	5.0 turn 0.8 mm copper wire	D = 3.0 mm, length = 4 mm	
L7, L8	2.5 turn 0.8 mm copper wire	D = 3.0 mm, length = 2.4 mm	
R1, R2	resistor	9.1 $\Omega$	SMD 1206
T1	semi rigid coax	25 $\Omega$ , length = 160 mm	Micro-Coax UT-090C-25
T2	semi rigid coax	25 $\Omega$ , length = 160 mm	Micro-Coax UT-141C-25

[1] American Technical Ceramics type 800B or capacitor of same quality.

[2] American Technical Ceramics type 100B or capacitor of same quality.

**7.5 Graphical data**

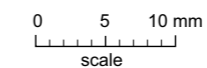
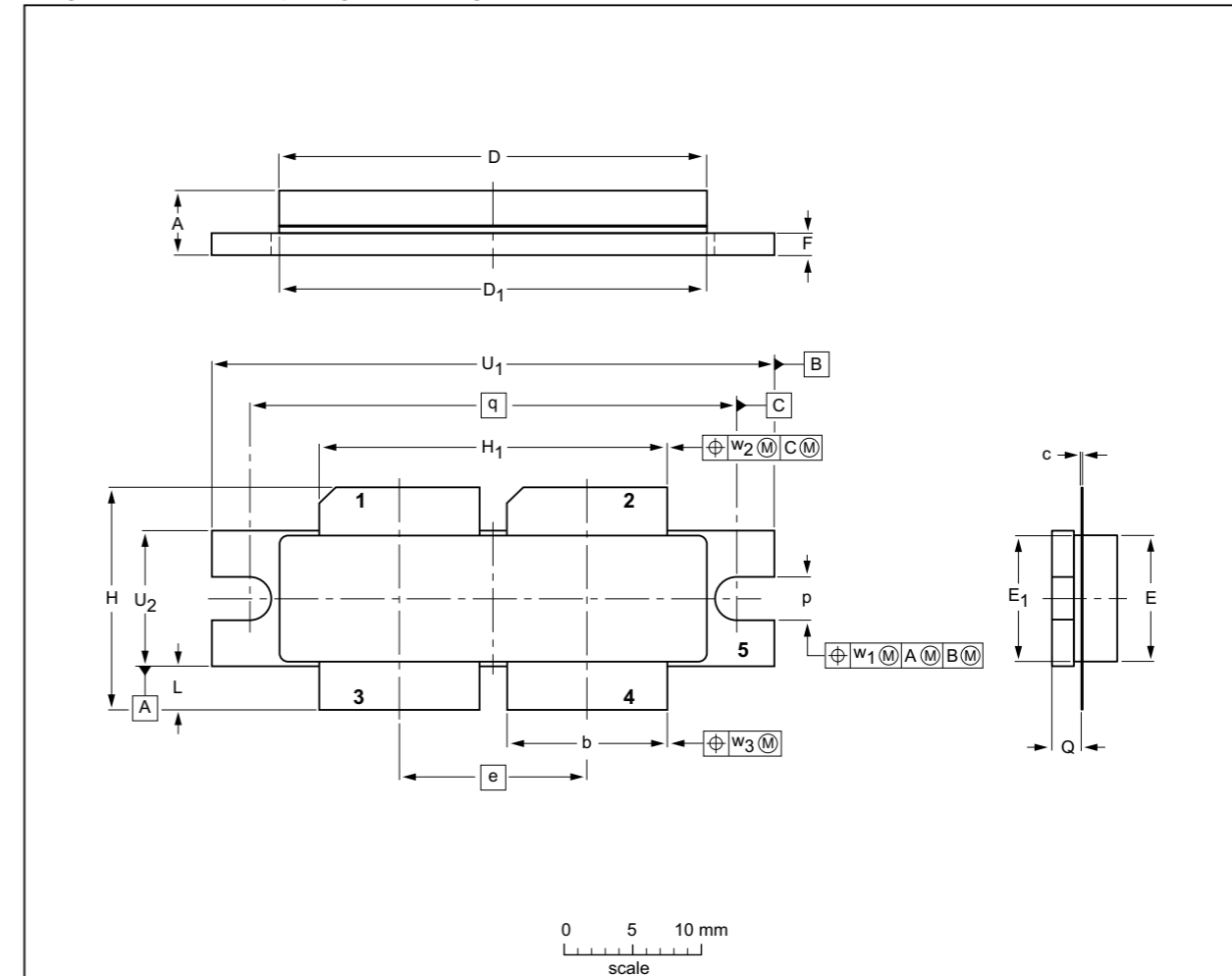
The following figures are measured in a class-AB production test circuit.

**7.5.1 1-Tone CW pulsed**

**Fig 6. Power gain and drain efficiency as function of output power; typical values**
**Fig 7. Output power as a function of input power; typical values**

8. Package outline

Flanged balanced ceramic package; 2 mounting holes; 4 leads

SOT539A



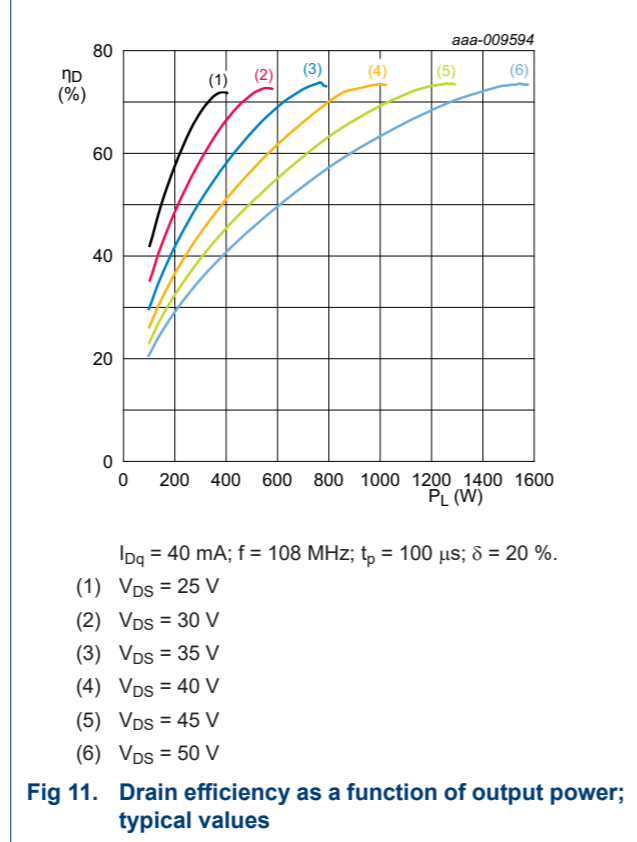
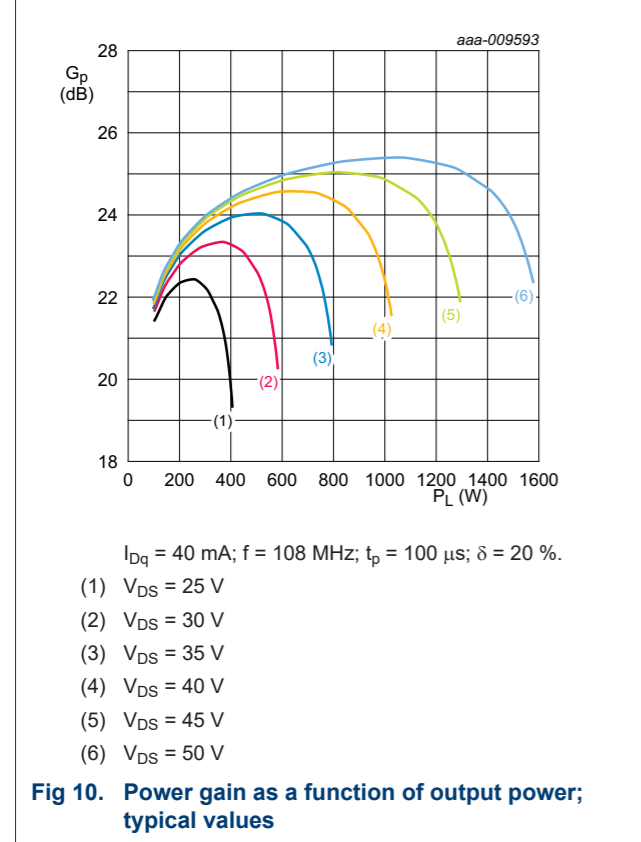
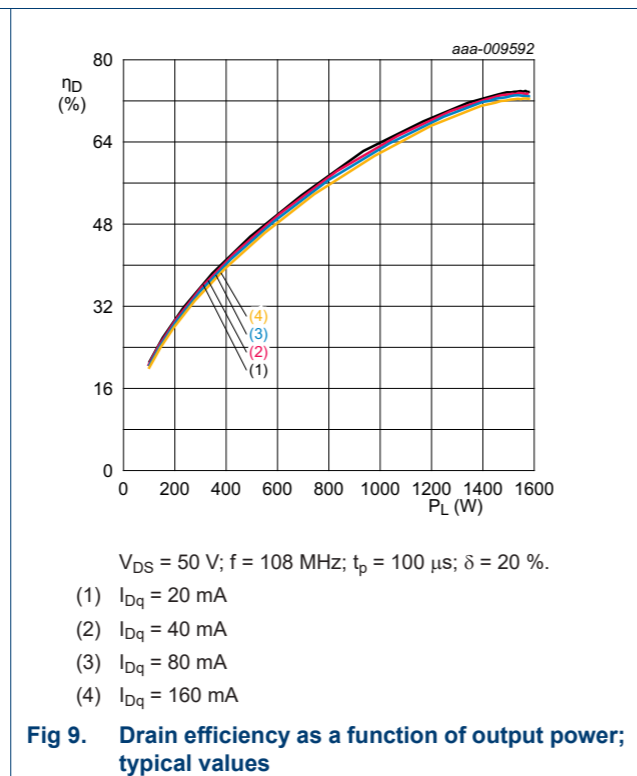
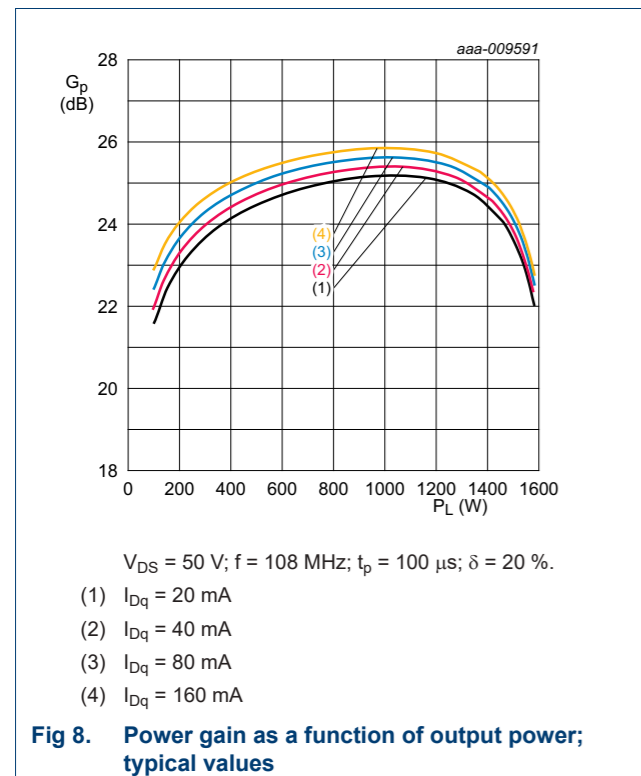
DIMENSIONS (millimetre dimensions are derived from the original inch dimensions)

UNIT	A	b	c	D	D <sub>1</sub>	e	E	E <sub>1</sub>	F	H	H <sub>1</sub>	L	p	Q	q	U <sub>1</sub>	U <sub>2</sub>	w <sub>1</sub>	w <sub>2</sub>	w <sub>3</sub>
mm	4.7 4.2	11.81 11.56	0.18 0.10	31.55 30.94	31.52 30.96	13.72	9.50 9.30	9.53 9.27	1.75 1.50	17.12 16.10	25.53 25.27	3.48 2.97	3.30 3.05	2.26 2.01	35.56	41.28 41.02	10.29 10.03	0.25	0.51	0.25
inches	0.185 0.165	0.465 0.455	0.007 0.004	1.242 1.218	1.241 1.219	0.540	0.374 0.366	0.375 0.365	0.069 0.059	0.674 0.634	1.005 0.995	0.137 0.117	0.130 0.120	0.089 0.079	1.400	1.625 1.615	0.405 0.395	0.010	0.020	0.010

Note  
 1. millimeter dimensions are derived from the original inch dimensions.  
 2. recommended screw pitch dimension of 1.52 inch (38.6 mm) based on M3 screw.

OUTLINE VERSION	REFERENCES			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ		
SOT539A					10-02-02 12-05-02

Fig 12. Package outline SOT539A



9. Handling information

CAUTION



This device is sensitive to ElectroStatic Discharge (ESD). Observe precautions for handling electrostatic sensitive devices. Such precautions are described in the ANSI/ESD S20.20, IEC/ST 61340-5, JESD625-A or equivalent standards.

10. Abbreviations

Table 12. Abbreviations

Acronym	Description
CW	Continuous Wave
DVB-T	Digital Video Broadcast - Terrestrial
ESD	ElectroStatic Discharge
HF	High Frequency
LDMOS	Laterally Diffused Metal-Oxide Semiconductor
MTF	Median Time to Failure
SMD	Surface Mounted Device
UIS	Unclamped Inductive Switching
VSWR	Voltage Standing-Wave Ratio

11. Revision history

Table 13. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BLF188XR_BLF188XRS v.6	20150901	Product data sheet	-	BLF188XR_BLF188XRS v.5
Modifications:				<ul style="list-style-type: none"> <li>The format of this document has been redesigned to comply with the new identity guidelines of Ampleon.</li> <li>Legal texts have been adapted to the new company name where appropriate.</li> </ul>
BLF188XR_BLF188XRS v.5	20131112	Product data sheet	-	BLF188XR_BLF188XRS v.4
BLF188XR_BLF188XRS v.4	20131030	Product data sheet	-	BLF188XR_BLF188XRS v.3
BLF188XR_BLF188XRS v.3	20130801	Objective data sheet	-	BLF188XR_BLF188XRS v.2
BLF188XR_BLF188XRS v.2	20130712	Objective data sheet	-	BLF188XR_BLF188XRS v.1
BLF188XR_BLF188XRS v.1	20130506	Objective data sheet	-	-

Earless flanged balanced ceramic package; 4 leads

SOT539B

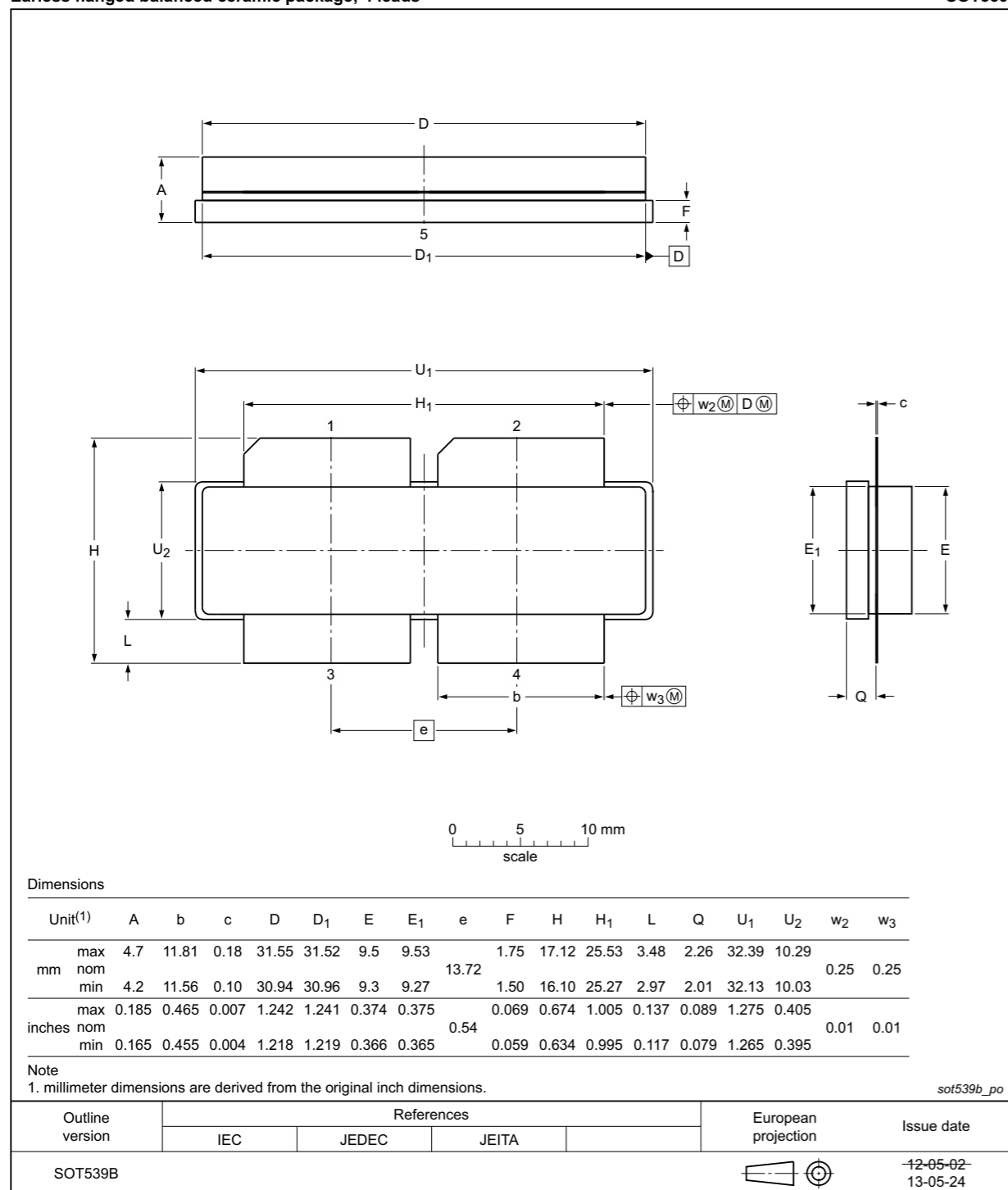


Fig 13. Package outline SOT539B

## 12. Legal information

### 12.1 Data sheet status

Document status <sup>[1][2]</sup>	Product status <sup>[3]</sup>	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL <http://www.ampleon.com>.

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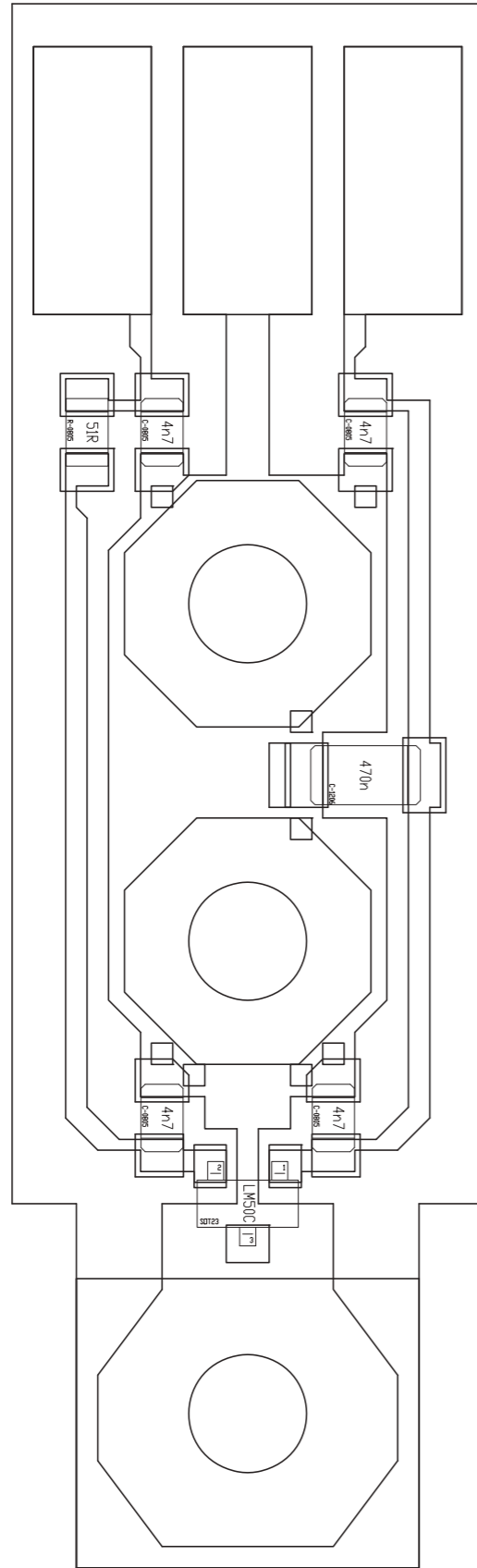
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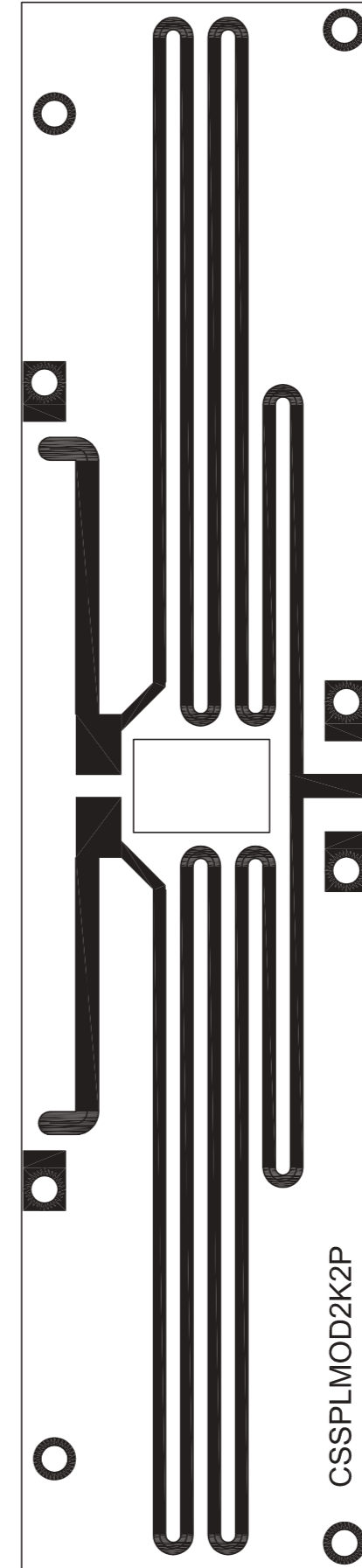
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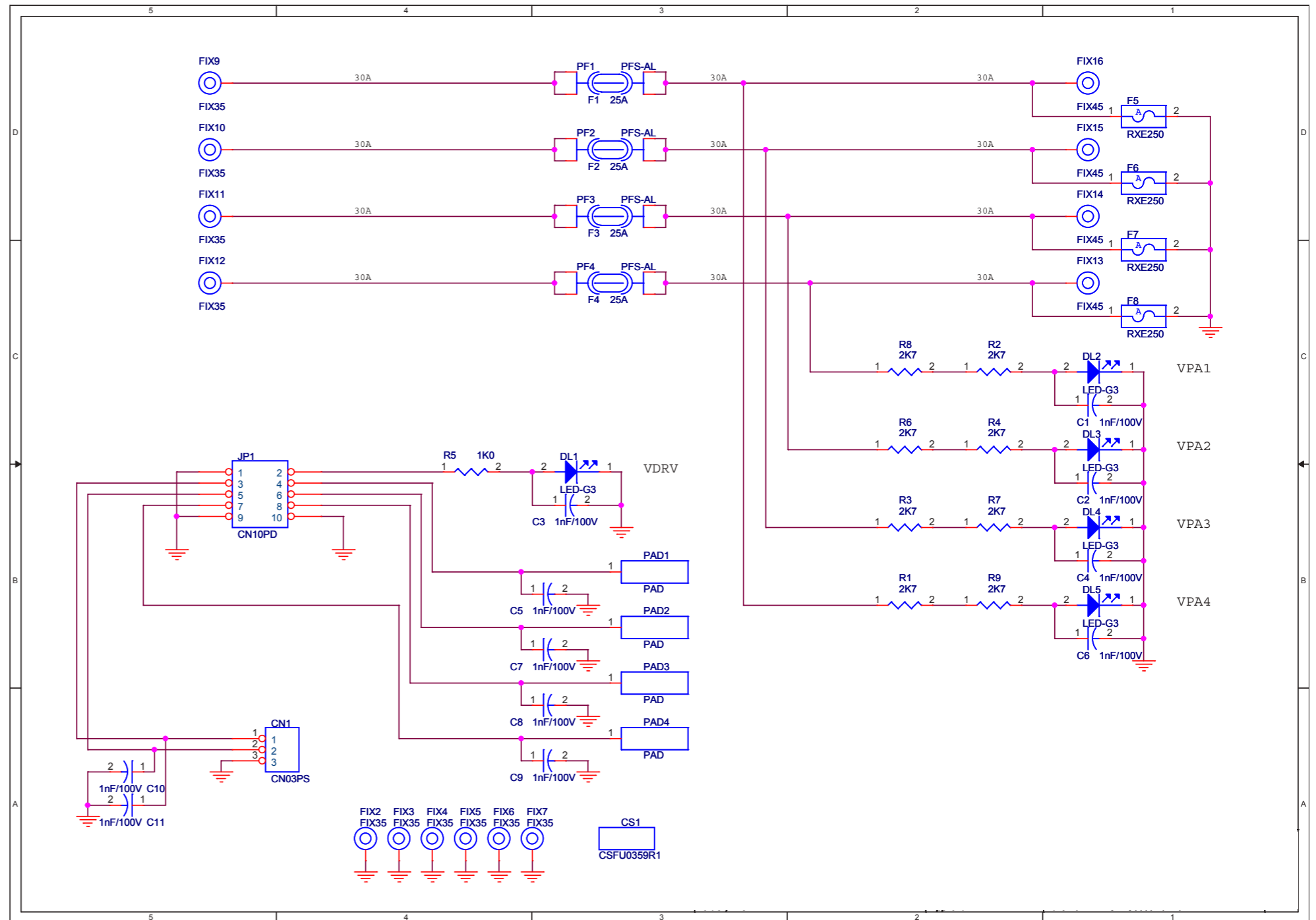
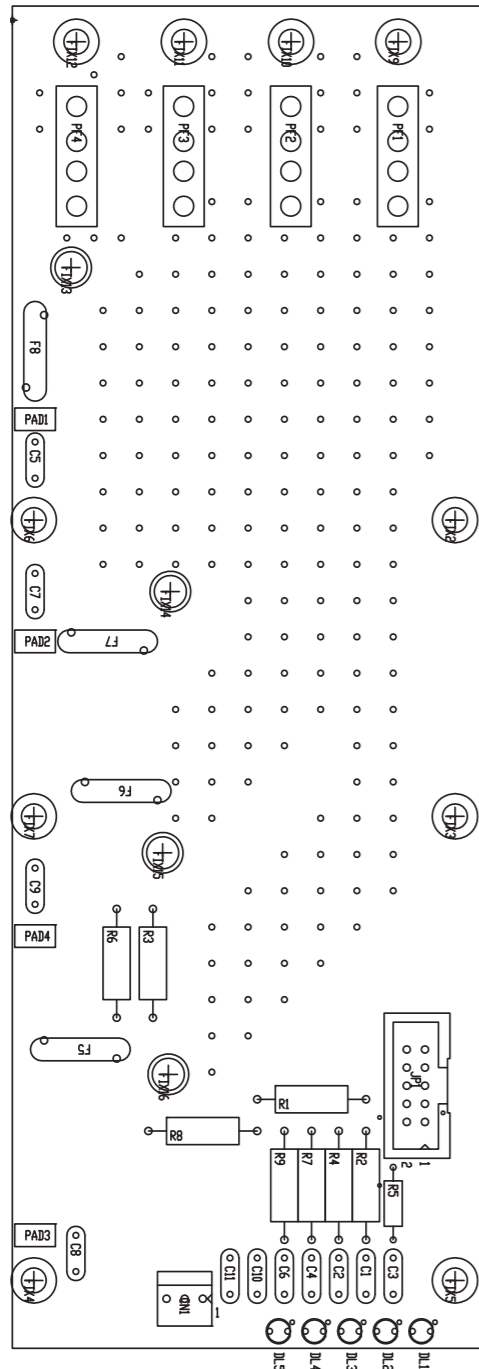
Temperature probe (SLSNDTMPJ5K)



Splitter (CSSPLMOD2K2P)

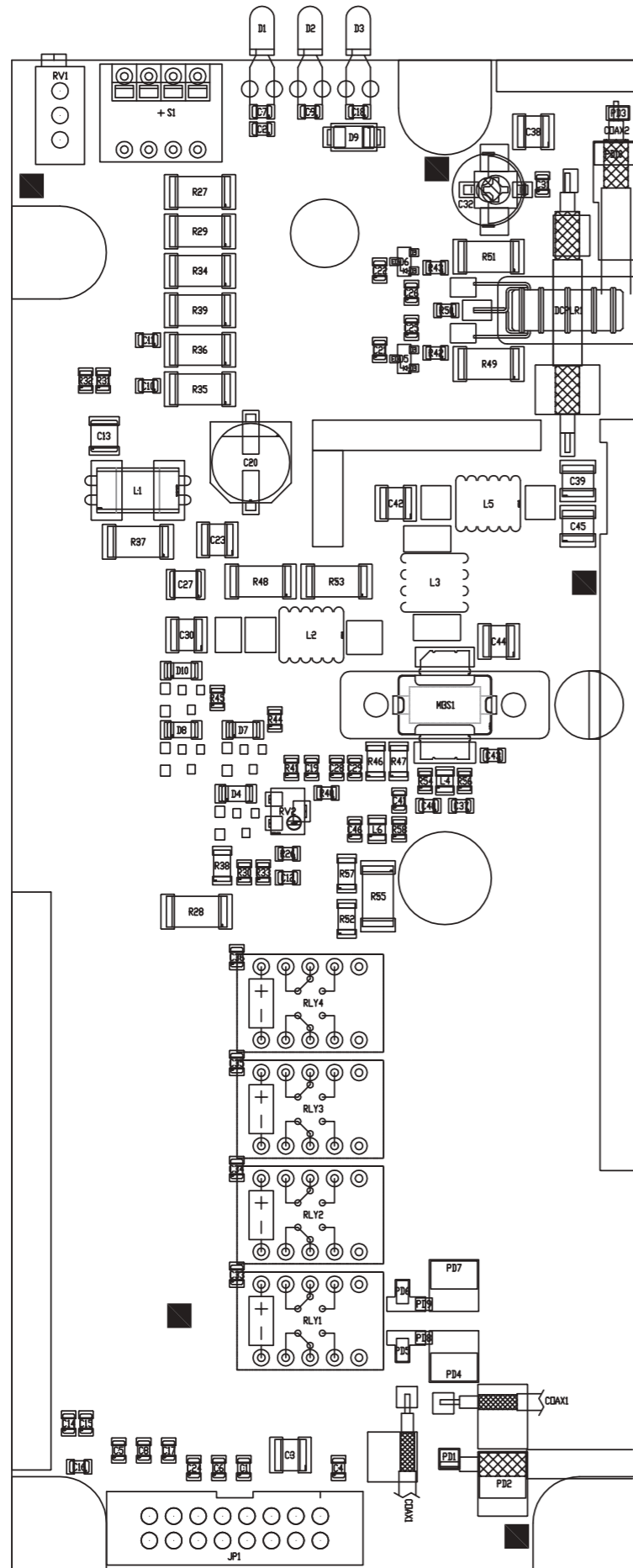


**Fuses board (SLFU0359R01V01)**



Item	Quantity	Reference	Part
1	1	CN1	CN03PS
2	1	CS1	CSFU0359R1
3	11	C1,C2,C3,C4,C5,C6,C7,C8,C9,C10,C11	1nF/100V
4	5	DL1,DL2,DL3,DL4,DL5	LED-G3
5	10	FIX2,FIX3,FIX4,FIX5,FIX6,FIX7,FIX9,FIX10,FIX11,FIX12	FIX35
6	4	FIX13,FIX14,FIX15,FIX16	FIX45
7	4	F1,F2,F3,F4	25A
8	4	F5,F6,F7,F8	RXE300
9	1	JP1	CN10PD
10	4	PAD1,PAD2,PAD3,PAD4	PAD
11	4	PF1,PF2,PF3,PF4	PFS-AL
12	8	R1,R2,R3,R4,R6,R7,R8,R9	2K7
13	1	R5	1K0

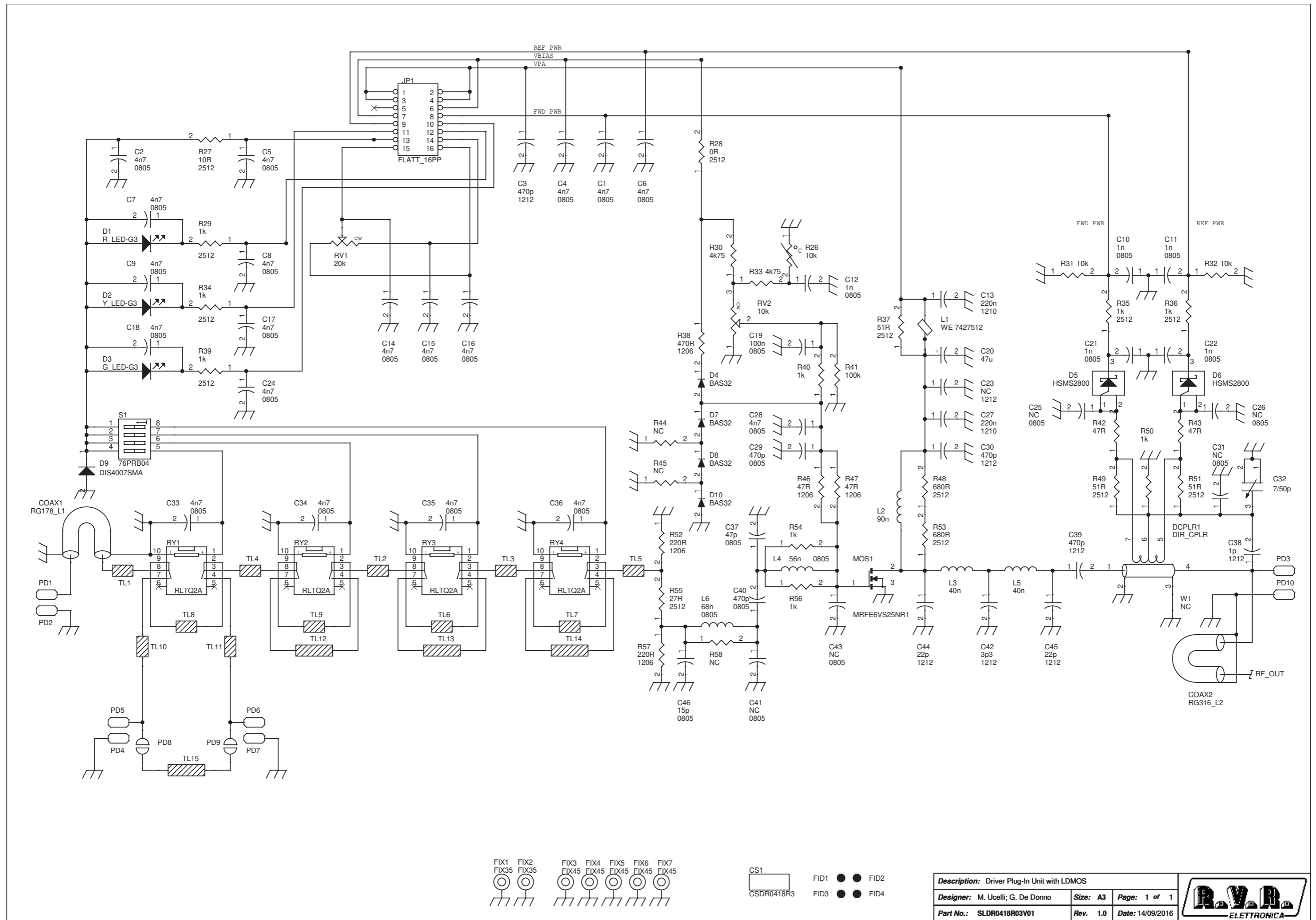
**Driver board (KKDRV243A)**



Driver Plug-In Unit with LDMOS  
SLDR0418R03V01  
Revision: 1.0  
M. Ucelli; G. De Donno  
14/09/2016

Item	Quantity	Reference	Part	Description
1	1	COAX1	RG178_L1	Coax Cable RG178 Length 620mm Shiel to Shield
2	1	CS1	CSDR0418R3	Circuito stampato PA
3	19	C1,C2,C4,C5,C6,C7,C8,C9, C14,C15,C16,C17,C18,C24, C28,C33,C34,C35,C36	4n7	SMD 0805 MLCC X7R
4	4	C3,C23,C30,C39	470p	Cond. SMD 1212 HQ
5	5	C10,C11,C12,C21,C22	1n	Cond. SMD 0805 COG
6	2	C13,C27	220n	Capacitor SMD 1210 MLCC X7R 100V
7	1	C19	100n	SMD 0805 MLCC X7R
8	1	C20	47u	Cond. Elett. SMD d. 8mm 63V
9	5	C25,C26,C31,C41,C43	NC	Cond. SMD 0805 COG
10	2	C29,C40	470p	Cond. SMD 0805 COG
11	1	C32	7/50p	Adj. Cap 7 / 50pF
12	1	C37	47p	Cond. SMD 0805 COG
13	1	C38	1p	Cond. SMD 1212 HQ
14	1	C42	3p9	Cond. SMD 1212 HQ
15	1	C44	22p	Cond. SMD 1212 HQ
16	1	C45	18p	Cond. SMD 1212 HQ
17	1	C46	15p	Cond. SMD 0805 COG
18	1	DCPLR1	DIR_CPLR	Toroidal Directional Coupler
19	1	D1	R_LED-G3	LED Rosso 3mm
20	1	D2	Y_LED-G3	LED Giallo 3mm
21	1	D3	G_LED-G3	LED Verde 3mm
22	4	D4,D7,D8,D10	BAS32	Minimelf Diode
23	2	D5,D6	HSMS2800	Hot Carrier Schottky Diode
24	1	D9	DIS4007SMA	Silicon Rect. Diode SMA / DO-214AC
25	4	FID1,FID2,FID3,FID4	FID	Fiducial CS
26	5	FIX1,FIX2,FIX3,FIX4,FIX5	FIX35	
27	1	JP1	FLATT_16PP	Connettore M circ. stamp. 16pp Flatt
28	1	L1	WE 7427512	Ferrite Bead
29	1	L2	90n	5 spire filo 1mm R.Arg avvolte su D.4,5 lungh 9 mm
30	1	L3	40n	3 spire filo 1mm R.Arg avvolte su D.4,5 lungh 4 mm
31	1	L4	56n	Induttanza SMD HQ 2012 Wirewound (0805)
32	1	L5	40n	3 spire filo 1mm R.Arg avvolte su D.4,5 lungh 4 mm
33	1	L6	68n	Induttanza SMD HQ 2012 Wirewound (0805)
34	1	MOS1	MRFE6VS25NR1	Single LDMOS
35	10	PD1,PD2,PD3,PD4,PD5,PD6,PAD PD7,PD8,PD9,PD10		Pad for connection
36	1	RV1	20k	3266Z Trimmer
37	1	RV2	10k	Trimmer SMD
38	4	RY1,RY2,RY3,RY4	RLTQ2A	Relay TQ2 12VDC tipo: OMRON G6H-2-100
39	1	R26	10k	Res. NTC SMD 0805
40	1	R27	10R	Res. SMD 2512
41	1	R28	0R	Res. SMD 2512
42	5	R29,R34,R35,R36,R39	1k	Res. SMD 2512
43	2	R30,R33	4k75	Res. SMD 0805
44	2	R31,R32	10k	Res. SMD 0805
45	3	R37,R49,R51	51R	Res. SMD 2512
46	1	R38	470R	Res. SMD 1206
47	4	R40,R50,R54,R56	1k	Res. SMD 0805
48	1	R41	100k	Res. SMD 0805
49	2	R42,R43	47R	Res. SMD 0805
50	3	R44,R45,R58	NC	Res. SMD 0805
51	2	R46,R47	47R	Res. SMD 1206
52	2	R48,R53	680R	Res. SMD 2512
53	2	R52,R57	220R	Res. SMD 1206
54	1	R55	27R	Res. SMD 2512
55	1	S1	76PRB04	Dip Switch 4 cont. 90 gradi
56	11	TL1,TL2,TL3,TL4,TL5,TL6, TL7,TL8,TL9,TL10,TL11	TLINE_S	Linea strip CS
57	4	TL12,TL13,TL14,TL15	TLINE_M	Linea strip CS
58	1	W1	NC	
59	1	COAX2	RG316_L2	Coax Cable RG316 Length 282mm Shiel to Shield





# Datasheet MRFE6VS25NR1

**Freescall Semiconductor**  
Technical Data

## RF Power LDMOS Transistor

### High Ruggedness N-Channel Enhancement-Mode Lateral MOSFET

RF power transistor designed for both narrowband and broadband ISM, broadcast and aerospace applications operating at frequencies from 1.8 to 2000 MHz. This device is fabricated using Freescale's enhanced ruggedness platform and is suitable for use in applications where high VSWRs are encountered.

**Typical Performance:**  $V_{DD} = 50$  Volts

Frequency (MHz)	Signal Type	$P_{out}$ (W)	$G_{ps}$ (dB)	$\eta_D$ (%)	IMD (dBc)
1.8 to 30 (1)	Two-Tone (10 kHz spacing)	25 PEP	25	51	-30
512	Pulse (100 $\mu$ sec, 20% Duty Cycle)	25 Peak	25.4	74.5	—
512	CW	25	25.5	74.7	—
1030	CW	25	22.5	60	—

1. The values shown are the minimum measured performance numbers across the indicated frequency range.

#### Load Mismatch/Ruggedness

Frequency (MHz)	Signal Type	VSWR	$P_{out}$ (W)	Test Voltage	Result
30	CW	>65:1 at all Phase Angles	31 (3 dB Overdrive)	50	No Device Degradation
512	Pulse (100 $\mu$ sec, 20% Duty Cycle)		31 Peak (3 dB Overdrive)		
512	CW		30.5 (3 dB Overdrive)		
1030	CW		31 (3 dB Overdrive)		

#### Features

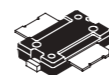
- Wide Operating Frequency Range
- Extremely Rugged
- Unmatched, Capable of Very Broadband Operation
- Integrated Stability Enhancements
- Low Thermal Resistance
- Extended ESD Protection Circuit
- In Tape and Reel. R1 Suffix = 500 Units, 24 mm Tape Width, 13 inch Reel.

Document Number: MRFE6VS25N  
Rev. 0, 6/2012

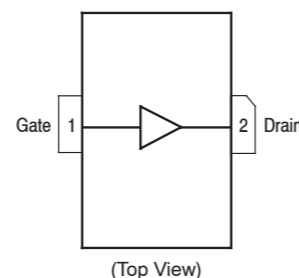


## MRFE6VS25NR1

**1.8-2000 MHz, 25 W, 50 V WIDEBAND RF POWER LDMOS TRANSISTOR**



**TO-270-2 PLASTIC**



(Top View)

Note: The backside of the package is the source terminal for the transistor.

**Figure 1. Pin Connections**

**Table 1. Maximum Ratings**

Rating	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	-0.5, +133	Vdc
Gate-Source Voltage	$V_{GS}$	-6.0, +10	Vdc
Storage Temperature Range	$T_{stg}$	-65 to +150	$^{\circ}$ C
Case Operating Temperature	$T_C$	-40 to +150	$^{\circ}$ C
Operating Junction Temperature (1,2)	$T_J$	-40 to +225	$^{\circ}$ C

**Table 2. Thermal Characteristics**

Characteristic	Symbol	Value (2,3)	Unit
Thermal Resistance, Junction to Case CW: Case Temperature 80 $^{\circ}$ C, 25 W CW, 50 Vdc, $I_{DQ} = 10$ mA, 512 MHz	$R_{\theta JC}$	1.2	$^{\circ}$ C/W
Thermal Impedance, Junction to Case Pulse: Case Temperature 77 $^{\circ}$ C, 25 W Peak, 100 $\mu$ sec Pulse Width, 20% Duty Cycle, 50 Vdc, $I_{DQ} = 10$ mA, 512 MHz	$Z_{\theta JC}$	0.29	$^{\circ}$ C/W

**Table 3. ESD Protection Characteristics**

Test Methodology	Class
Human Body Model (per JESD22-A114)	2, passes 2500 V
Machine Model (per EIA/JESD22-A115)	B, passes 250 V
Charge Device Model (per JESD22-C101)	IV, passes 2000 V

**Table 4. Moisture Sensitivity Level**

Test Methodology	Rating	Package Peak Temperature	Unit
Per JESD22-A113, IPC/JEDEC J-STD-020	3	260	$^{\circ}$ C

**Table 5. Electrical Characteristics** ( $T_A = 25^{\circ}$ C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>Off Characteristics</b>					
Gate-Source Leakage Current ( $V_{GS} = 5$ Vdc, $V_{DS} = 0$ Vdc)	$I_{GSS}$	—	—	400	nAdc
Drain-Source Breakdown Voltage ( $V_{GS} = 0$ Vdc, $I_D = 50$ mA)	$V_{(BR)DSS}$	133	142	—	Vdc
Zero Gate Voltage Drain Leakage Current ( $V_{DS} = 50$ Vdc, $V_{GS} = 0$ Vdc)	$I_{DSS}$	—	—	2	$\mu$ Adc
Zero Gate Voltage Drain Leakage Current ( $V_{DS} = 100$ Vdc, $V_{GS} = 0$ Vdc)	$I_{DSS}$	—	—	7	$\mu$ Adc
<b>On Characteristics</b>					
Gate Threshold Voltage ( $V_{DS} = 10$ Vdc, $I_D = 85$ $\mu$ Adc)	$V_{GS(th)}$	1.5	2.0	2.5	Vdc
Gate Quiescent Voltage ( $V_{DD} = 50$ Vdc, $I_D = 10$ mA, Measured in Functional Test)	$V_{GS(Q)}$	2.0	2.4	3.0	Vdc
Drain-Source On-Voltage ( $V_{GS} = 10$ Vdc, $I_D = 210$ mA)	$V_{DS(on)}$	—	0.28	—	Vdc
<b>Dynamic Characteristics</b>					
Reverse Transfer Capacitance ( $V_{DS} = 50$ Vdc $\pm$ 30 mV(rms)ac @ 1 MHz, $V_{GS} = 0$ Vdc)	$C_{rss}$	—	0.26	—	pF
Output Capacitance ( $V_{DS} = 50$ Vdc $\pm$ 30 mV(rms)ac @ 1 MHz, $V_{GS} = 0$ Vdc)	$C_{oss}$	—	14.2	—	pF
Input Capacitance ( $V_{DS} = 50$ Vdc, $V_{GS} = 0$ Vdc $\pm$ 30 mV(rms)ac @ 1 MHz)	$C_{iss}$	—	39.2	—	pF

#### On Characteristics

Gate Threshold Voltage ( $V_{DS} = 10$ Vdc, $I_D = 85$ $\mu$ Adc)	$V_{GS(th)}$	1.5	2.0	2.5	Vdc
Gate Quiescent Voltage ( $V_{DD} = 50$ Vdc, $I_D = 10$ mA, Measured in Functional Test)	$V_{GS(Q)}$	2.0	2.4	3.0	Vdc
Drain-Source On-Voltage ( $V_{GS} = 10$ Vdc, $I_D = 210$ mA)	$V_{DS(on)}$	—	0.28	—	Vdc

#### Dynamic Characteristics

Reverse Transfer Capacitance ( $V_{DS} = 50$ Vdc $\pm$ 30 mV(rms)ac @ 1 MHz, $V_{GS} = 0$ Vdc)	$C_{rss}$	—	0.26	—	pF
Output Capacitance ( $V_{DS} = 50$ Vdc $\pm$ 30 mV(rms)ac @ 1 MHz, $V_{GS} = 0$ Vdc)	$C_{oss}$	—	14.2	—	pF
Input Capacitance ( $V_{DS} = 50$ Vdc, $V_{GS} = 0$ Vdc $\pm$ 30 mV(rms)ac @ 1 MHz)	$C_{iss}$	—	39.2	—	pF

1. Continuous use at maximum temperature will affect MTTF.
2. MTTF calculator available at <http://www.freescale.com/rf>. Select Software & Tools/Development Tools/Calculators to access MTTF calculators by product.
3. Refer to AN1955, *Thermal Measurement Methodology of RF Power Amplifiers*. Go to <http://www.freescale.com/rf>. Select Documentation/Application Notes - AN1955.

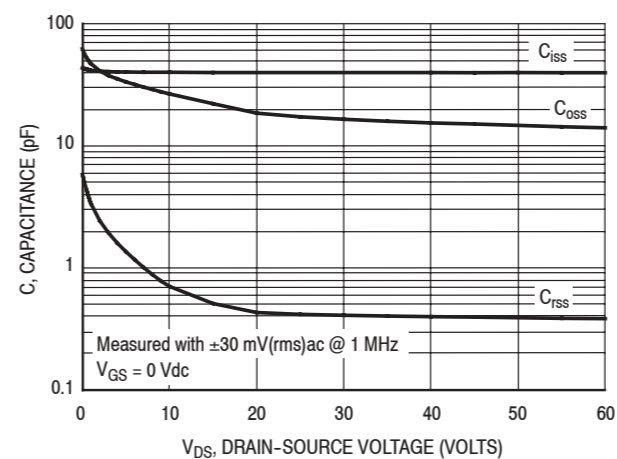
**Table 5. Electrical Characteristics** ( $T_A = 25^\circ\text{C}$  unless otherwise noted) (continued)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>Functional Tests</b> (In Freescale Test Fixture, 50 ohm system) $V_{DD} = 50\text{ Vdc}$ , $I_{DQ} = 10\text{ mA}$ , $P_{out} = 25\text{ W Peak}$ (5 W Avg.), $f = 512\text{ MHz}$ , 100 $\mu\text{sec}$ Pulse Width, 20% Duty Cycle					
Power Gain	$G_{ps}$	24.0	25.4	27.0	dB
Drain Efficiency	$\eta_D$	70.0	74.5	—	%
Input Return Loss	IRL	—	-16	-10	dB

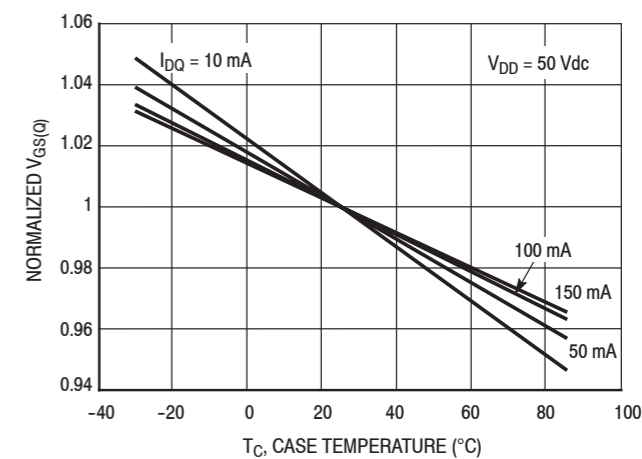
**Load Mismatch/Ruggedness** (In Freescale Test Fixture, 50 ohm system,  $I_{DQ} = 10\text{ mA}$ )

Frequency (MHz)	Signal Type	VSWR	$P_{out}$ (W)	Test Voltage, $V_{DD}$	Result
512	Pulse (100 $\mu\text{sec}$ , 20% Duty Cycle)	>65:1 at all Phase Angles	31 Peak (3 dB Overdrive)	50	No Device Degradation
	CW		30.5 (3 dB Overdrive)		

**TYPICAL CHARACTERISTICS**

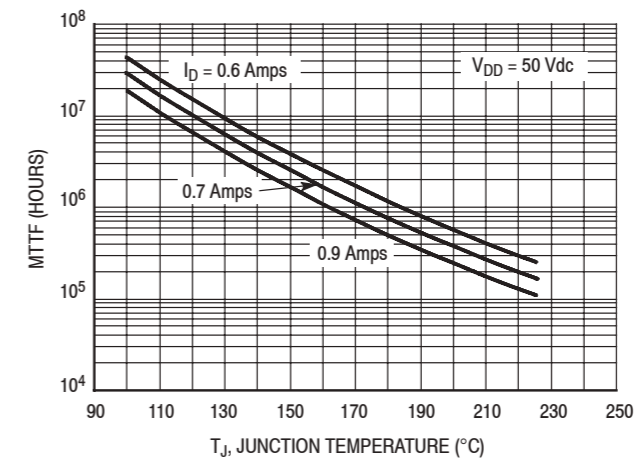


**Figure 2. Capacitance versus Drain-Source Voltage**



**Figure 3. Normalized  $V_{GS}$  versus Quiescent Current and Case Temperature**

$I_{DQ}$ (mA)	Slope (mV/ $^\circ\text{C}$ )
10	-2.160
50	-1.790
100	-1.760
150	-1.680



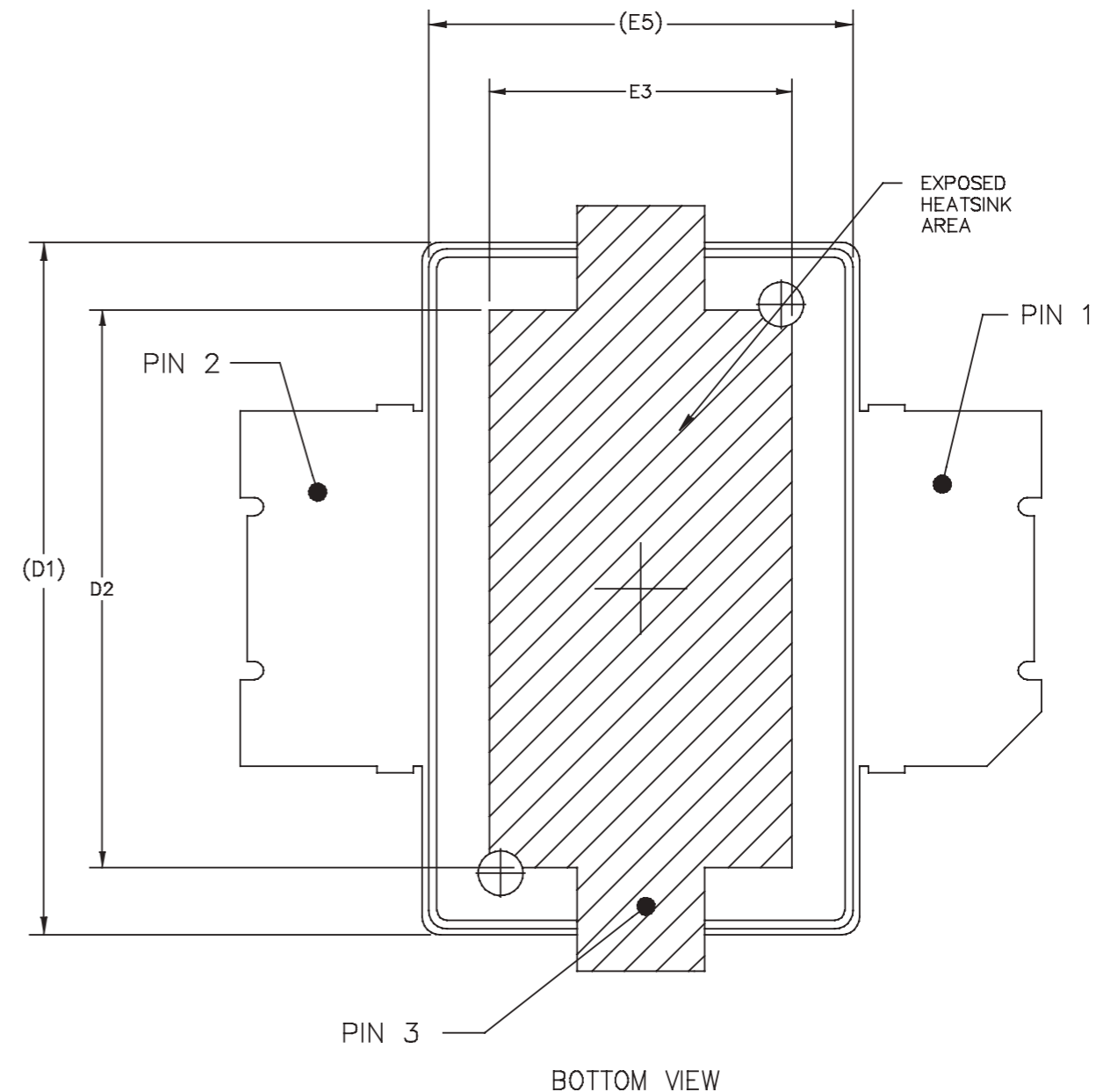
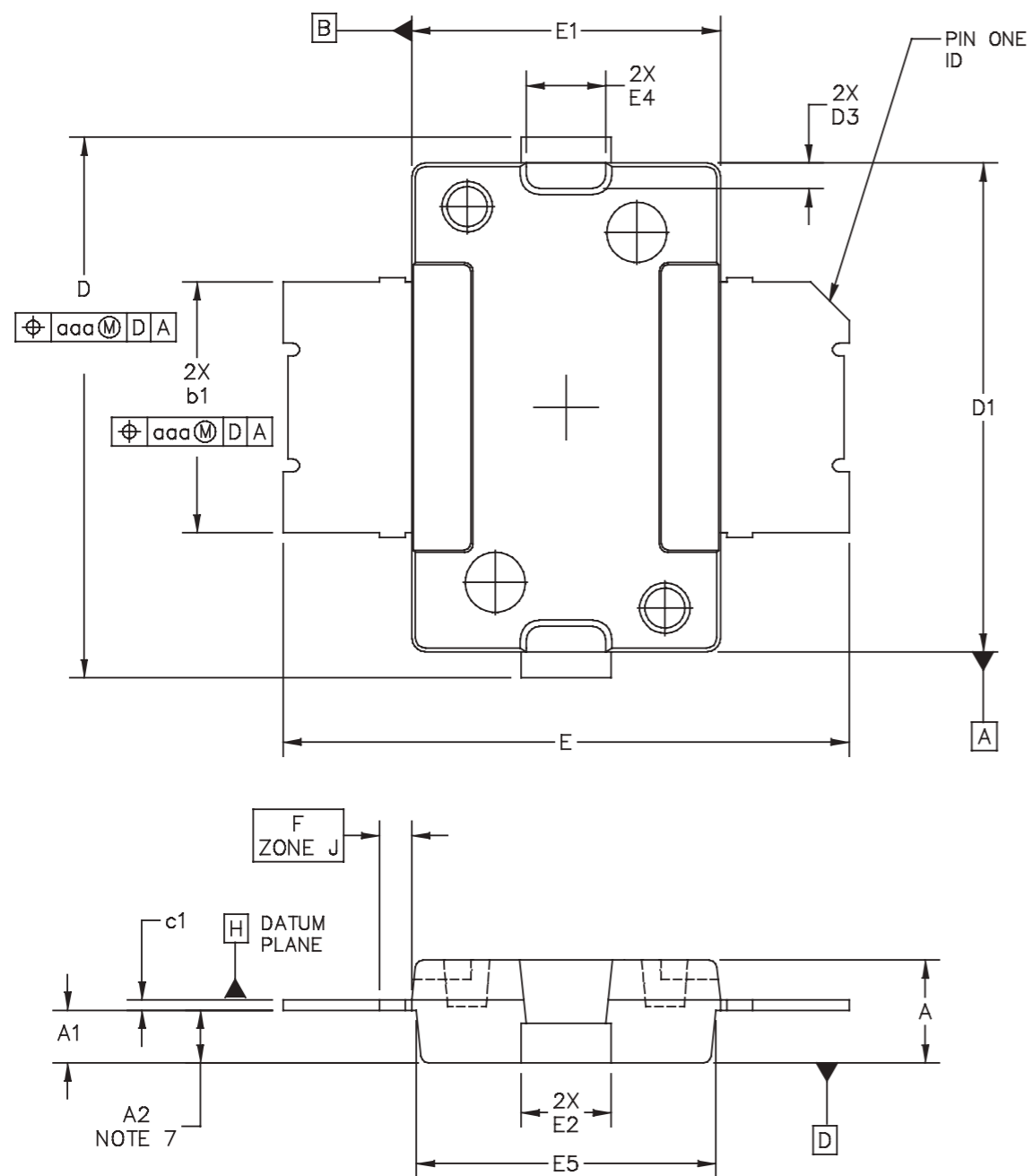
**Note:** MTTF value represents the total cumulative operating time under indicated test conditions.

**Figure 4. MTTF versus Junction Temperature - CW**

MRFE6VS25NR1

MRFE6VS25NR1

**PACKAGE DIMENSIONS**



**BOTTOM VIEW**

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TITLE: TO-270 SURFACE MOUNT	DOCUMENT NO: 98ASH98117A CASE NUMBER: 1265-09 STANDARD: JEDEC TO-270 AA	REV: K 29 JUN 2007

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TITLE: TO-270 SURFACE MOUNT	DOCUMENT NO: 98ASH98117A CASE NUMBER: 1265-09 STANDARD: JEDEC TO-270 AA	REV: K 29 JUN 2007

NOTES:

1. CONTROLLING DIMENSION: INCH
2. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
3. DATUM PLANE -H- IS LOCATED AT TOP OF LEAD AND IS COINCIDENT WITH THE LEAD WHERE THE LEAD EXITS THE PLASTIC BODY AT THE TOP OF THE PARTING LINE.
4. DIMENSIONS "D1" AND "E1" DO NOT INCLUDE MOLD PROTRUSION. ALLOWABLE PROTRUSION IS .006 PER SIDE. DIMENSIONS "D1" AND "E1" DO INCLUDE MOLD MISMATCH AND ARE DETERMINED AT DATUM PLANE -H-.
5. DIMENSION "b1" DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE .005 TOTAL IN EXCESS OF THE "b1" DIMENSION AT MAXIMUM MATERIAL CONDITION.
6. DATUMS -A- AND -B- TO BE DETERMINED AT DATUM PLANE -H-.
7. DIMENSION "A2" APPLIES WITHIN ZONE "J" ONLY.
8. DIMENSIONS "D" AND "E2" DO NOT INCLUDE MOLD PROTRUSION. OVERALL LENGTH INCLUDING MOLD PROTRUSION SHOULD NOT EXCEED 0.430 INCH FOR DIMENSION "D" AND 0.080 INCH FOR DIMENSION "E2". DIMENSIONS "D" AND "E2" DO INCLUDE MOLD MISMATCH AND ARE DETERMINED AT DATUM PLANE -D-.

STYLE 1:

- PIN 1 - DRAIN
- PIN 2 - GATE
- PIN 3 - SOURCE

DIM	INCH		MILLIMETER		DIM	INCH		MILLIMETER	
	MIN	MAX	MIN	MAX		MIN	MAX	MIN	MAX
A	.078	.082	1.98	2.08	F	.025 BSC		0.64 BSC	
A1	.039	.043	0.99	1.09	b1	.193	.199	4.90	5.06
A2	.040	.042	1.02	1.07	c1	.007	.011	0.18	0.28
D	.416	.424	10.57	10.77	aaa	.004		0.10	
D1	.378	.382	9.60	9.70					
D2	.290	----	7.37	----					
D3	.016	.024	0.41	0.61					
E	.436	.444	11.07	11.28					
E1	.238	.242	6.04	6.15					
E2	.066	.074	1.68	1.88					
E3	.150	----	3.81	----					
E4	.058	.066	1.47	1.68					
E5	.231	.235	5.87	5.97					

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TITLE:  TO-270 SURFACE MOUNT		DOCUMENT NO: 98ASH98117A	REV: K
		CASE NUMBER: 1265-09	29 JUN 2007
		STANDARD: JEDEC TO-270 AA	

PRODUCT DOCUMENTATION, SOFTWARE AND TOOLS

Refer to the following documents, software and tools to aid your design process.

Application Notes

- AN1907: Solder Reflow Attach Method for High Power RF Devices in Over-Molded Plastic Packages
- AN1955: Thermal Measurement Methodology of RF Power Amplifiers
- AN3263: Bolt Down Mounting Method for High Power RF Transistors and RFICs in Over-Molded Plastic Packages
- AN3789: Clamping of High Power RF Transistors and RFICs in Over-Molded Plastic Packages

Engineering Bulletins

- EB212: Using Data Sheet Impedances for RF LDMOS Devices
- EB38: Measuring the Intermodulation Distortion of Linear Amplifiers

Software

- Electromigration MTTF Calculator
- RF High Power Model
- .s2p File

Development Tools

- Printed Circuit Boards

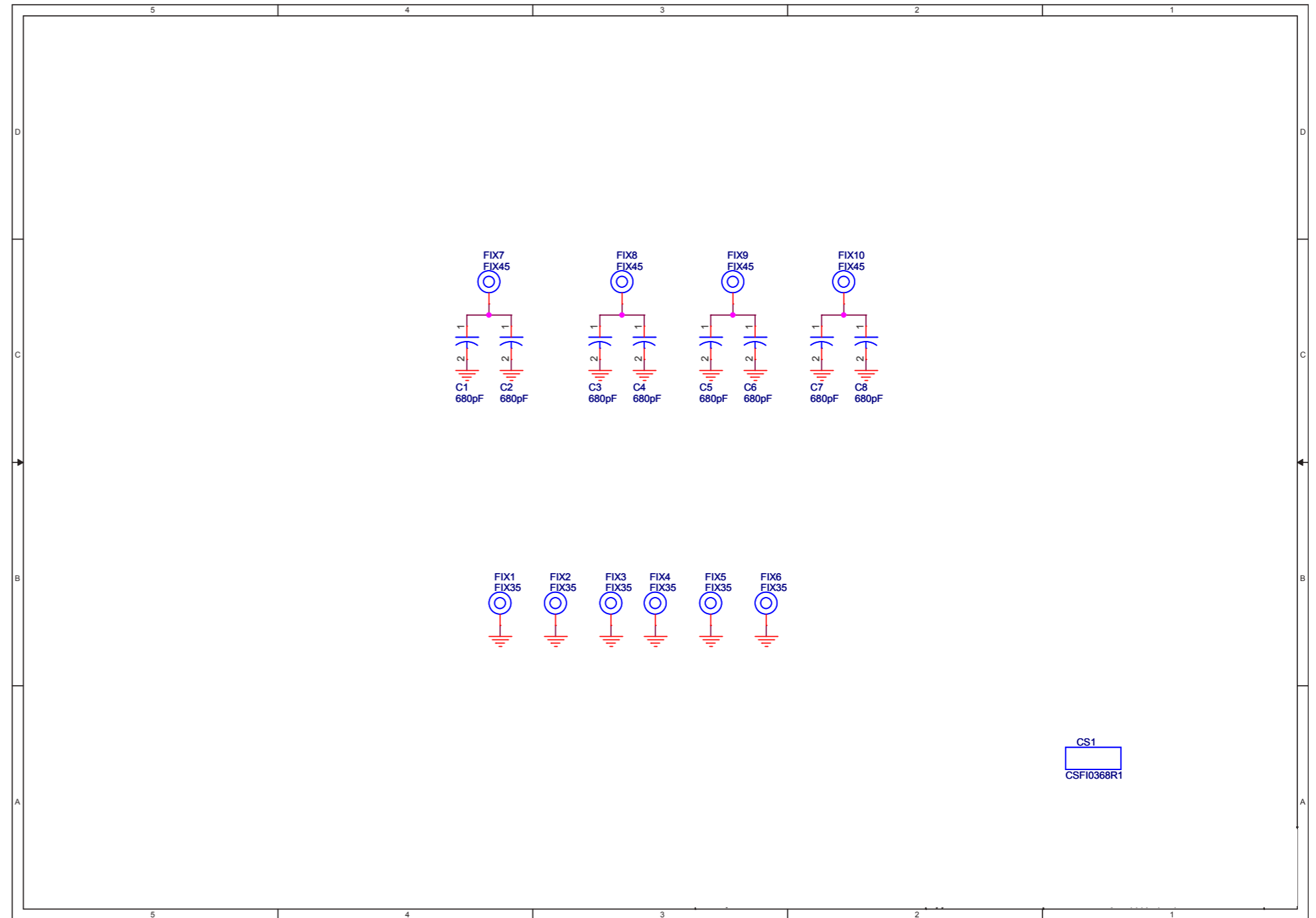
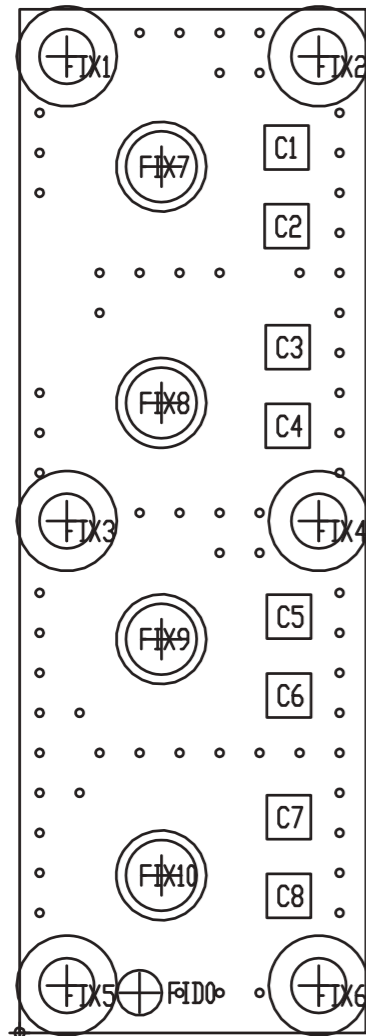
For Software and Tools, do a Part Number search at <http://www.freescale.com>, and select the "Part Number" link. Go to the Software & Tools tab on the part's Product Summary page to download the respective tool.

REVISION HISTORY

The following table summarizes revisions to this document.

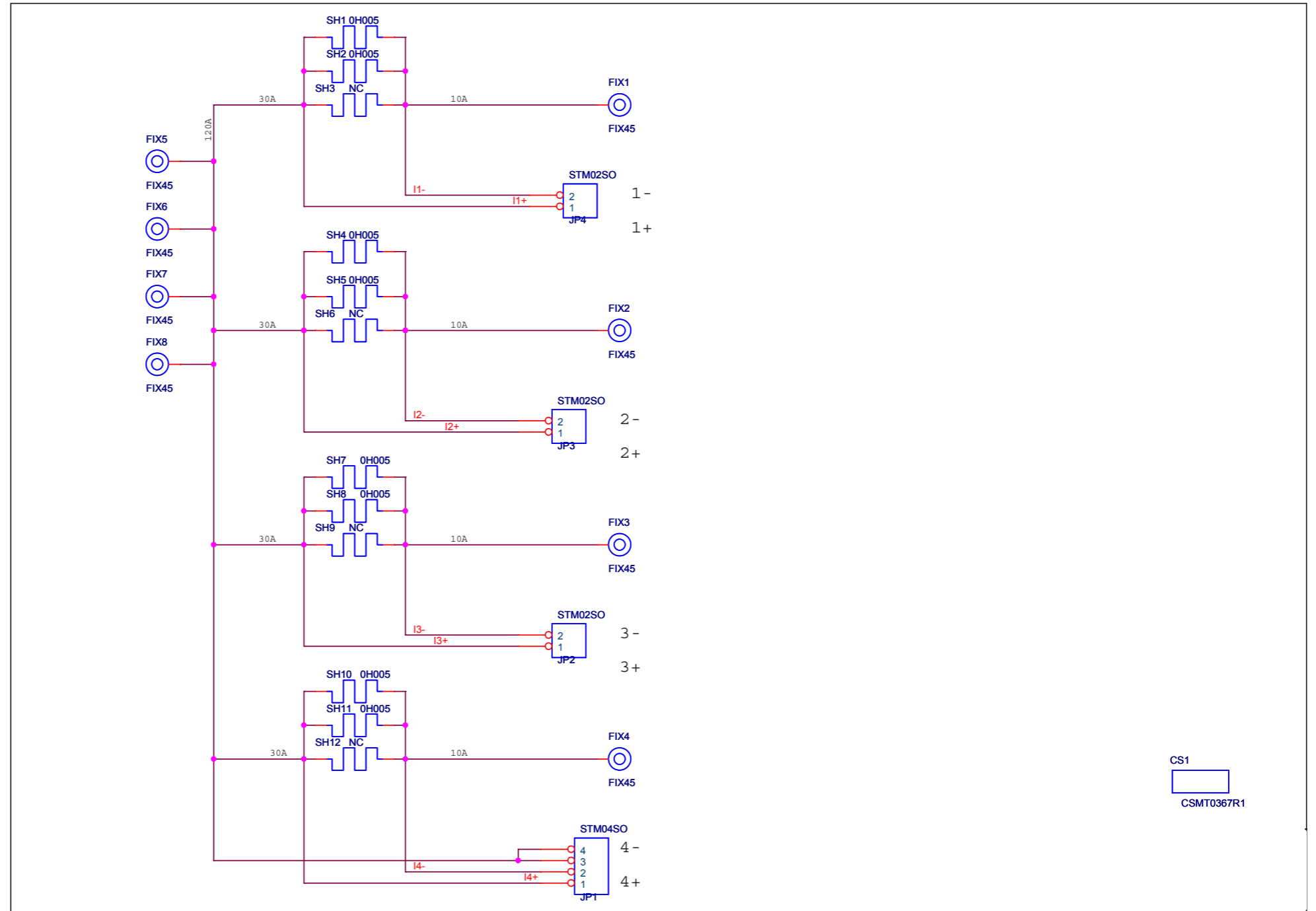
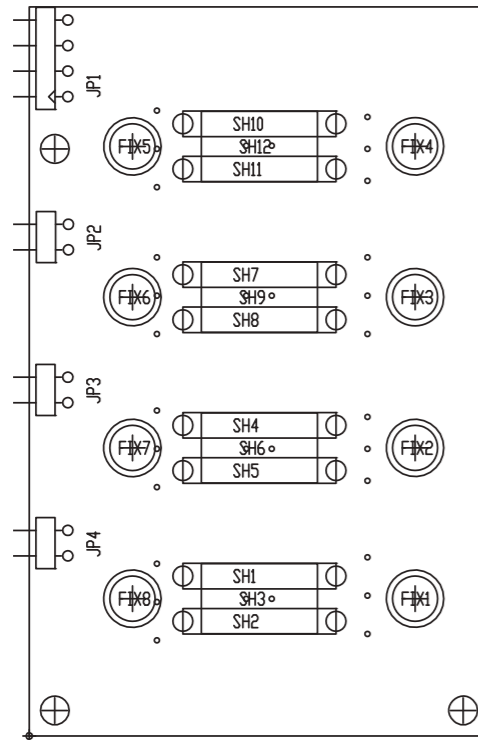
Revision	Date	Description
0	June 2012	• Initial Release of Data Sheet

Pass through board (SLFI0368R01V01)



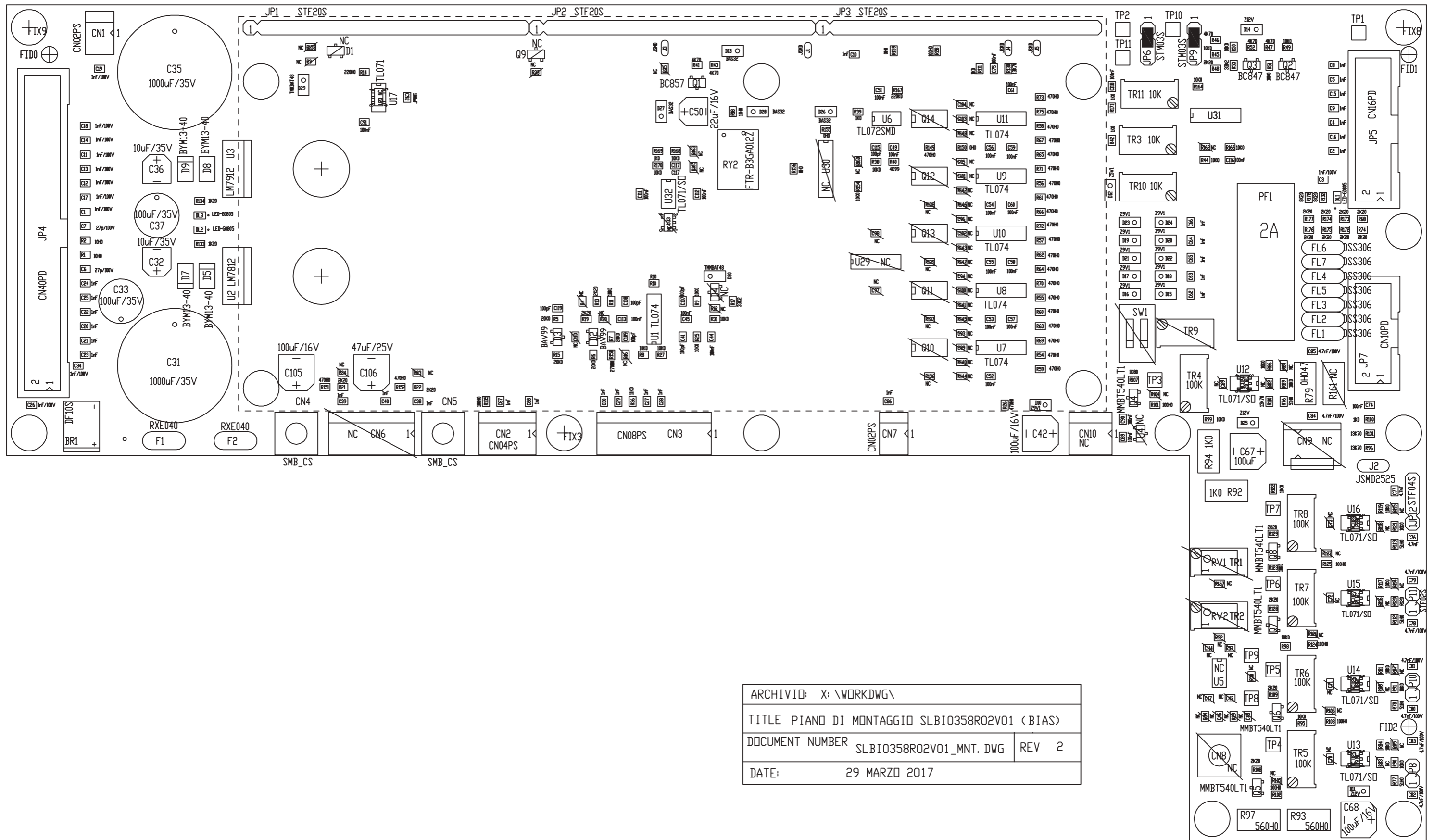
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1	1	CS1	CSFI0368R1
2	8	C1,C2,C3,C4,C5,C6,C7,C8	680pF
3	6	FIX1, FIX2, FIX3, FIX4, FIX5, FIX6	FIX35
4	4	FIX7, FIX8, FIX9, FIX10	FIX45

Shunt board (SLMT0367R01V01)



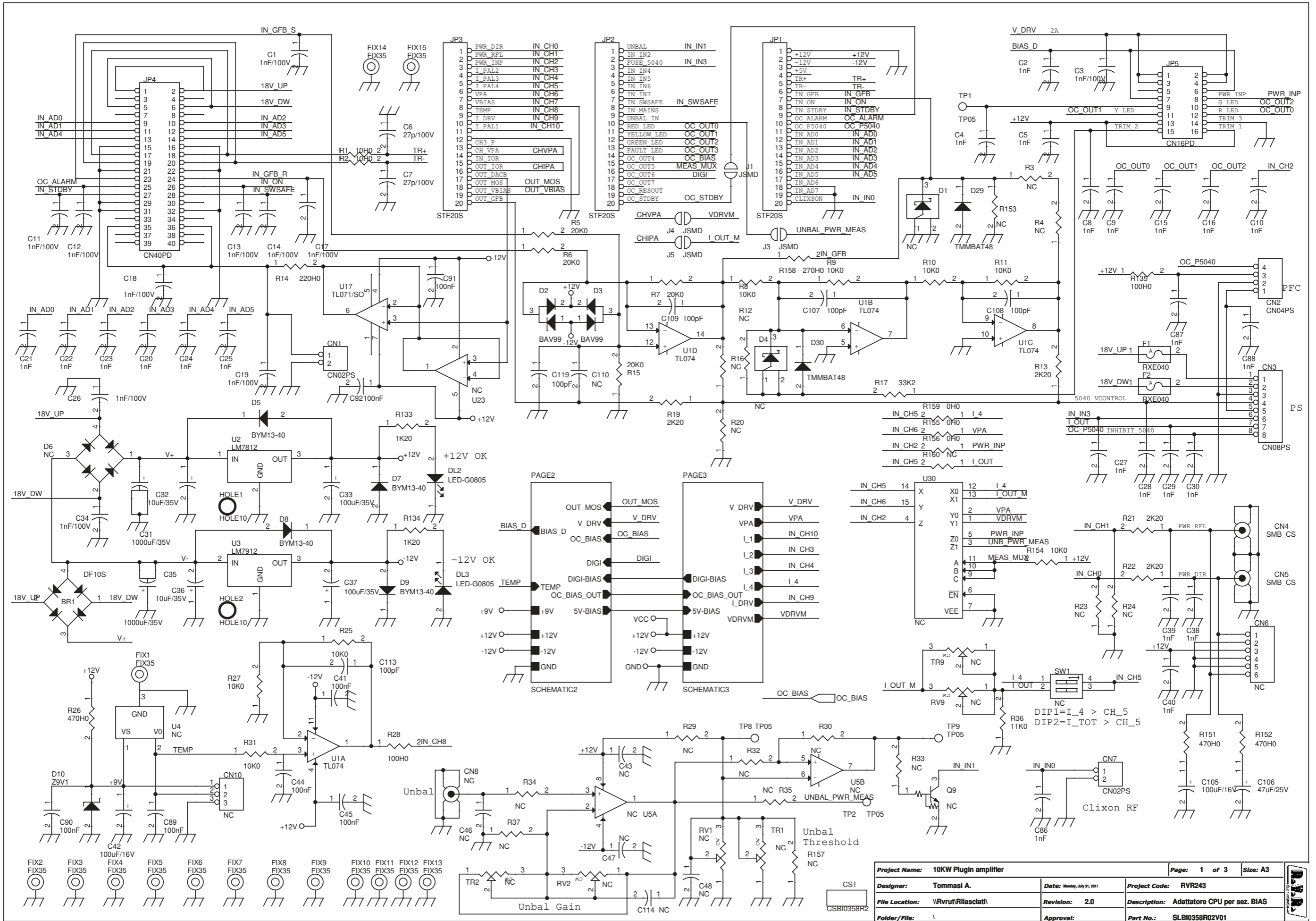
Item	Quantity	Reference	Part
1	1	CS1	CSMT0367R1
2	8	FIX1, FIX2, FIX3, FIX4, FIX5, FIX6, FIX7, FIX8	FIX45
3	1	JP1	STM04SO
4	3	JP2, JP3, JP4	STM02SO
5	8	SH1, SH2, SH4, SH5, SH7, SH8, SH10, SH11	OH005
6	4	SH3, SH6, SH9, SH12	NC

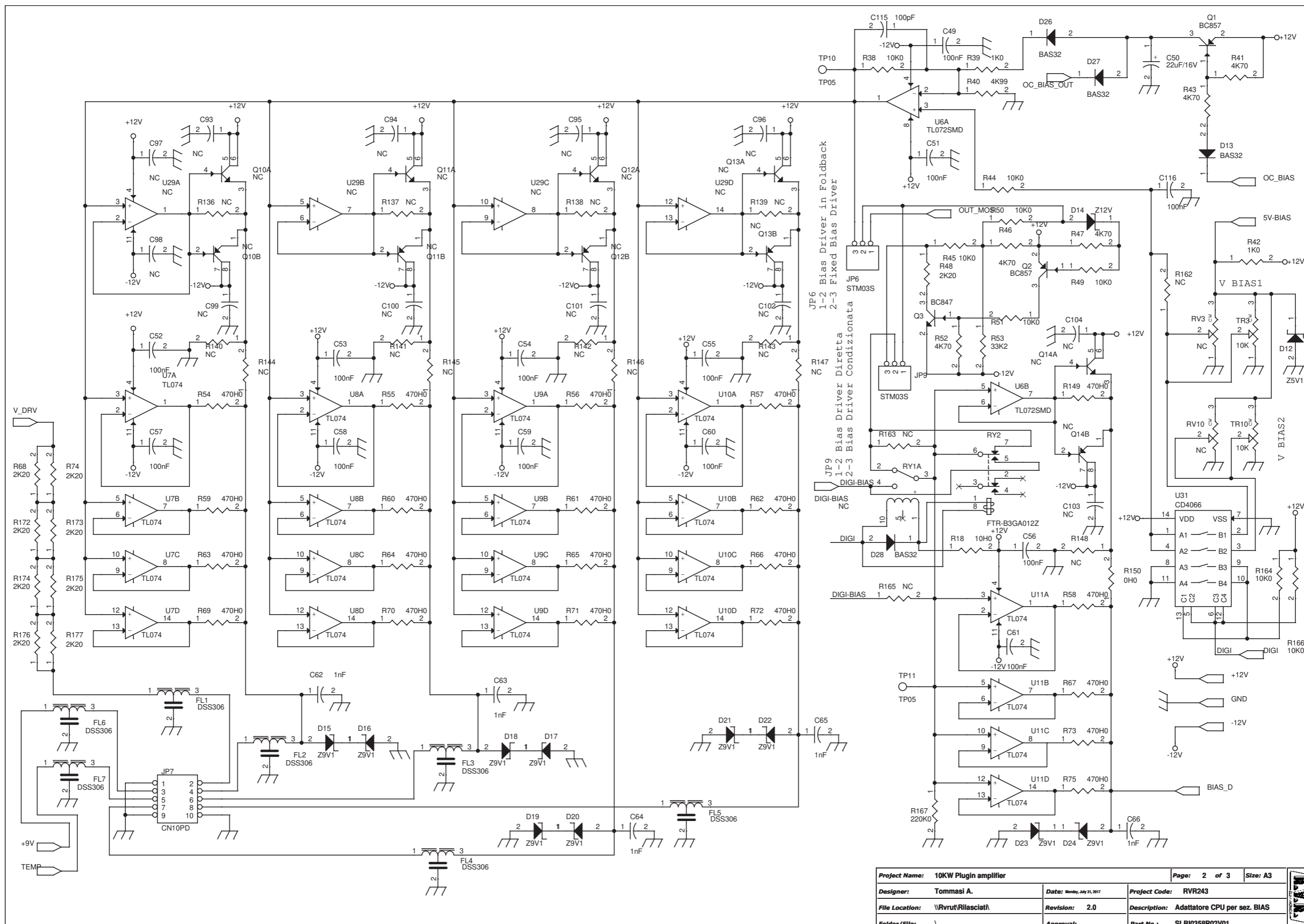
# Bias board (SLBI0358R02V01)

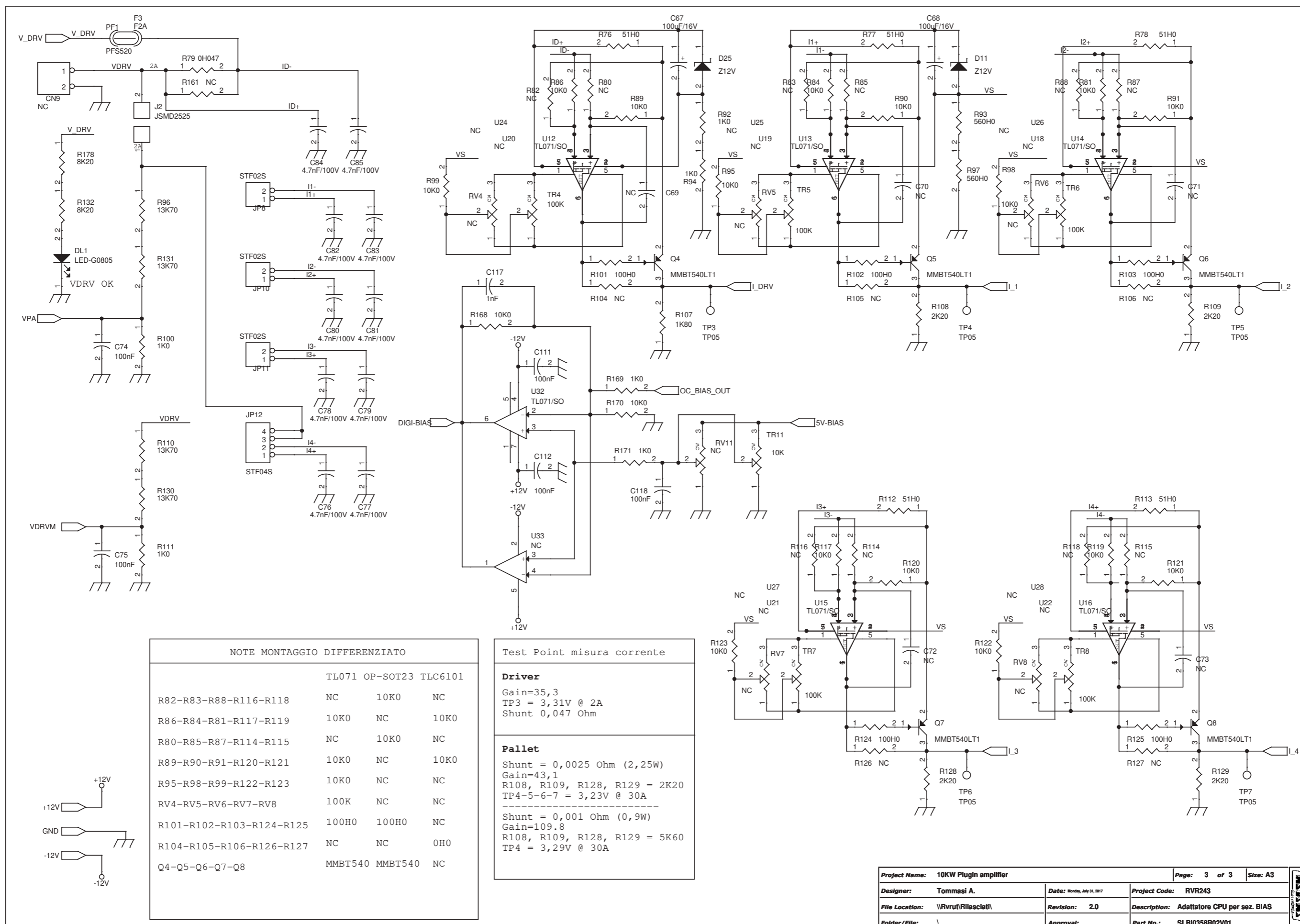


ARCHIVIO: X:\WORKDWG\	
TITLE PIANO DI MONTAGGIO SLBI0358R02V01 (BIAS)	
DOCUMENT NUMBER	SLBI0358R02V01_MNT.DWG REV 2
DATE:	29 MARZO 2017









NOTE MONTAGGIO DIFFERENZIATO

Component	Value	Value	Value
	TL071	OP-SOT23	TLC6101
R82-R83-R88-R116-R118	NC	10K0	NC
R86-R84-R81-R117-R119	10K0	NC	10K0
R80-R85-R87-R114-R115	NC	10K0	NC
R89-R90-R91-R120-R121	10K0	NC	10K0
R95-R98-R99-R122-R123	10K0	NC	NC
RV4-RV5-RV6-RV7-RV8	100K	NC	NC
R101-R102-R103-R124-R125	100H0	100H0	NC
R104-R105-R106-R126-R127	NC	NC	0H0
Q4-Q5-Q6-Q7-Q8	MMBT540	MMBT540	NC

Test Point misura corrente

**Driver**  
 Gain=35,3  
 TP3 = 3,31V @ 2A  
 Shunt 0,047 Ohm

**Pallet**  
 Shunt = 0,0025 Ohm (2,25W)  
 Gain=43,1  
 R108, R109, R128, R129 = 2K20  
 TP4-5-6-7 = 3,23V @ 30A

---

Shunt = 0,001 Ohm (0,9W)  
 Gain=109.8  
 R108, R109, R128, R129 = 5K60  
 TP4 = 3,29V @ 30A

Project Name: 10KW Plug-in amplifier	Date: Monday, July 31, 2017	Page: 3 of 3	Size: A3
Designer: Tommasi A.	Revision: 2.0	Project Code: RVR243	
File Location: \\Rvrut\Rilasciati\	Approval:	Description: Adattatore CPU per sez. BIAS	
Folder/File:		Part No.: SLBI0358R02V01	

Adattatore CPU per sez. BIAS Revised: Monday, July 31, 2017  
 SLBI0358R02V01 Revision: 2.0

10KW Plugin amplifier  
 RVR243

Tommasi A.

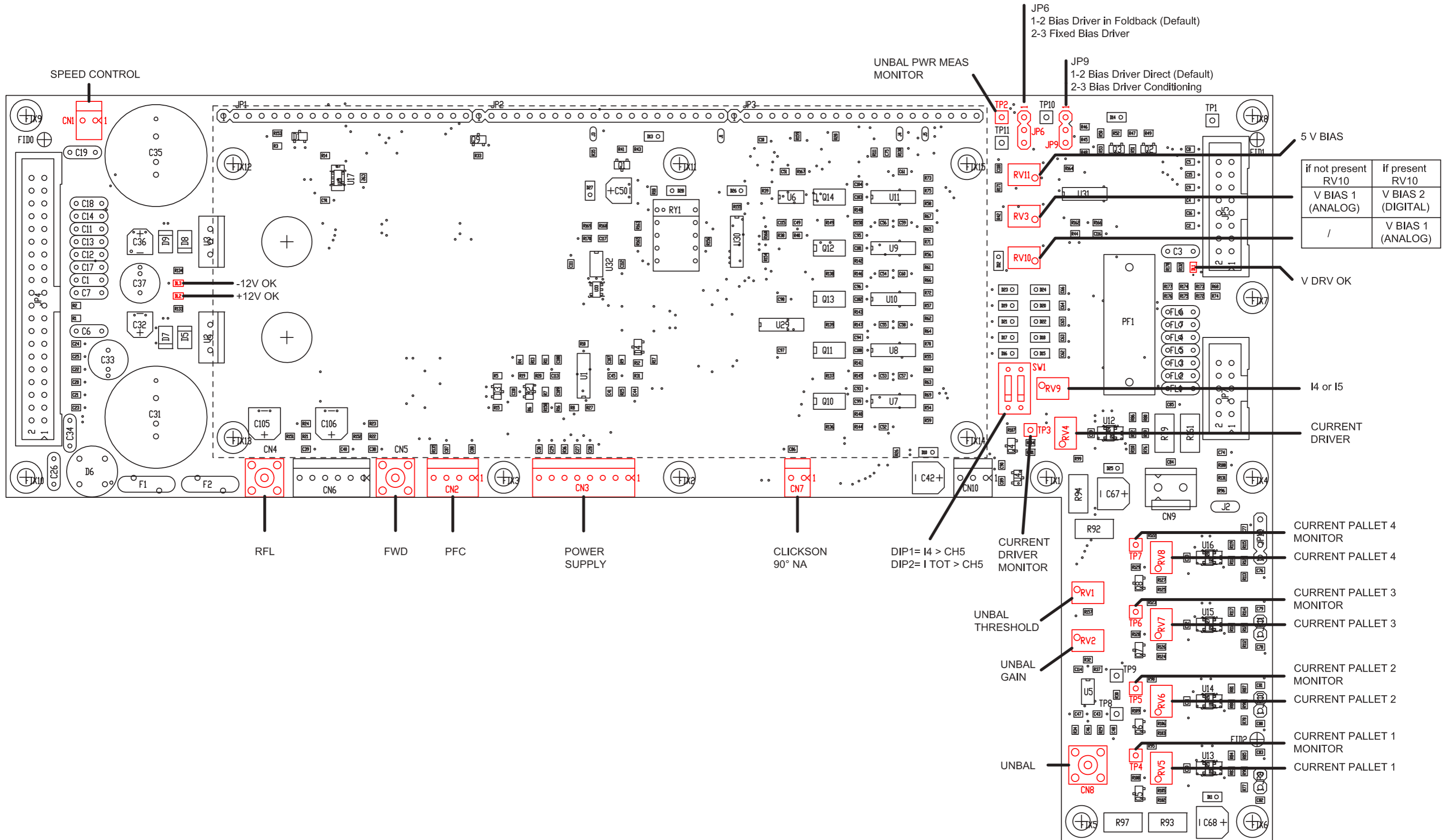
Bill Of Materials May 8,2019 17:43:42 Page1

Item	Quantity	Reference	Part
1	1	BR1	DF10S
2	2	CN1,CN7	CN02PS
3	1	CN2	CN04PS
4	1	CN3	CN08PS
5	2	CN4,CN5	SMB_CS
6	117	TR1, SW1, RY1, RV1, D1, TR2, RV2, RV3, R3, U4, RV4, R4, D4, U5, RV5, RV6, D6, CN6, RV7, RV8, CN8, TR9, RV9, Q9, CN9, RV10, Q10, CN10, RV11, Q11, R12, Q12, Q13, Q14, R16, U18, U19, U20, R20, U21, U22, U23, R23, U24, R24, U25, U26, U27, U28, U29, R29, U30, R30, R32, U33, R33, R34, R35, R37, C43, C46, C47, C48, C69, C70, C71, C72, C73, R80, R82, R83, R85, R87, R88, C93, C94, C95, C96, C97, C98, C99, C100, C101, C102, C103, R104, C104, R105, R106, C110, R114, C114, R115, R116, R118, R126, R127, R136, R137, R138, R139, R140, R141, R142, R143, R144, R145, R146, R147, R148, R153, R157, R160, R161, R162, R163, R165	NC
7	1	CS1	CSBI0358R2
8	11	C1, C3, C11, C12, C13, C14, C17, C18, C19, C26, C34	1nF/100V
9	30	C2, C4, C5, C8, C9, C10, C15, C16, C20, C21, C22, C23, C24, C25, C27, C28, C29, C30, C38, C39, C40, C62, C63, C64, C65, C66, C86, C87, C88, C117	1nF
10	2	C6, C7	27p/100V
11	2	C31, C35	1000uF/35V
12	2	C32, C36	10uF/35V
13	2	C33, C37	100uF/35V
14	6	C41, C107, C108, C109, C115, C119	100pF
15	4	C42, C67, C68, C105	100uF/16V
16	25	C44, C45, C49, C51, C52, C53, C54, C55, C56, C57, C58, C59,	100nF

17	1	C50	22uF/16V
18	10	C76, C77, C78, C79, C80, C81, C82, C83, C84, C85	4.7nF/100V
19	1	C106	47uF/25V
20	3	DL1, DL2, DL3	LED-G0805
21	2	D2, D3	BAV99
22	4	D5, D7, D8, D9	BYM13-40
23	11	D10, D15, D16, D17, D18, D19, D20, D21, D22, D23, D24	Z9V1
24	3	D11, D14, D25	Z12V
25	1	D12	Z5V1
26	4	D13, D26, D27, D28	BAS32
27	2	D29, D30	TMMBAT48
28	15	FIX1, FIX2, FIX3, FIX4, FIX5, FIX6, FIX7, FIX8, FIX9, FIX10, FIX11, FIX12, FIX13, FIX14, FIX15	FIX35
29	7	FL1, FL2, FL3, FL4, FL5, FL6, FL7	DSS306
30	2	F1, F2	RXE040
31	1	F3	F2A
32	2	HOLE1, HOLE2	HOLE10
33	3	JP1, JP2, JP3	STF20S
34	1	JP4	CN40PD
35	1	JP5	CN16PD
36	2	JP6, JP9	STM03S
37	1	JP7	CN10PD
38	3	JP8, JP10, JP11	STF02S
39	1	JP12	STF04S
40	4	J1, J3, J4, J5	JSMD
41	1	J2	JSMD2525
42	1	PF1	PFS520
43	2	Q1, Q2	BC857
44	1	Q3	BC847
45	5	Q4, Q5, Q6, Q7, Q8	MMBT540LT1
46	1	RY2	FTR-B3GA012Z
47	3	R1, R2, R18	10H0
48	4	R5, R6, R7, R15	20K0
49	33	R8, R9, R10, R11, R25, R27, R31, R38, R44, R45, R49, R50, R51, R81, R84, R86, R89, R90, R91, R95, R98, R99, R117, R119, R120, R121, R122, R123, R154, R164, R166, R168, R170	10K0
50	17	R13, R19, R21, R22, R48, R68, R74, R108, R109, R128, R129, R172, R173, R174, R175, R176, R177	2K20
51	1	R14	220H0
52	2	R17, R53	33K2
53	24	R26, R54, R55, R56, R57, R58, R59, R60, R61, R62, R63, R64, R65, R66, R67, R69, R70, R71, R72, R73, R75, R149, R151,	470H0

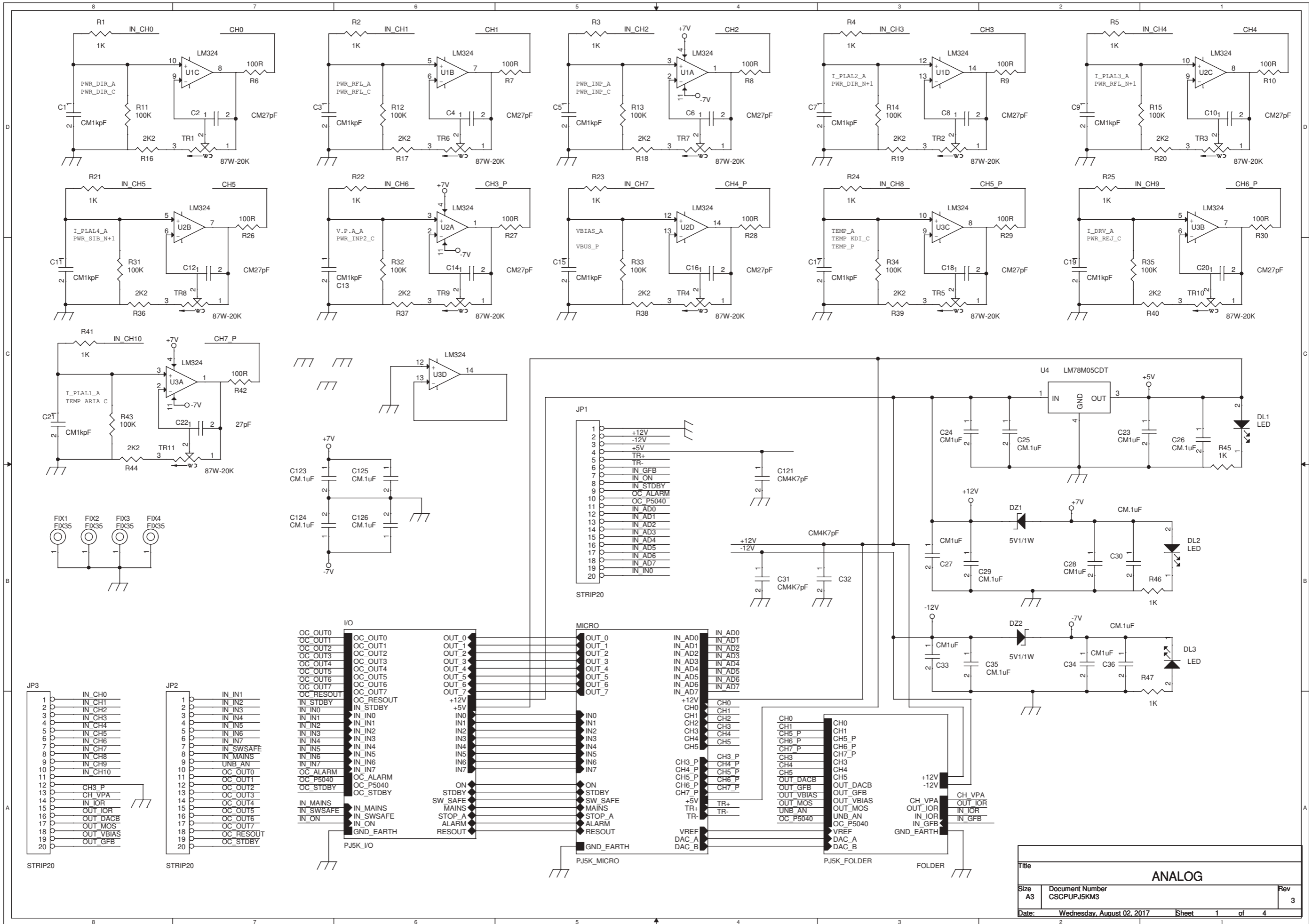
54	7	R152, R28, R101, R102, R103, R124, R125, R135	100H0
55	1	R36	11K0
56	8	R39, R42, R92, R94, R100, R111, R169, R171	1K0
57	1	R40	4K99
58	5	R41, R43, R46, R47, R52	4K70
59	5	R76, R77, R78, R112, R113	51H0
60	1	R79	0H047
61	2	R93, R97	560H0
62	4	R96, R110, R130, R131	13K70
63	1	R107	1K80
64	2	R132, R178	8K20
65	2	R133, R134	1K20
66	4	R150, R155, R156, R159	0H0
67	1	R158	270H0
68	1	R167	220K0
69	11	TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8, TP9, TP10, TP11	TP05
70	3	TR3, TR10, TR11	10K
71	5	TR4, TR5, TR6, TR7, TR8	100K
72	6	U1, U7, U8, U9, U10, U11	TL074
73	1	U2	LM7812
74	1	U3	LM7912
75	1	U6	TL072SMD
76	7	U12, U13, U14, U15, U16, U17, U32	TL071/SO
77	1	U31	CD4066

# Bias doard Settings

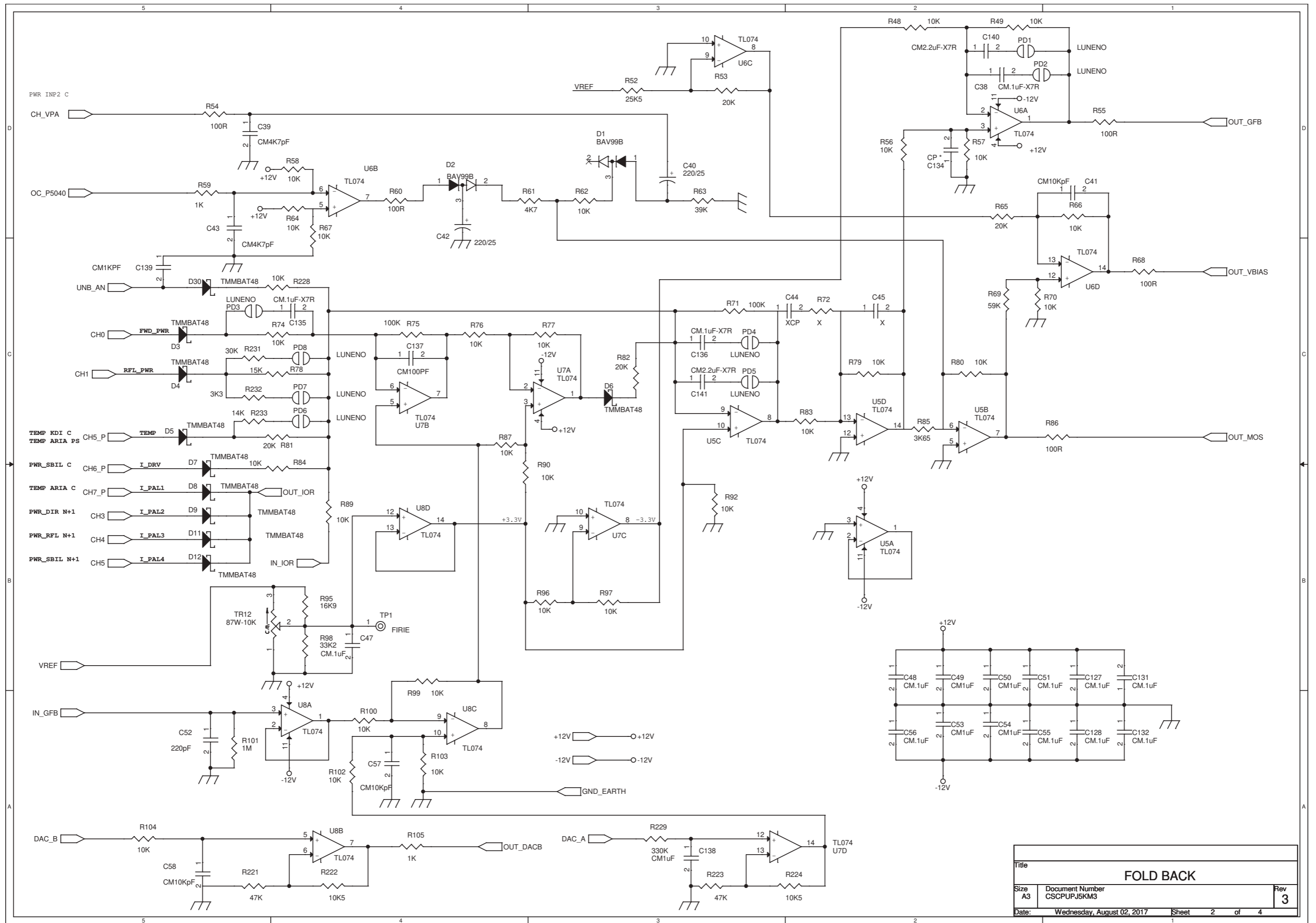


if not present RV10	if present RV10
V BIAS 1 (ANALOG)	V BIAS 2 (DIGITAL)
/	V BIAS 1 (ANALOG)



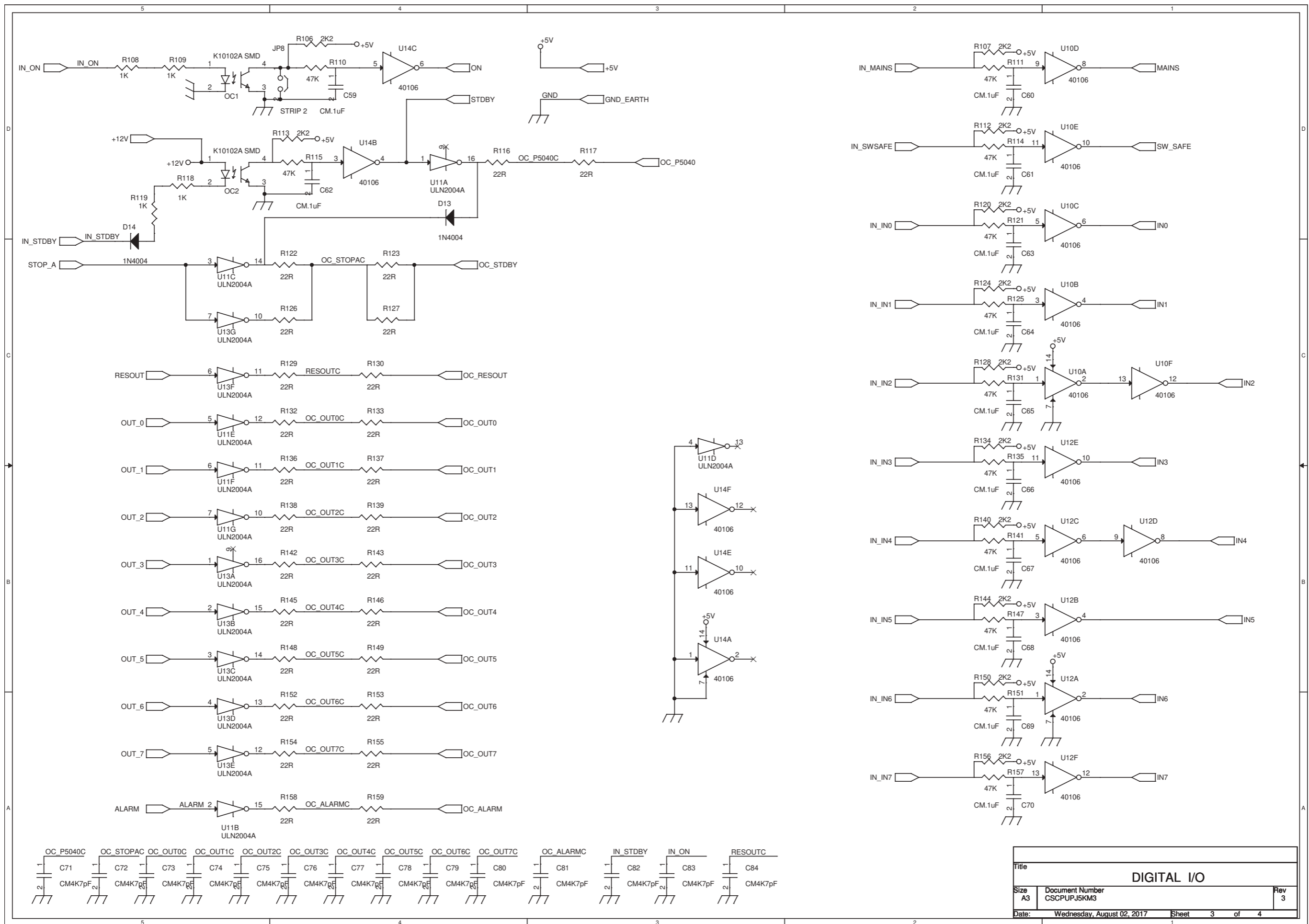


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Size	Document Number	Rev
A3	CSCPUPJ5KM3	3
Date:	Wednesday, August 02, 2017	Sheet 1 of 4

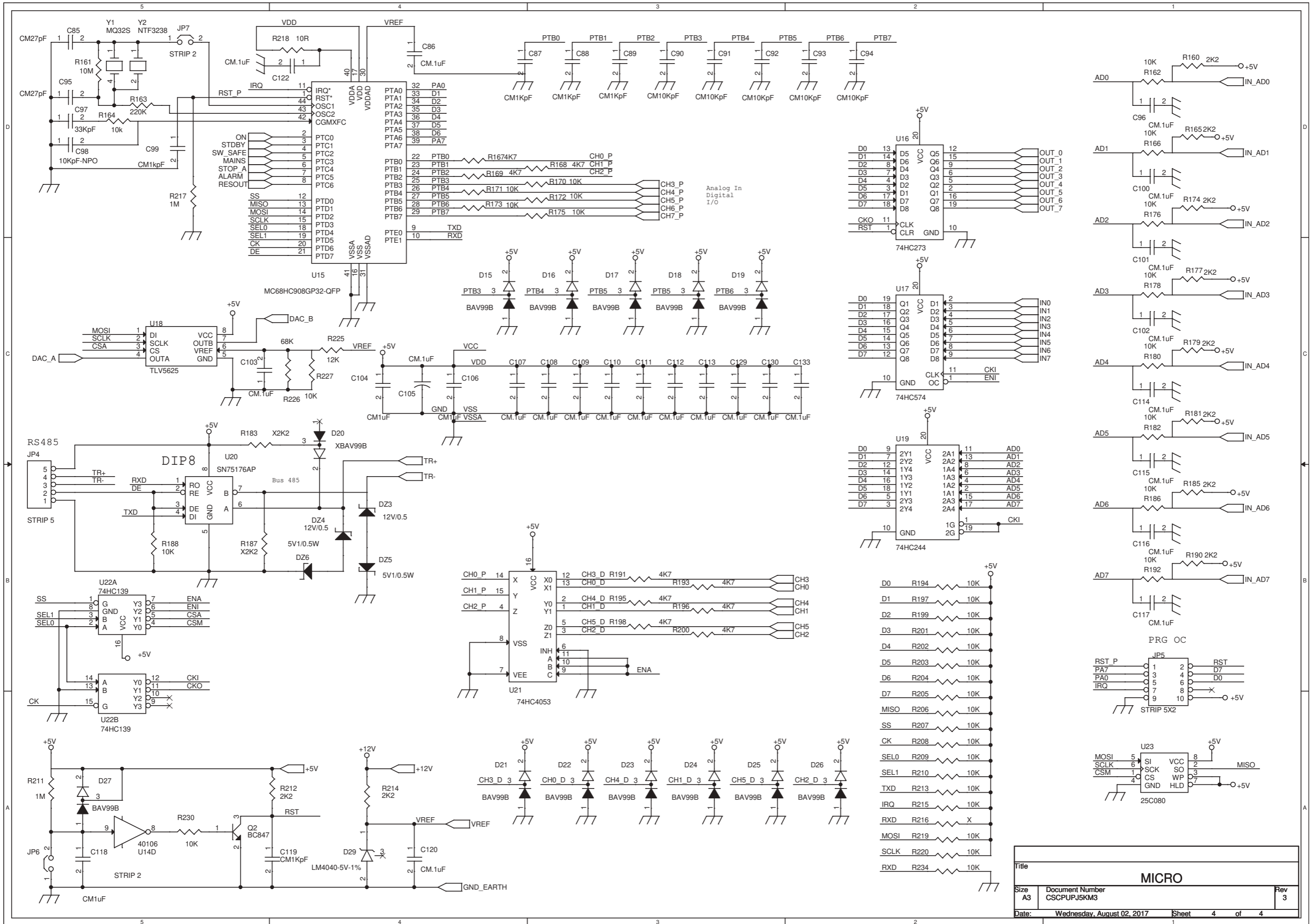


Title			<b>FOLD BACK</b>		
Size	Document Number				Rev
A3	CSCPUPJ5KM3				3
Date:	Wednesday, August 02, 2017	Sheet	2	of	4





Title			DIGITAL I/O		
Size	Document Number				Rev
A3	CSCPUPJ5KM3				3
Date:	Wednesday, August 02, 2017	Sheet	3	of	4



ANALOG Revised: Wednesday, August 02, 2017  
 CSCPUPJ5KM3 Revision: 3

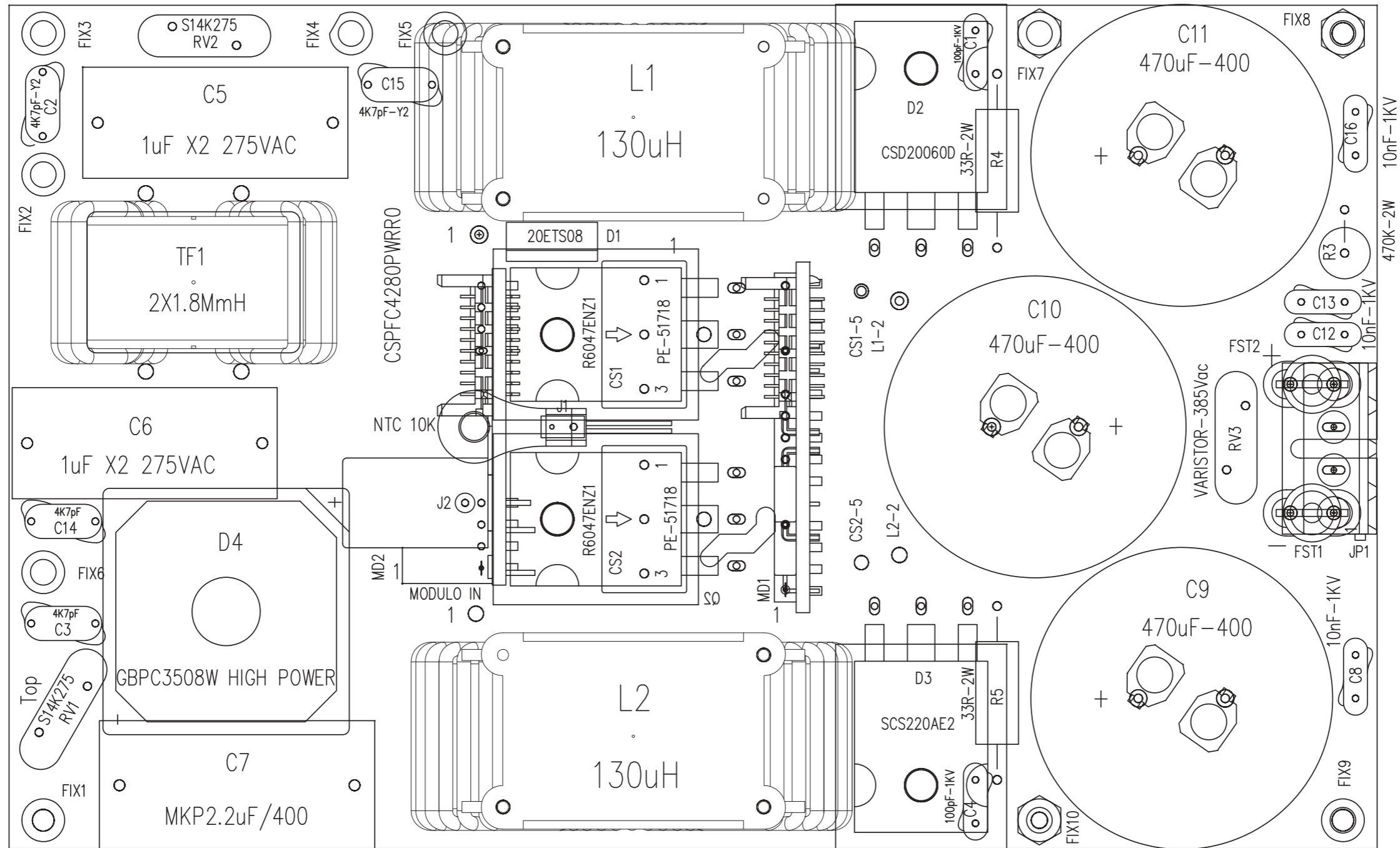
Bill Of Materials May 9, 2019 9:25:37 Page1

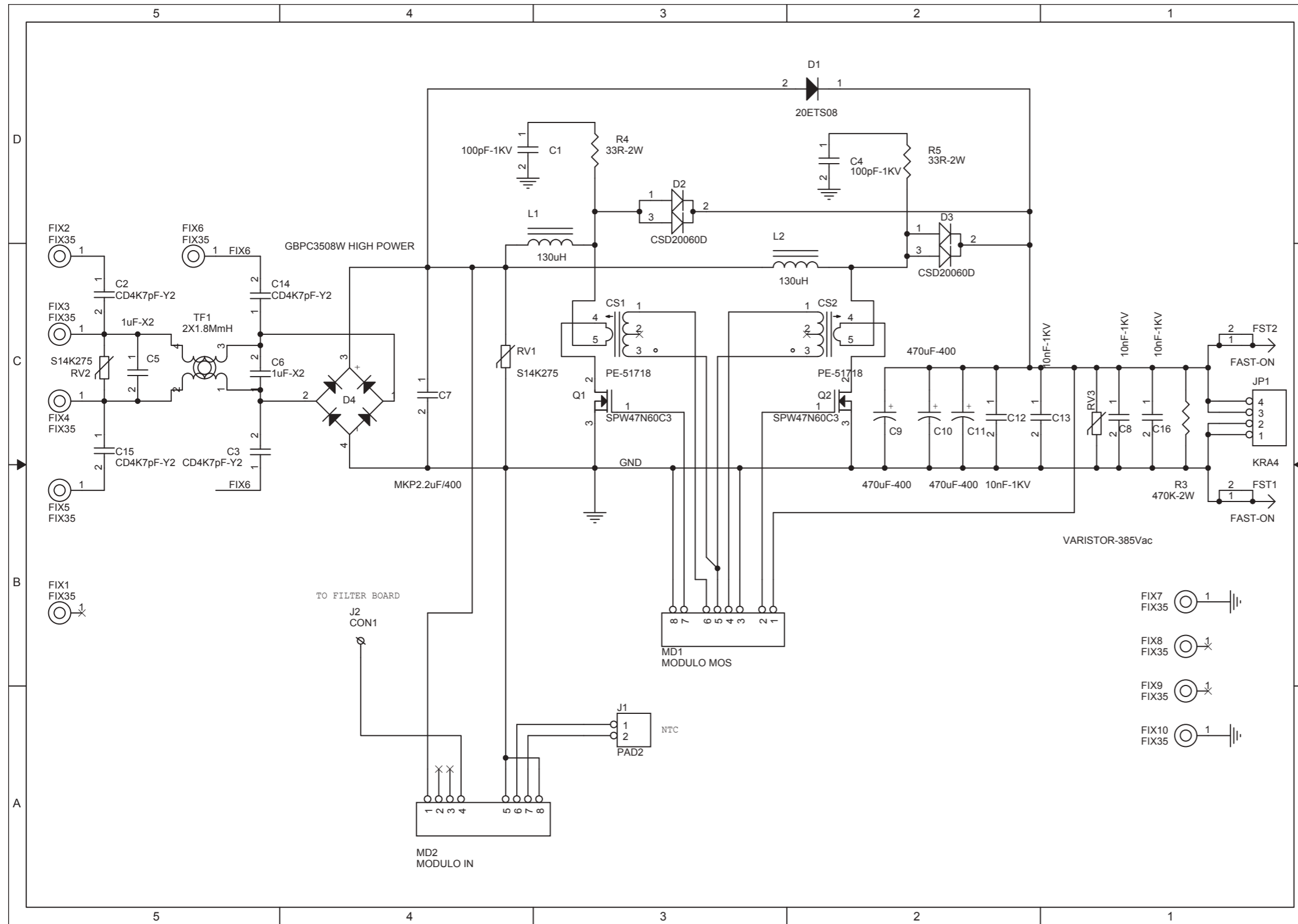
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1	17	C1, C3, C5, C7, C9, C11, C13, C15, C17, C19, C21, C87, C88, C89, C99, C119, C139	CM1kpF
2	12	C2, C4, C6, C8, C10, C12, C14, C16, C18, C20, C85, C95	CM27pF
3	1	C22 27pF	
4	14	C23, C24, C27, C28, C33, C34, C49, C50, C53, C54, C104, C106, C118, C138	CM1uF
5	54	C25, C26, C29, C30, C35, C36, C47, C48, C51, C55, C56, C59, C60, C61, C62, C63, C64, C65, C66, C67, C68, C69, C70, C86, C96, C100, C101, C102, C103, C105, C107, C108, C109, C110, C111, C112, C113, C114, C115, C116, C117, C120, C122, C123, C124, C125, C126, C127, C128, C129, C130, C131, C132, C133	CM.1uF
6	19	C31, C32, C39, C43, C71, C72, C73, C74, C75, C76, C77, C78, C79, C80, C81, C82, C83, C84, C121	CM4K7pF
7	3	C38, C135, C136	CM.1uF-X7R
8	2	C40, C42	220/25
9	8	C41, C57, C58, C90, C91, C92, C93, C94	CM10KpF
10	1	C44	XCP
11	3	C45, R72, R216	X
12	1	C52	220pF
13	1	C97	33KpF
14	1	C98	10KpF-NPO
15	1	C134	CP *
16	1	C137	CM100PF
17	2	C140, C141	CM2.2uF-X7R
18	3	DL1, DL2, DL3	LED
19	2	DZ1, DZ2	5V1/1W
20	2	DZ3, DZ4	12V/0.5
21	2	DZ5, DZ6	5V1/0.5W
22	14	D1, D2, D15, D16, D17, D18, D19, D21, D22, D23, D24, D25, D26, D27	BAV99B
23	10	D3, D4, D5, D6, D7, D8, D9, D11,	TMMBAT48

24	2	D12, D30	
25	1	D13, D14 1N4004	
26	1	D20 XBAV99B	
27	4	D29 LM4040-5V-1%	
28	3	FIX1, FIX2, FIX3, FIX4 FIX35	
29	1	JP1, JP2, JP3 STRIP20	
30	1	JP4 STRIP 5	
31	3	JP5 STRIP 5X2	
32	2	JP6, JP7, JP8 STRIP 2	
33	8	OC1, OC2 K10102A SMD	
34	1	PD1, PD2, PD3, PD4, PD5, PD6, PD7, PD8	LUNENO
35	20	Q2 BC847	
36	16	R1, R2, R3, R4, R5, R21, R22, R23, R24, R25, R41, R45, R46, R47, R59, R105, R108, R109, R118, R119	1K
37	13	R6, R7, R8, R9, R10, R26, R27, R28, R29, R30, R42, R54, R55, R60, R68, R86	100R
38	33	R11, R12, R13, R14, R15, R31, R32, R33, R34, R35, R43, R71, R75	100K
39	64	R16, R17, R18, R19, R20, R36, R37, R38, R39, R40, R44, R106, R107, R112, R113, R120, R124, R128, R134, R140, R144, R150, R156, R160, R165, R174, R177, R179, R181, R185, R190, R212, R214	2K2
40	1	R48, R49, R56, R57, R58, R62, R64, R66, R67, R70, R74, R76, R77, R79, R80, R83, R84, R87, R89, R90, R92, R96, R97, R99, R100, R102, R103, R104, R162, R164, R166, R170, R171, R172, R173, R175, R176, R178, R180, R182, R186, R188, R192, R194, R197, R199, R201, R202, R203, R204, R205, R206, R207, R208, R209, R210, R213, R215, R219, R220, R227, R228, R230, R234	10K
41	4	R52 25K5	
42	10	R53, R65, R81, R82 20K	
43	1	R61, R167, R168, R169, R191, R193, R195, R196, R198, R200	4K7
44	1	R63 39K	
45	1	R69 59K	
46	1	R78 15K	
47	1	R85 3K65	
48	1	R95 16K9	
49	3	R98 33K2	
50	14	R101, R211, R217 1M	
51	26	R110, R111, R114, R115, R121, R125, R131, R135, R141, R147, R151, R157, R221, R223	47K
		R116, R117, R122, R123, R126,	22R

52	1	R127, R129, R130, R132, R133, R136, R137, R138, R139, R142, R143, R145, R146, R148, R149, R152, R153, R154, R155, R158, R159	
53	1	R161 10M	
54	2	R163 220K	
55	1	R183, R187 X2K2	
56	2	R218 10R	
57	1	R222, R224 10K5	
58	1	R225 12K	
59	1	R226 68K	
60	1	R229 330K	
61	1	R231 30K	
62	1	R232 3K3	
63	1	R233 14K	
64	11	TP1 FIRIE	
65	1	TR1, TR2, TR3, TR4, TR5, TR6, TR7, TR8, TR9, TR10, TR11	87W-20K
66	3	TR12 87W-10K	
67	1	U1, U2, U3 LM324	
68	4	U4 LM78M05CDT	
69	3	U5, U6, U7, U8 TL074	
70	2	U10, U12, U14 40106	
71	1	U11, U13 ULN2004A	
72	1	U15 MC68HC908GP32-QFP	
73	1	U16 74HC273	
74	1	U17 74HC574	
75	1	U18 TLV5625	
76	1	U19 74HC244	
77	1	U20 SN75176AP	
78	1	U21 74HC4053	
79	1	U22 74HC139	
80	1	U23 25C080	
81	1	Y1 MQ32S	
		Y2 NTF3238	

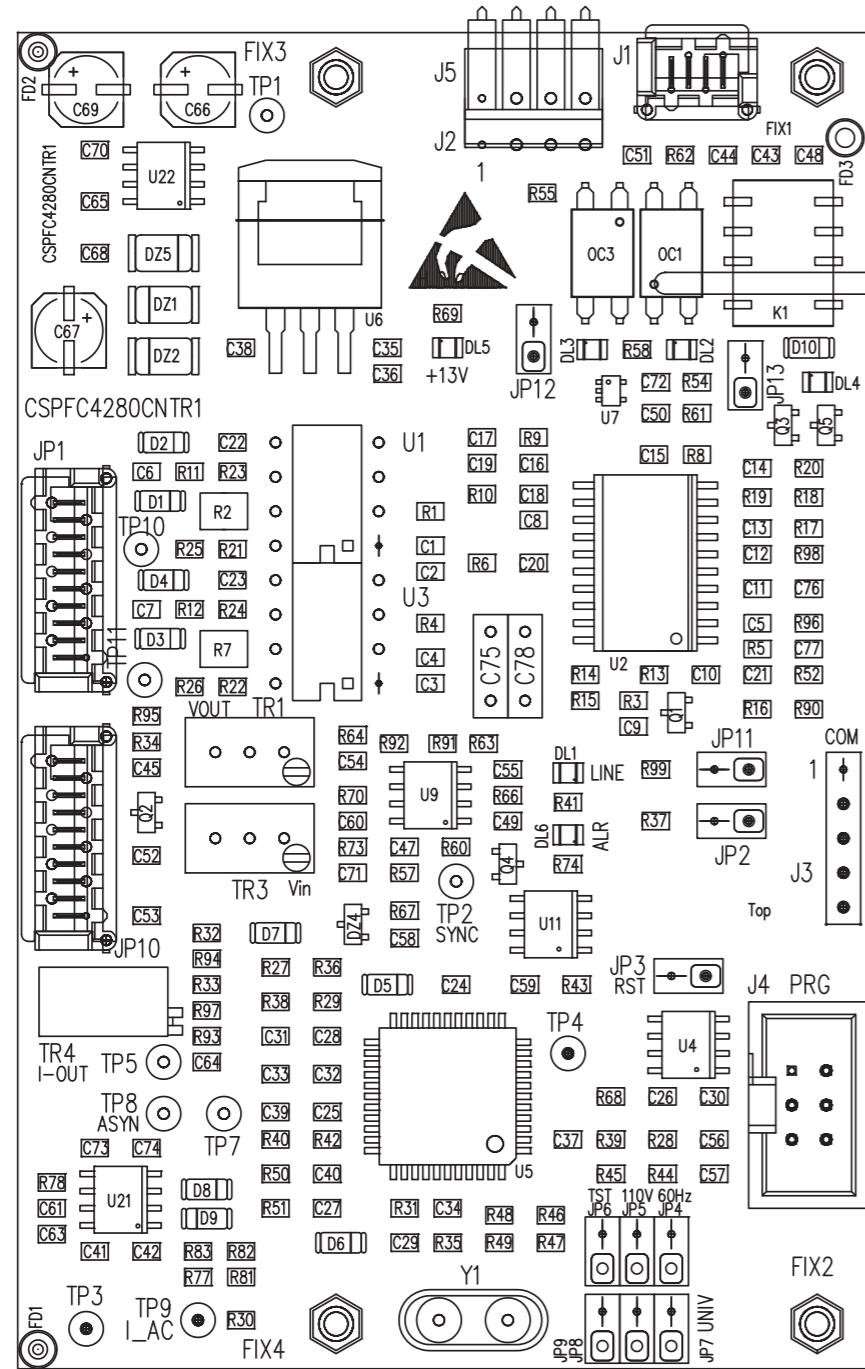
**PFC (KPFPCSL4280HS.LC)**



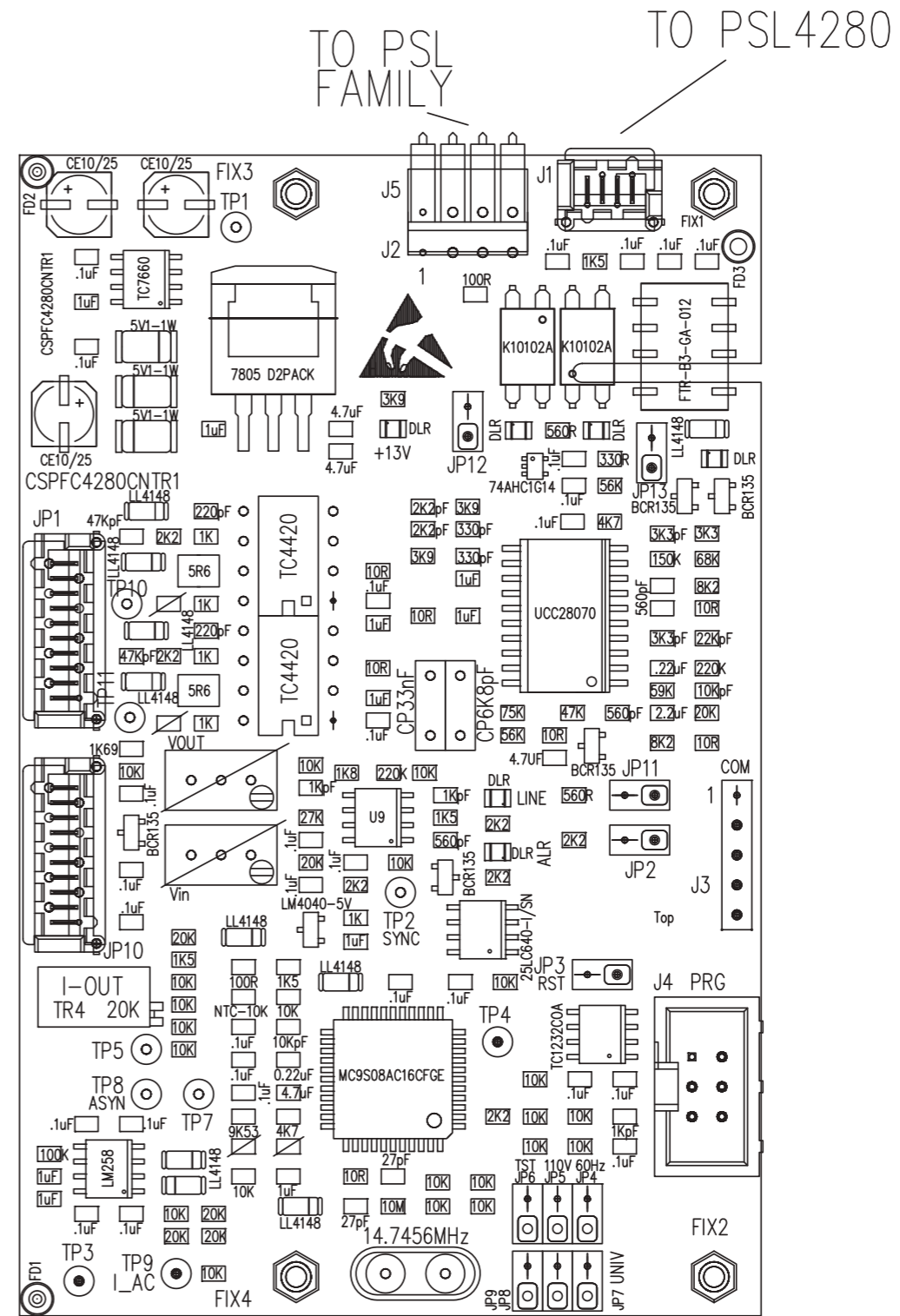


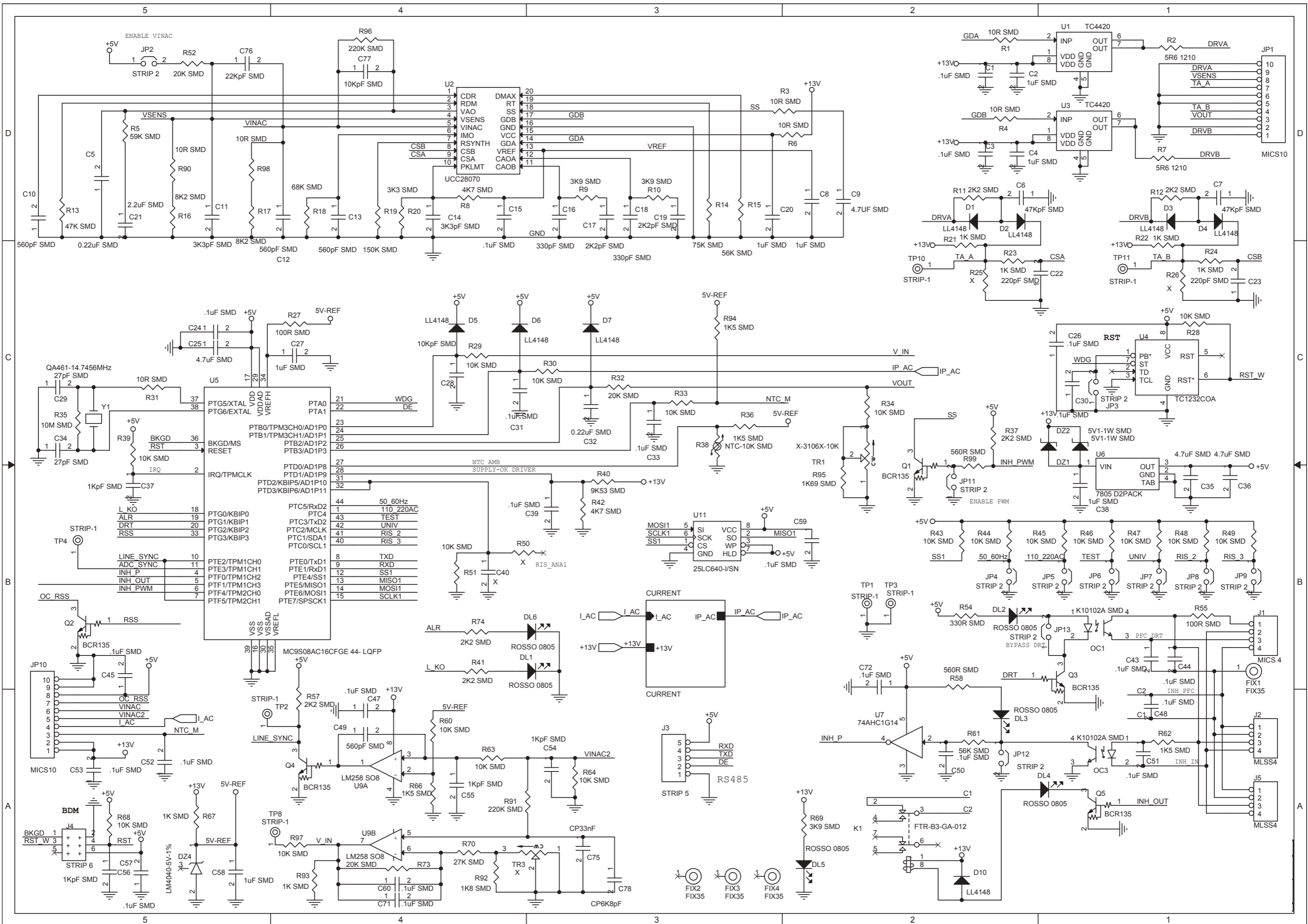
POWER PFC 4280 Revised: Wednesday, April 30, 2014  
PFC4280R1.DSN Revision: 1

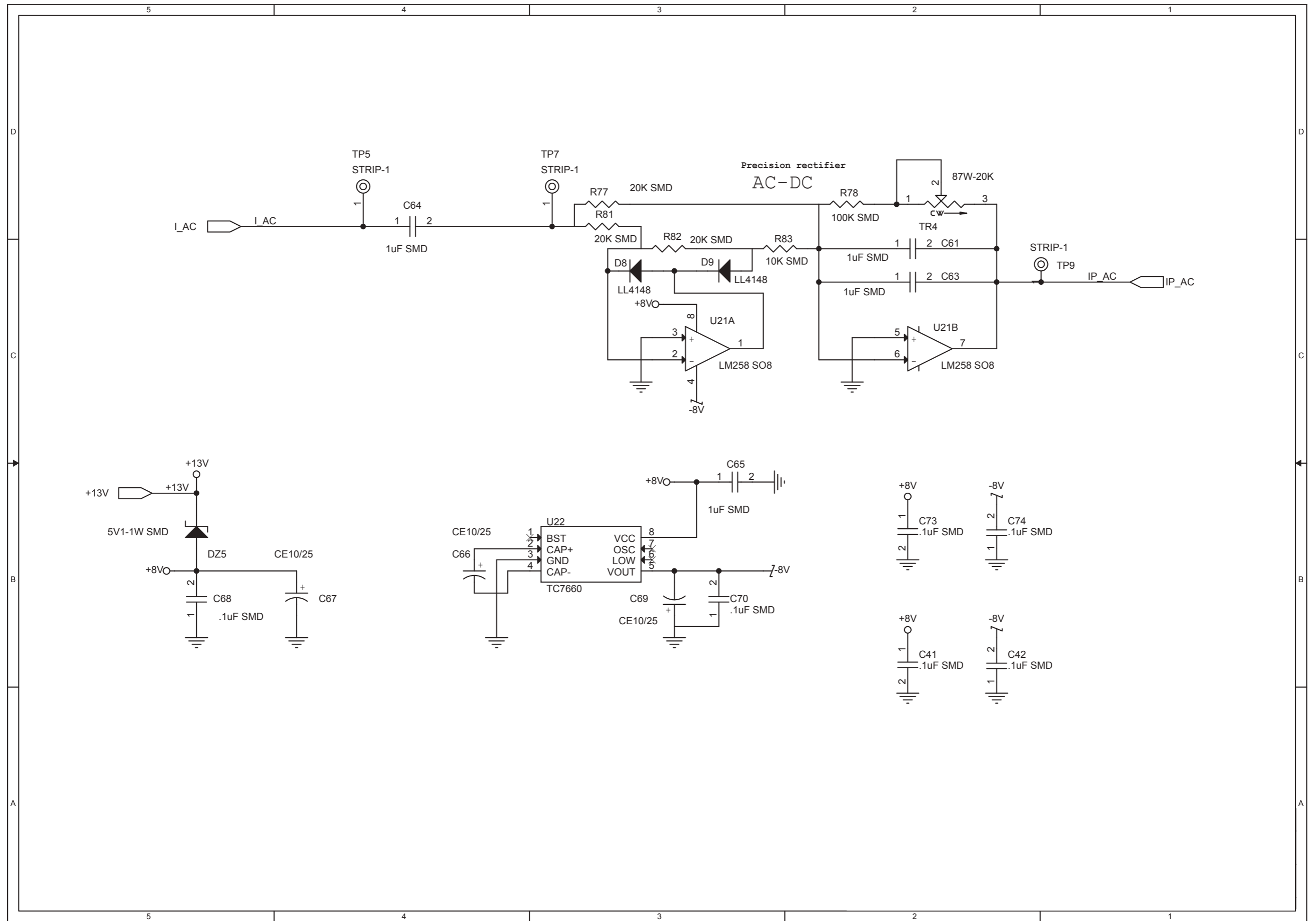
Item	Qty	Reference	Part
1	2	CS1,CS2	PE-51718
2	2	C1,C4	100pF-1KV
3	4	C2,C3,C14,C15	CD4K7pF-Y2
4	2	C5,C6	1uF-X2
5	1	C7	MKP2.2uF/400
6	4	C8,C12,C13,C16	10nF-1KV
7	3	C9,C10,C11	470uF-400
8	1	D1	20ETS08
9	2	D2,D3	CSD20060D
10	1	D4	GBPC3508W HIGH POWER
11	10	FIX1, FIX2, FIX3, FIX4, FIX5, FIX6, FIX7, FIX8, FIX9, FIX10	FIX35
12	2	FST1, FST2	FAST-ON
13	1	JP1	KRA4
14	1	J1	PAD2
15	1	J2	CON1
16	2	L1, L2	130uH
17	1	MD1	MODULO MOS
18	1	MD2	MODULO IN
19	2	Q1, Q2	SPW47N60C3
20	2	RV1, RV2	S14K275
21	1	RV3	VARISTOR-385Vac
22	1	R3	470K-2W
23	2	R4, R5	33R-2W
24	1	TF1	2X1.8mMh



FLI MOS





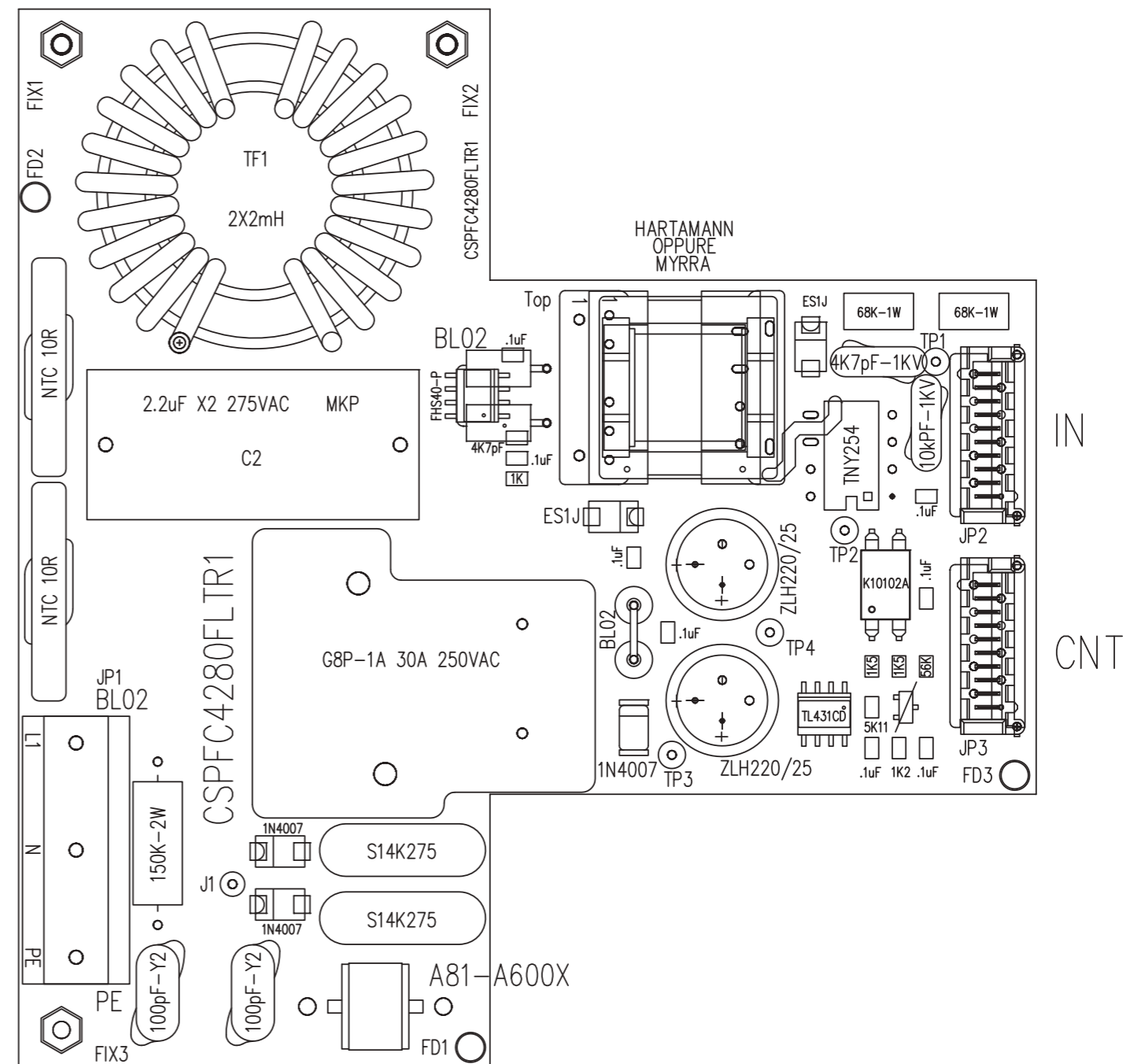
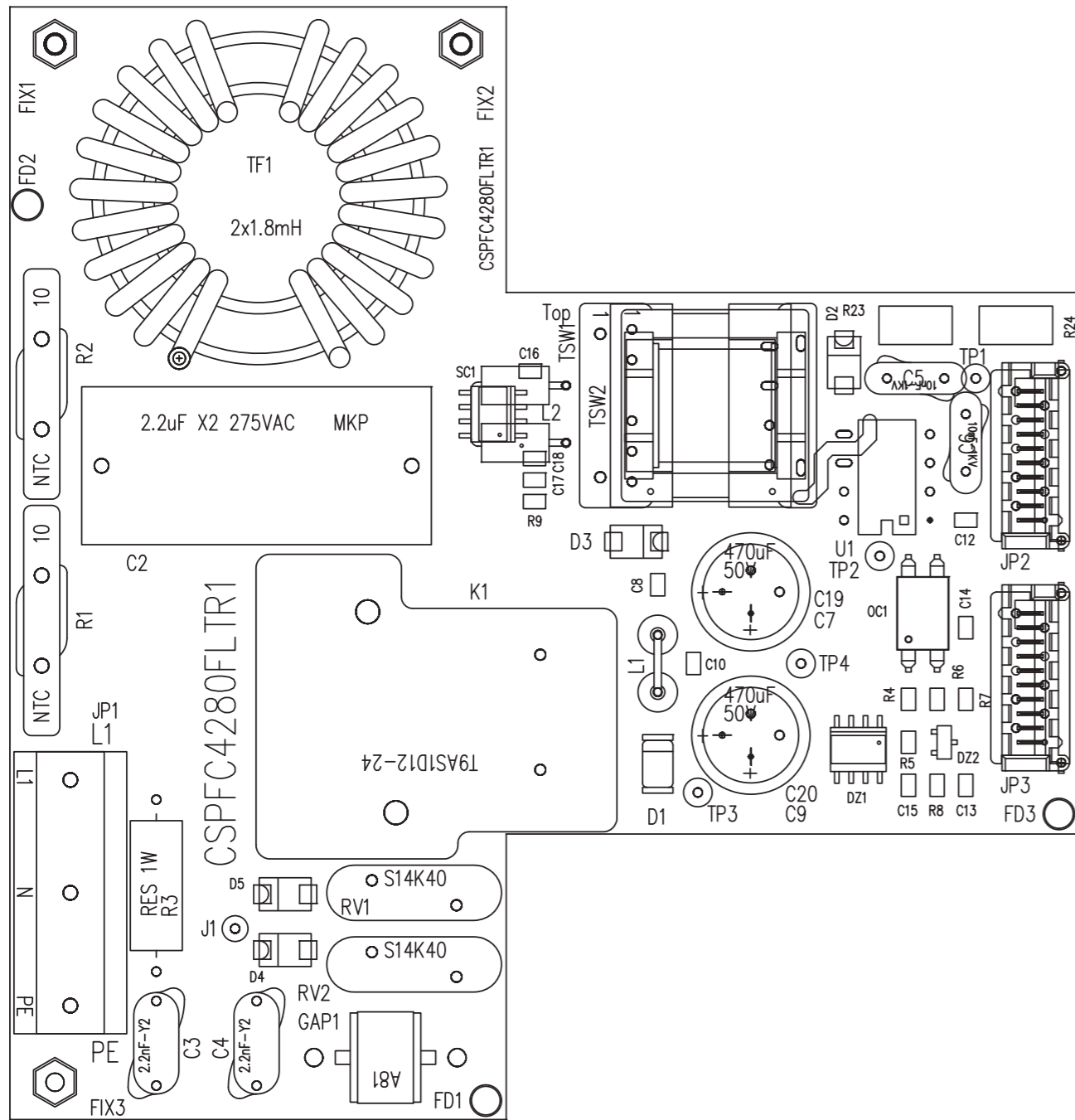


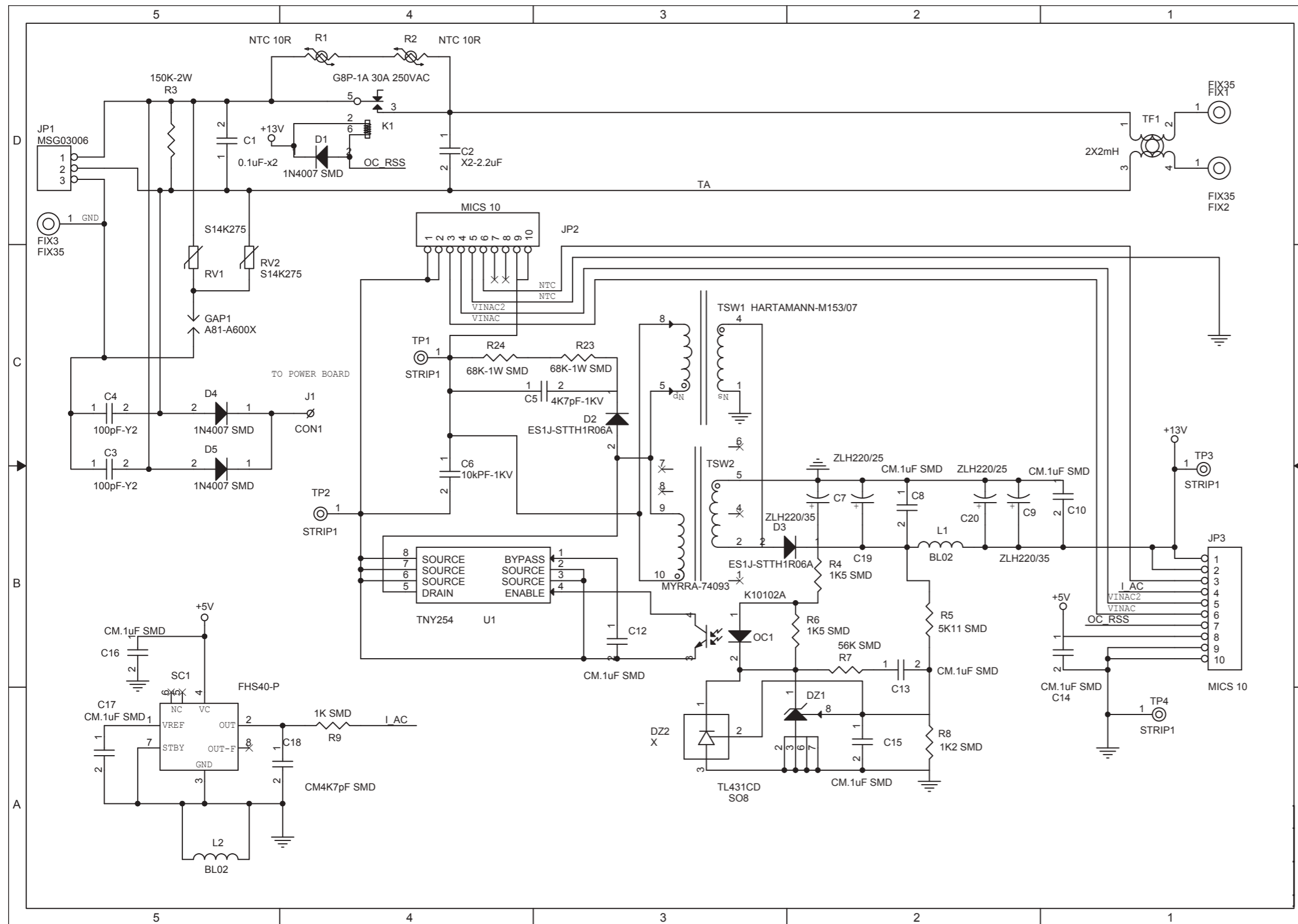


PFC CONTROLLER 4280 R1 Revised: Wednesday, April 30, 2014  
PFC4280CNT\_R0.DSN Revision: 1

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Item	Quantity	Reference	Part			
				42	2 R15,R61	56K SMD
				43	2 R16,R17	8K2 SMD
				44	1 R18	68K SMD
				45	1 R19	150K SMD
				46	1 R20	3K3 SMD
				47	6 R21,R22,R23,R24,R67,R93	1K SMD
				48	2 R27,R55	100R SMD
				49	20 R28,R29,R30,R33,R34,R39, R43,R44,R45,R46,R47,R48, R49,R51,R60,R63,R64,R68, R83,R97	10K SMD
				50	6 R32,R52,R73,R77,R81,R82	20K SMD
				51	1 R35	10M SMD
				52	4 R36,R62,R66,R94	1K5 SMD
				53	1 R38	NTC-10K SMD
				54	1 R40	9K53 SMD
				55	1 R54	330R SMD
				56	2 R58,R99	560R SMD
				57	1 R70	27K SMD
				58	1 R78	100K SMD
				59	2 R91,R96	220K SMD
				60	1 R92	1K8 SMD
				61	1 R95	1K69 SMD
				62	10 TP1,TP2,TP3,TP4,TP5,TP7, TP8,TP9,TP10,TP11	STRIP-1
				63	1 TR1	X-3106X-10K
				64	1 TR4	87W-20K
				65	2 U1,U3	TC4420
				66	1 U2	UCC28070
				67	1 U4	TC1232COA
				68	1 U5	MC9S08AC16CFGE 44- LQFP
				69	1 U6	7805 D2PACK
				70	1 U7	74AHC1G14
				71	2 U9,U21	LM258 SO8
				72	1 U11	25LC640-I/SN
				73	1 U22	TC7660
				74	1 Y1	QA461-14.7456MHz
	1	29 C1,C3,C15,C24,C26,C30, C31,C33,C39,C41,C42,C43, C44,C45,C47,C48,C50,C51, C52,C53,C57,C59,C60,C68, C70,C71,C72,C73,C74	.1uF SMD			
	2	11 C2,C4,C8,C20,C27,C38,C58, C61,C63,C64,C65	1uF SMD			
	3	2 C5,C32	0.22uF SMD			
	4	2 C6,C7	47KpF SMD			
	5	4 C9,C25,C35,C36	4.7uF SMD			
	6	4 C10,C12,C13,C49	560pF SMD			
	7	2 C11,C14	3K3pF SMD			
	8	2 C16,C18	330pF SMD			
	9	2 C17,C19	2K2pF SMD			
	10	1 C21	2.2uF SMD			
	11	2 C22,C23	220pF SMD			
	12	2 C28,C77	10KpF SMD			
	13	2 C29,C34	27pF SMD			
	14	4 C37,C54,C55,C56	1KpF SMD			
	15	5 TR3,R25,R26,C40,R50	X			
	16	3 C66,C67,C69	CE10/25			
	17	1 C75	CP33nF			
	18	1 C76	22KpF SMD			
	19	1 C78	CP6K8pF			
	20	6 DL1,DL2,DL3,DL4,DL5,DL6	ROSSO 0805			
	21	3 DZ1,DZ2,DZ5	5V1-1W SMD			
	22	1 DZ4	LM4040-5V-1%			
	23	10 D1,D2,D3,D4,D5,D6,D7,D8, D9,D10	LL4148			
	24	4 FIX1,FIX2,FIX3,FIX4	FIX35			
	25	2 JP1,JP10	MICS10			
	26	11 JP2,JP3,JP4,JP5,JP6,JP7, JP8,JP9,JP11,JP12,JP13	STRIP 2			
	27	1 J1	MICS 4			
	28	2 J2,J5	MLSS4			
	29	1 J3	STRIP 5			
	30	1 J4	STRIP 6			
	31	1 K1	FTR-B3-GA-012			
	32	2 OC1,OC3	K10102A SMD			
	33	5 Q1,Q2,Q3,Q4,Q5	BCR135			
	34	7 R1,R3,R4,R6,R31,R90,R98	10R SMD			
	35	2 R2,R7	5R6 1210			
	36	1 R5	59K SMD			
	37	2 R8,R42	4K7 SMD			
	38	3 R9,R10,R69	3K9 SMD			
	39	6 R11,R12,R37,R41,R57,R74	2K2 SMD			
	40	1 R13	47K SMD			
	41	1 R14	75K SMD			





SOFT SART FILTRO EMI E SUPPLY +15VDC

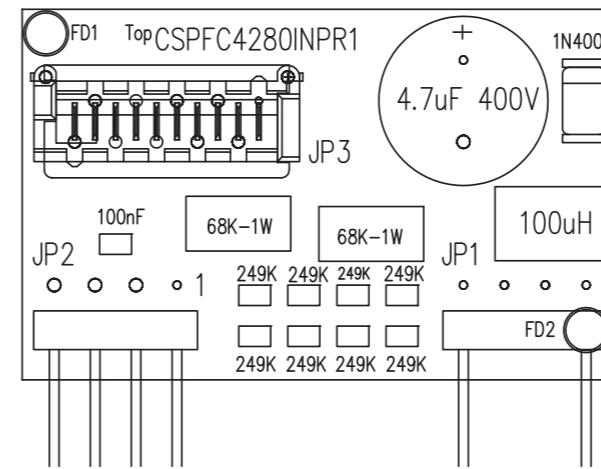
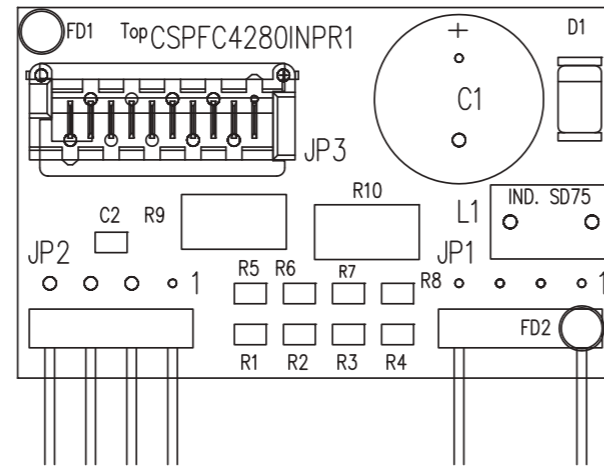
Revised: Wednesday, April 30, 2014

PFC4280\_FLT\_R1.DSN

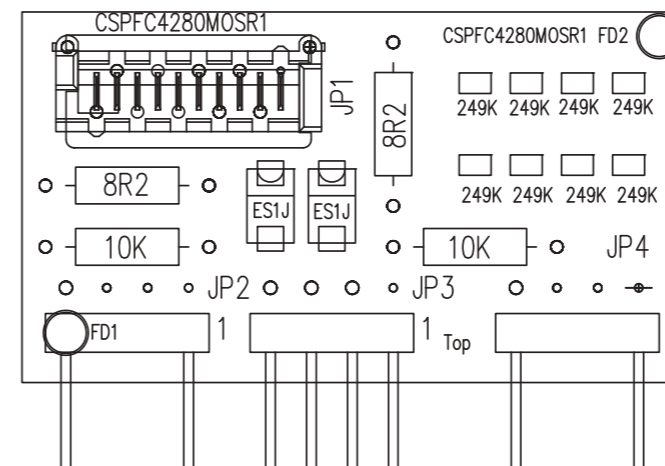
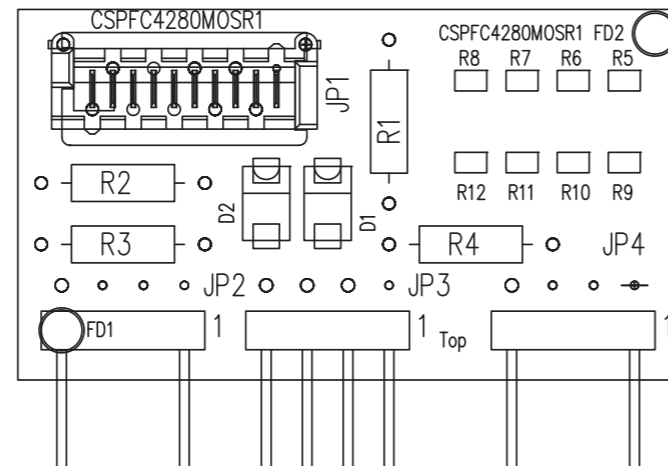
Revision: 1

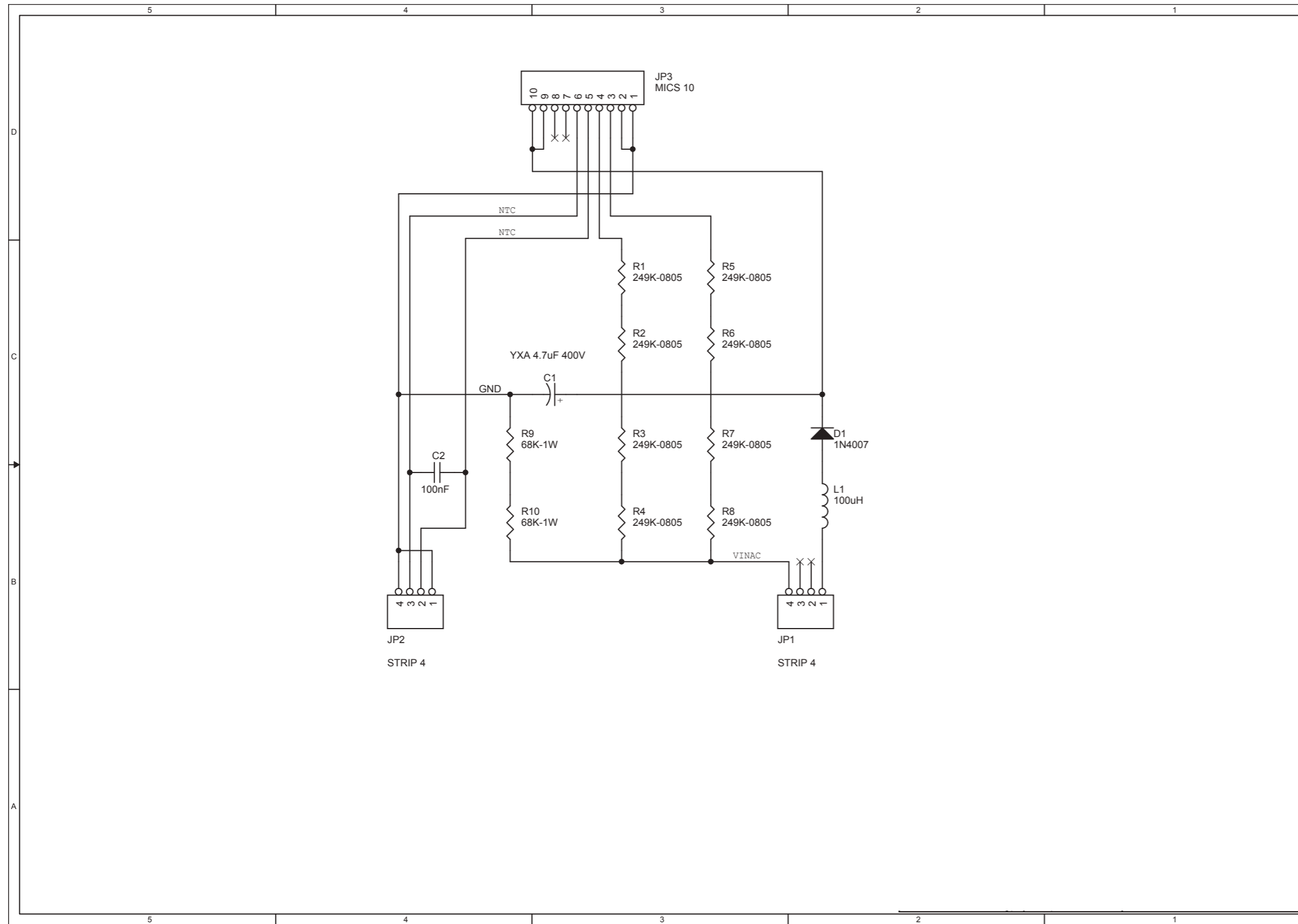
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1	1	C1	0.1uF-x2
2	1	C2	X2-2.2uF
3	2	C3,C4	100pF-Y2
4	1	C5	4K7pF-1KV
5	1	C6	10kPF-1KV
6	2	C7,C9	ZLH220/35
7	8	C8,C10,C12,C13,C14,C15,C16,C17	CM.1uF SMD
8	1	C18	CM4K7pF SMD
9	2	C19,C20	ZLH220/25
10	1	DZ1	TL431CD
11	1	DZ2	X
12	3	D1,D4,D5	1N4007 SMD
13	2	D2,D3	ES1J-STTH1R06A
14	3	FIX1, FIX2, FIX3	FIX35
15	1	GAP1	A81-A600X
16	1	JP1	MSG03006
17	2	JP2, JP3	MICS 10
18	1	J1	CON1
19	1	K1	G8P-1A 30A 250VAC
20	2	L1, L2	BL02
21	1	OC1	K10102A
22	2	RV1, RV2	S14K275
23	2	R1, R2	NTC 10R
24	1	R3	150K-2W
25	2	R4, R6	1K5 SMD
26	1	R5	5K11 SMD
27	1	R7	56K SMD
28	1	R8	1K2 SMD
29	1	R9	1K SMD
30	2	R23, R24	68K-1W SMD
31	1	SC1	FHS40-P
32	1	TF1	2X2mH
33	4	TP1, TP2, TP3, TP4	STRIP1
34	1	TSW1	HARTAMANN-M153/07
35	1	TSW2	MYRRA-74093
36	1	U1	TNY254

# INPUT PFC4280R1



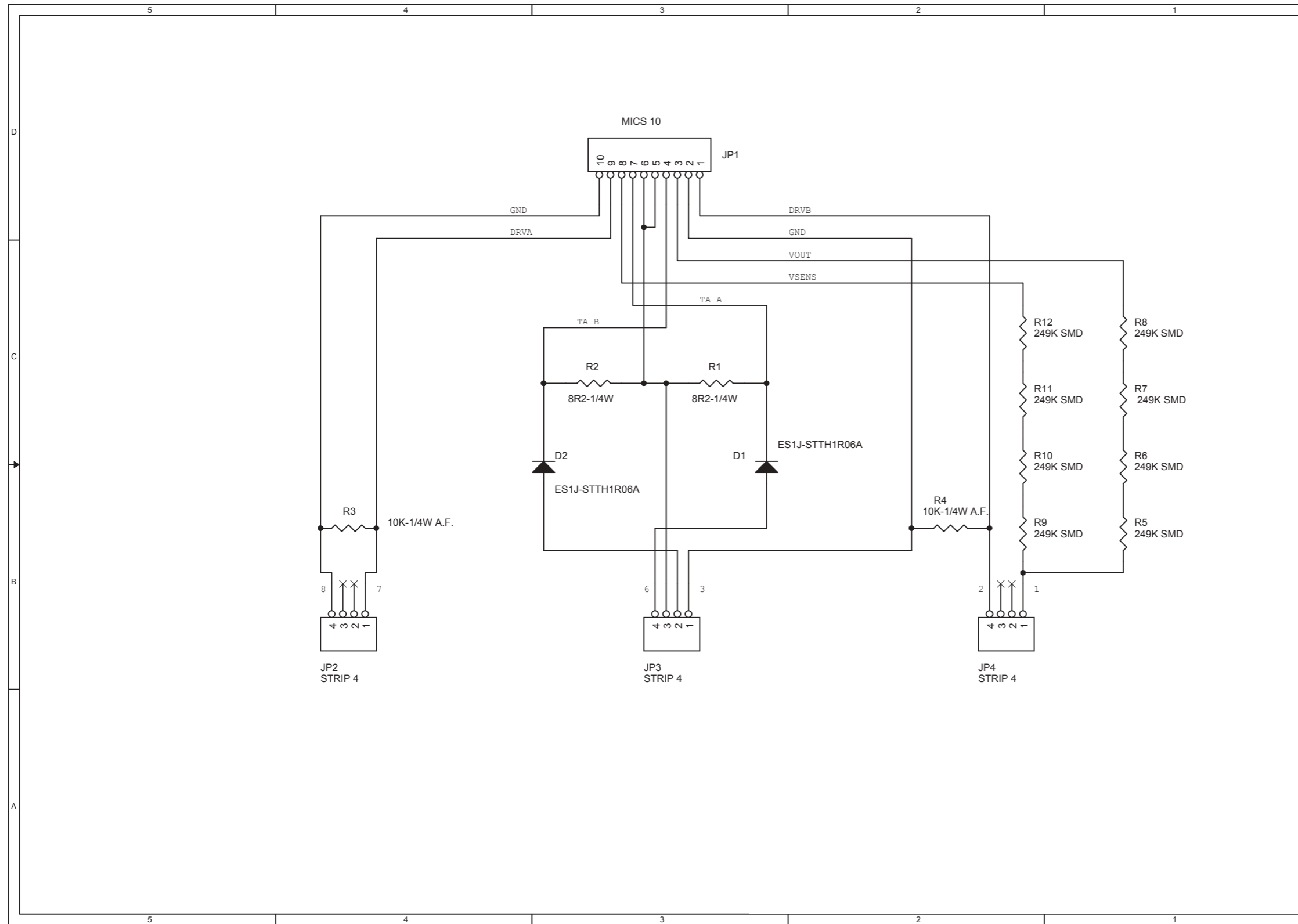
# MOS PFC4280R1





MODULO PFC 4280 INPUT  
Revised: Wednesday, April 30, 2014  
Revision: 0

Item	Qty	Reference	Part
1	1	C1	YXA 4.7uF 400V
2	1	C2	100nF
3	1	D1	1N4007
4	2	JP1,JP2	STRIP 4
5	1	JP3	MICS 10
6	1	L1	100uH
7	8	R1,R2,R3,R4, R5,R6,R7,R8	249K-0805
8	2	R9,R10	68K-1W

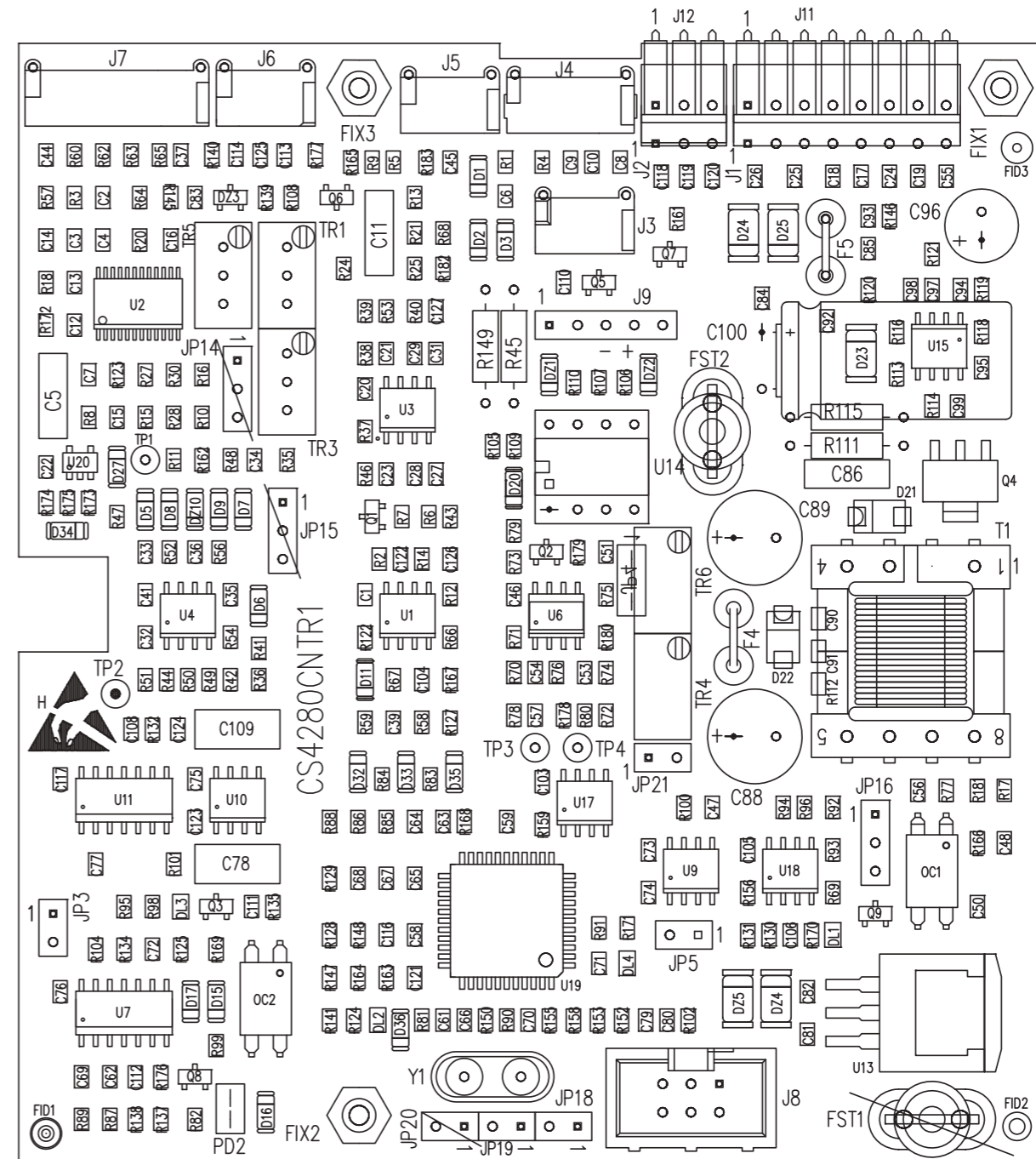
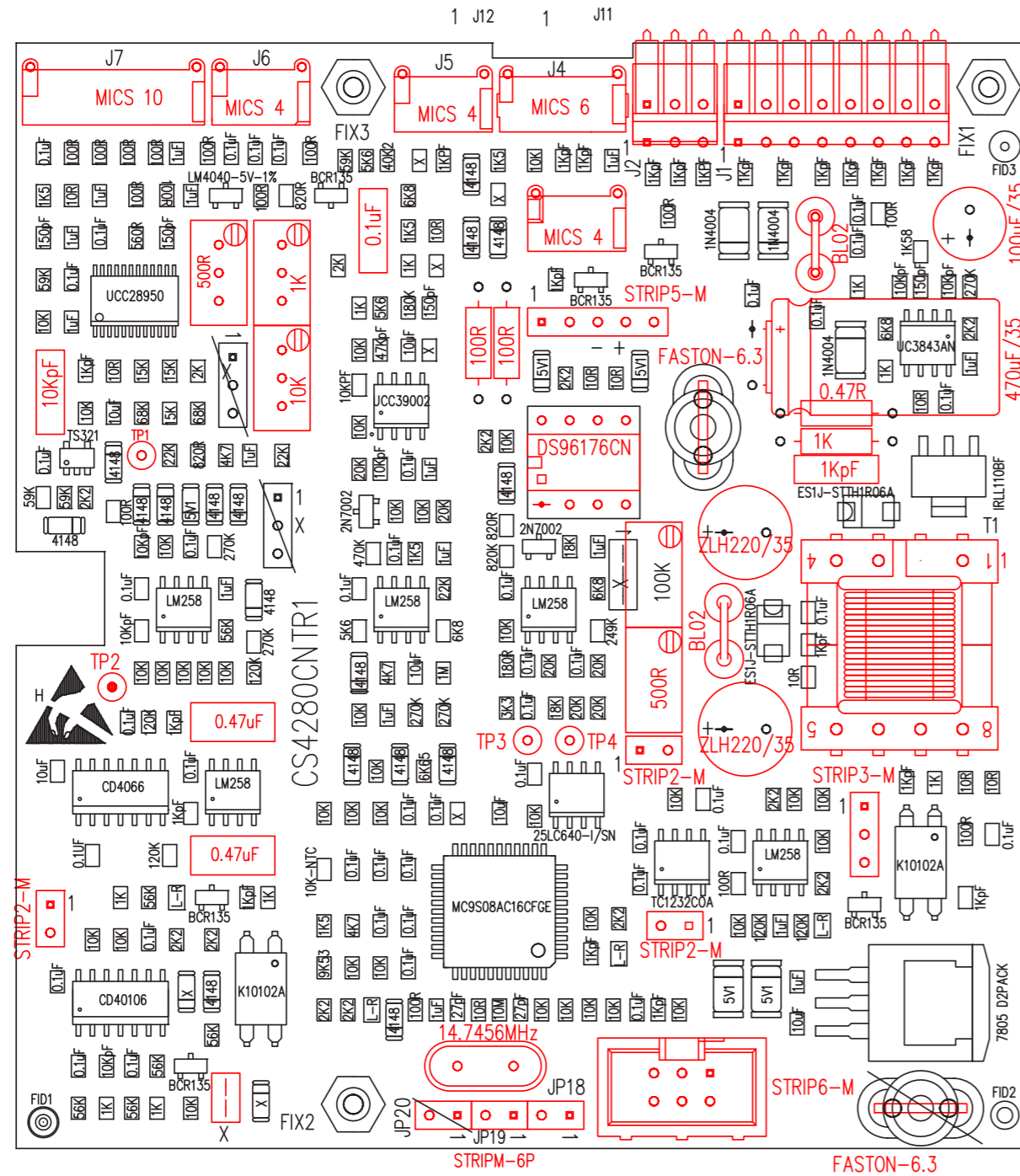


MODULO PFC 4280 INPUT  
Revised: Wednesday, April 30, 2014  
Revision: 0

Item	Qty	Reference	Part
1	2	D1,D2	ES1J-STTH1R06A
2	1	JP1	MICS 10
3	3	JP2,JP3,JP4	STRIP 4
4	2	R1,R2	8R2-1/4W
5	2	R3,R4	10K-1/4W A.F.
6	7	R5,R6,R8,R9, R10,R11,R12	249K SMD
7	1	R7	249K SMD

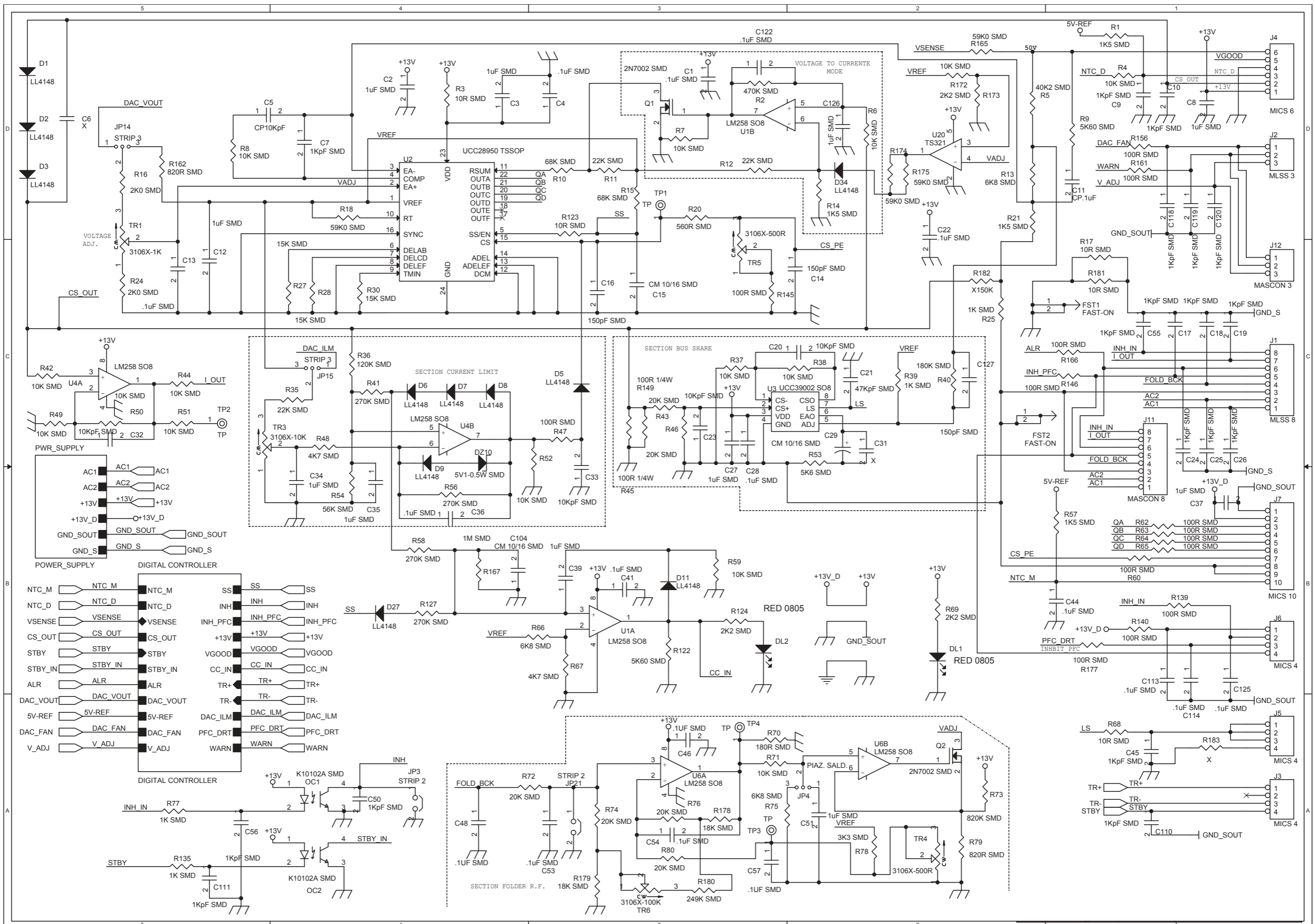


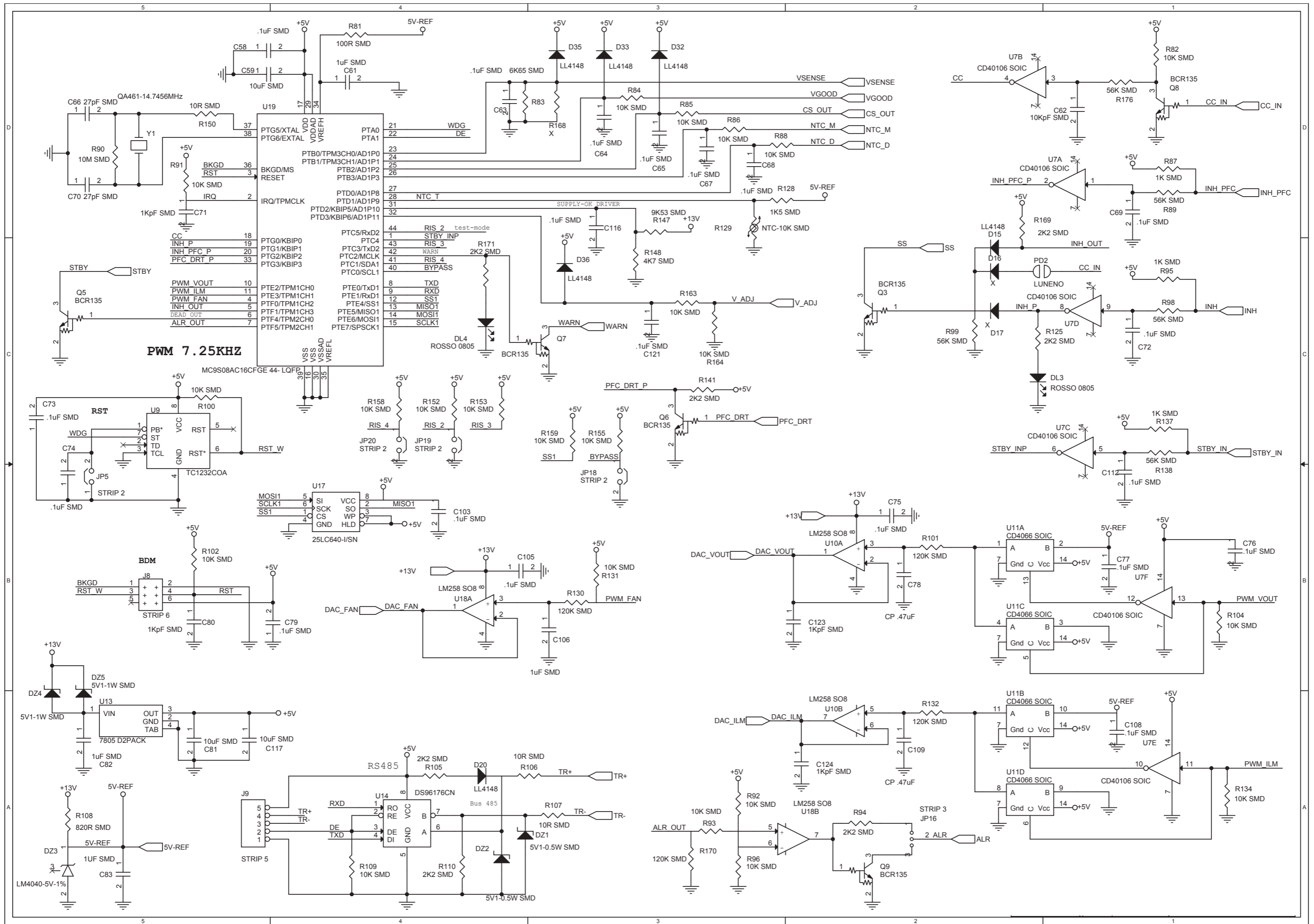
**Power supply (KPSL4280HS.LC)**

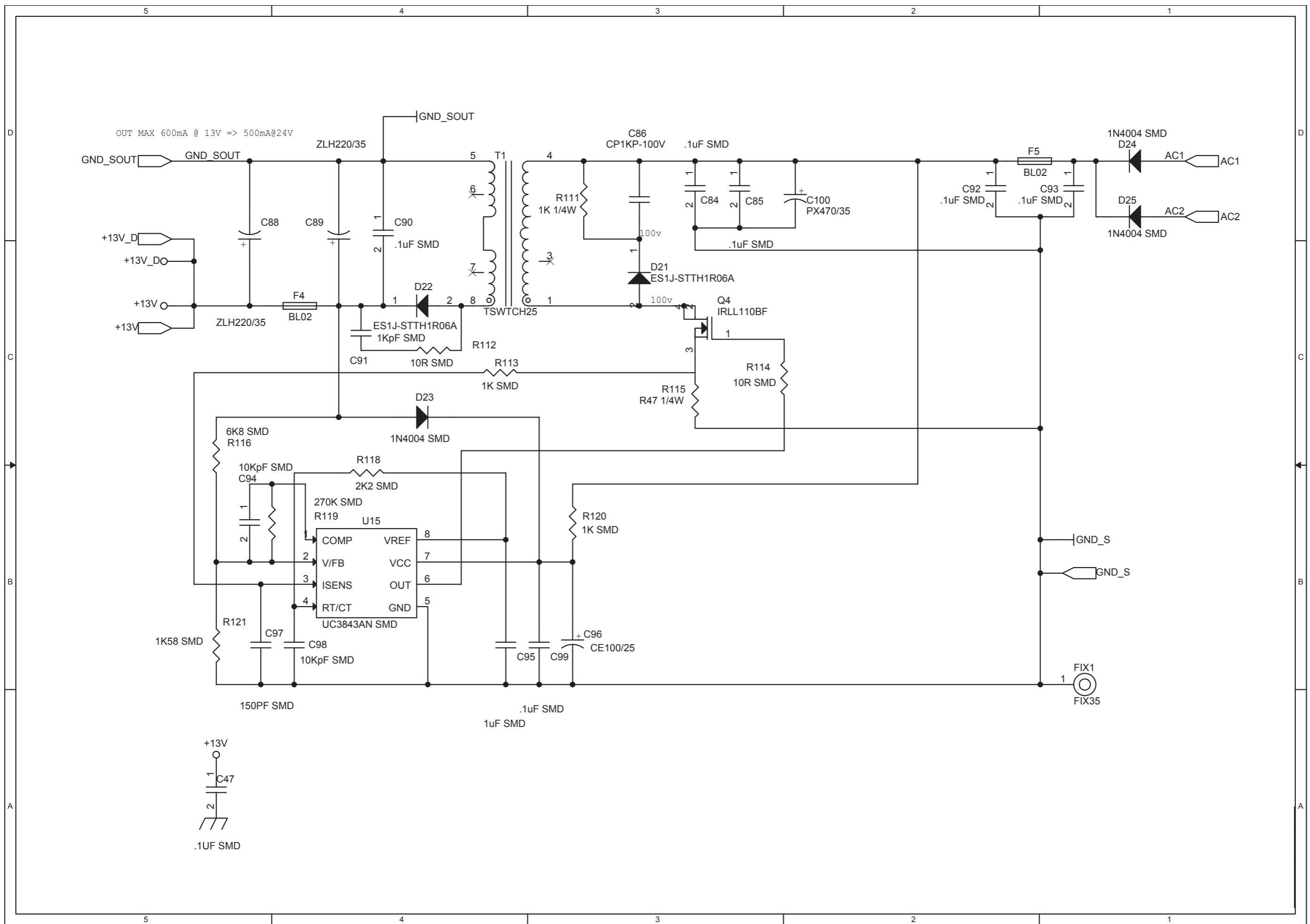






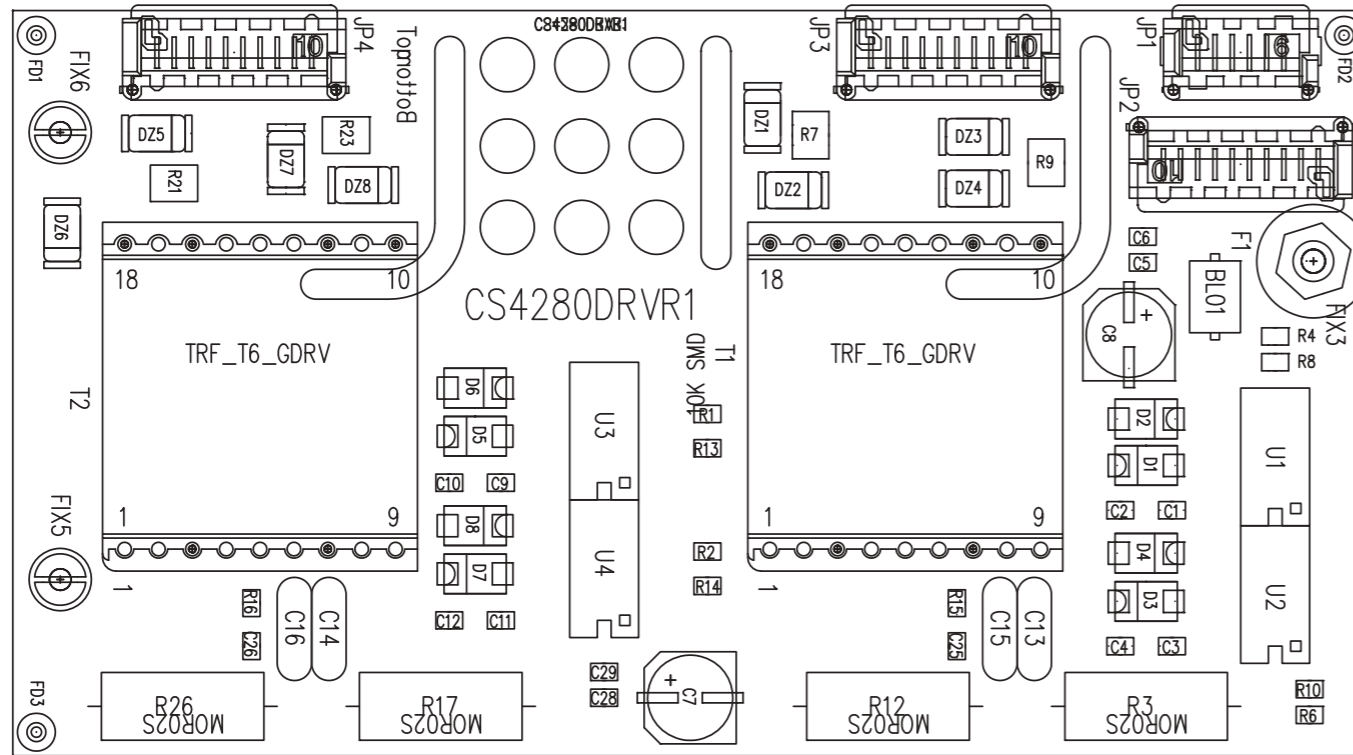






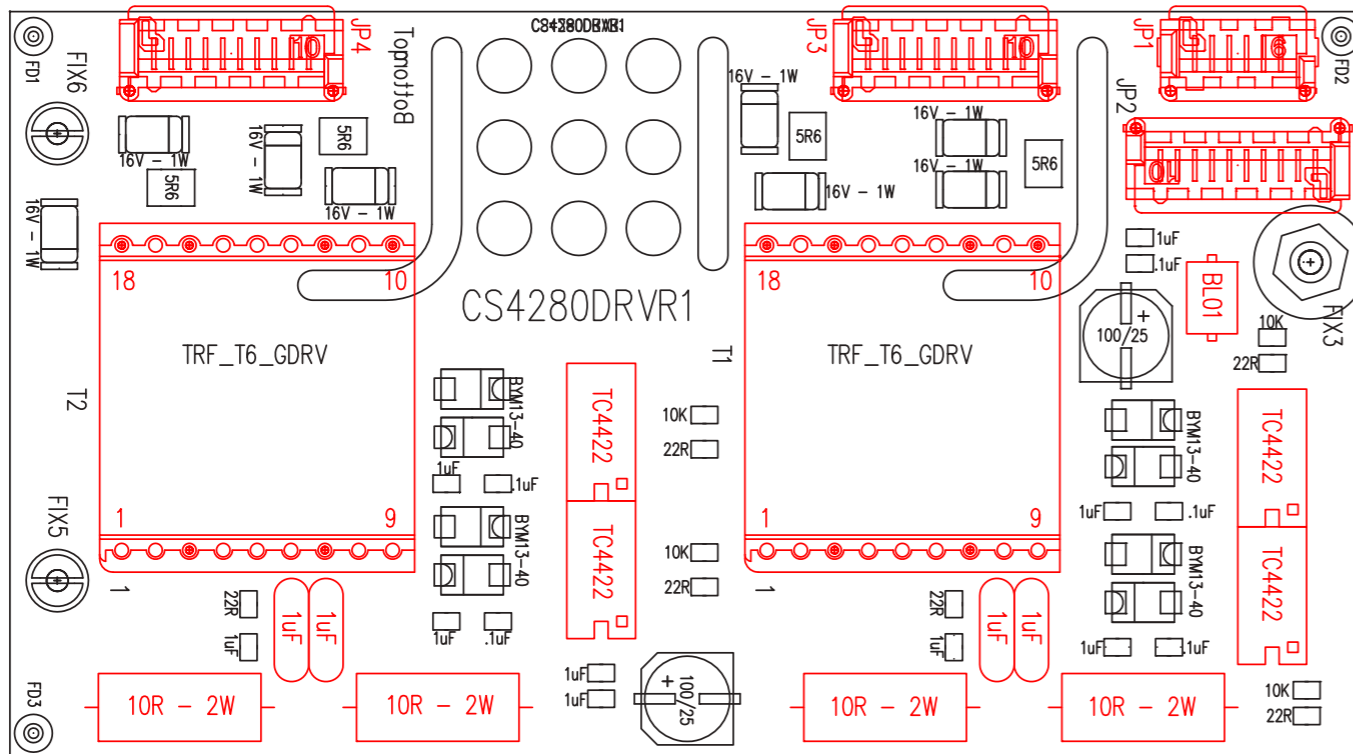
PSL4280 PWM CONTROLLER Revised: Thursday, June 27, 2013  
 PSL4280CNT Revision: 1

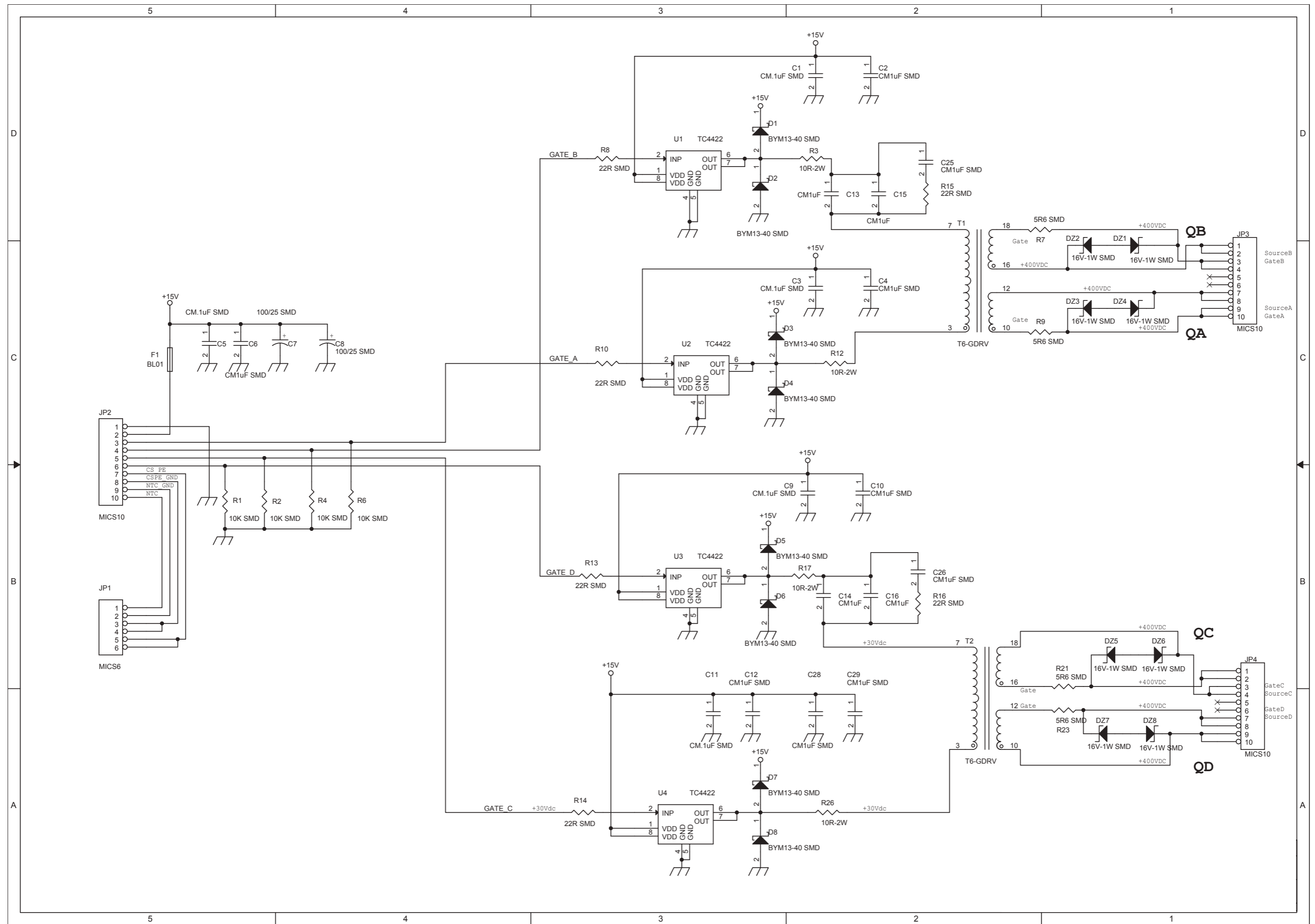
Item	Quantity	Reference	Part						
1	44	C1,C4,C13,C22,C28,C36, C41,C44,C46,C47,C48,C53, C54,C57,C58,C63,C64,C65, C67,C68,C69,C72,C73,C74, C75,C76,C77,C79,C84,C85, C90,C92,C93,C99,C103, C105,C108,C112,C113,C114, C116,C121,C122,C125	.1uF SMD	34	3 J3,J5,J6	MICS 4	77	1 R115	R47 1/4W
2	16	C2,C3,C8,C12,C27,C34,C35, C37,C39,C51,C61,C82,C83, C95,C106,C126	1uF SMD	35	1 J4	MICS 6	78	1 R121	1K58 SMD
3	1	C5	CP10KpF	36	1 J7	MICS 10	79	1 R129	NTC-10K SMD
4	6	C6,D16,D17,C31,R168,R183	X	37	1 J8	STRIP 6	80	1 R147	9K53 SMD
5	23	C7,C9,C10,C17,C18,C19, C24,C25,C26,C45,C50,C55, C56,C71,C80,C91,C110, C111,C118,C119,C120,C123, C124	1KpF SMD	38	1 J9	STRIP 5	81	1 R167	1M SMD
6	1	C11	CP.1uF	39	1 J11	MASCON 8	82	2 R178,R179	18K SMD
7	4	C14,C16,C97,C127	150pF SMD	40	1 J12	MASCON 3	83	1 R180	249K SMD
8	3	C15,C29,C104	CM 10/16 SMD	41	2 OC1,OC2	K10102A SMD	84	1 R182	X150K
9	7	C20,C23,C32,C33,C62,C94, C98	10KpF SMD	42	1 PD2	LUNENO	85	4 TP1,TP2,TP3,TP4	TP
10	1	C21	47KpF SMD	43	2 Q1,Q2	2N7002 SMD	86	1 TR1	3106X-1K
11	3	C59,C81,C117	10uF SMD	44	6 Q3,Q5,Q6,Q7,Q8,Q9	BCR135	87	1 TR3	3106X-10K
12	2	C66,C70	27pF SMD	45	1 Q4	IRLL110BF	88	2 TR4,TR5	3106X-500R
13	1	C78	CP .47uF	46	5 R1,R14,R21,R57,R128	1K5 SMD	89	1 TR6	3106X-100K
14	1	C86	CP1KP-100V	47	1 R2	470K SMD	90	1 T1	TSWTCH25
15	2	C88,C89	ZLH220/35	48	10 R3,R17,R68,R106,R107, R112,R114,R123,R150,R181	10R SMD	91	5 U1,U4,U6,U10,U18	LM258 SO8
16	1	C96	CE100/25	49	37 R4,R6,R7,R8,R37,R38,R42, R44,R49,R50,R51,R52,R59, R71,R82,R84,R85,R86,R88, R91,R92,R93,R96,R100, R102,R104,R109,R131,R134, R152,R153,R155,R158,R159, R163,R164,R172	10K SMD	92	1 U2	UCC28950 TSSOP
17	1	C100	PX470/35	50	1 R5	40K2 SMD	93	1 U3	UCC39002 SO8
18	1	C109	CP .47uF	51	2 R9,R122	5K60 SMD	94	1 U7	CD40106 SOIC
19	4	DL1,DL2,DL3,DL4	ROSSO 0805	52	2 R10,R15	68K SMD	95	1 U9	TC1232COA
20	3	DZ1,DZ2,DZ10	5V1-0.5W SMD	53	3 R11,R12,R35	22K SMD	96	1 U11	CD4066 SOIC
21	1	DZ3	LM4040-5V-1%	54	4 R13,R66,R75,R116	6K8 SMD	97	1 U13	7805 D2PACK
22	2	DZ4,DZ5	5V1-1W SMD	55	2 R16,R24	2K0 SMD	98	1 U14	DS96176CN
23	17	D1,D2,D3,D5,D6,D7,D8,D9, D11,D15,D20,D27,D32,D33, D34,D35,D36	LL4148	56	4 R18,R165,R174,R175	59K0 SMD	99	1 U15	UC3843AN SMD
24	2	D21,D22	ES1J-STTH1R06A	57	1 R20	560R SMD	100	1 U17	25LC640-I/SN
25	3	D23,D24,D25	1N4004 SMD	58	9 R25,R39,R77,R87,R95,R113, R120,R135,R137	1K SMD	101	1 U19	MC9S08AC16CFGE 44- LQFP
26	1	FIX1	FIX35	59	3 R27,R28,R30	15K SMD	102	1 U20	TS321
27	2	FST1,FST2	FAST-ON	60	5 R36,R101,R130,R132,R170	120K SMD	103	1 Y1	QA461-14.7456MHz
28	2	F4,F5	BL02	61	1 R40	180K SMD			
29	6	JP3,JP5,JP18,JP19,JP20, JP21	STRIP 2	62	5 R41,R56,R58,R119,R127	270K SMD			
30	1	JP4	PIAZ. SALD.	63	6 R43,R46,R72,R74,R76,R80	20K SMD			
31	3	JP14,JP15,JP16	STRIP 3	64	2 R45,R149	100R 1/4W			
32	1	J1	MLSS 8	65	15 R47,R60,R62,R63,R64,R65, R81,R139,R140,R145,R146, R156,R161,R166,R177	100R SMD			
33	1	J2	MLSS 3	66	3 R48,R67,R148	4K7 SMD			
				67	1 R53	5K6 SMD			
				68	6 R54,R89,R98,R99,R138, R176	56K SMD			
				69	11 R69,R94,R105,R110,R118, R124,R125,R141,R169,R171, R173	2K2 SMD			
				70	1 R70	180R SMD			
				71	1 R73	820K SMD			
				72	1 R78	3K3 SMD			
				73	3 R79,R108,R162	820R SMD			
				74	1 R83	6K65 SMD			
				75	1 R90	10M SMD			
				76	1 R111	1K 1/4W			

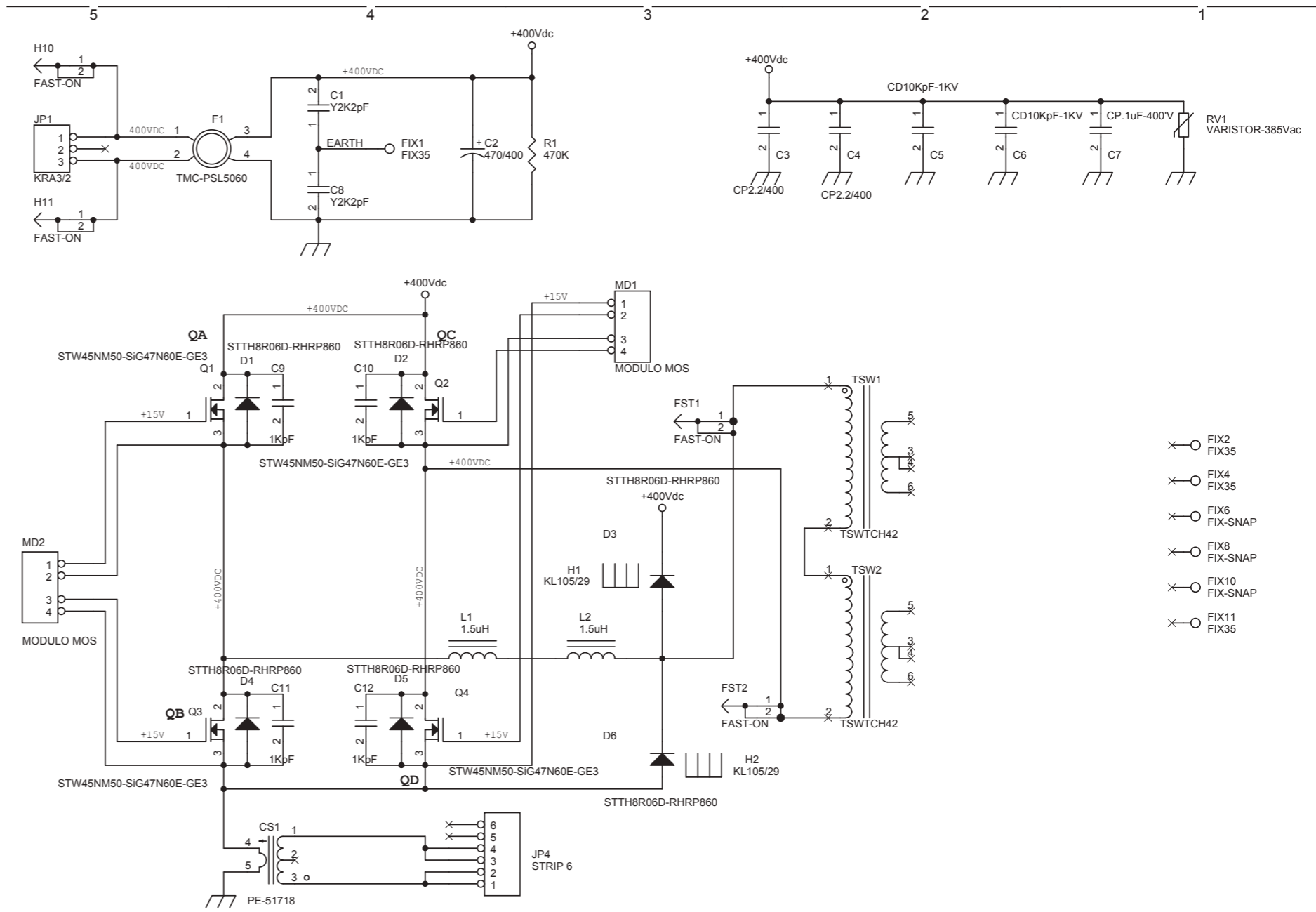
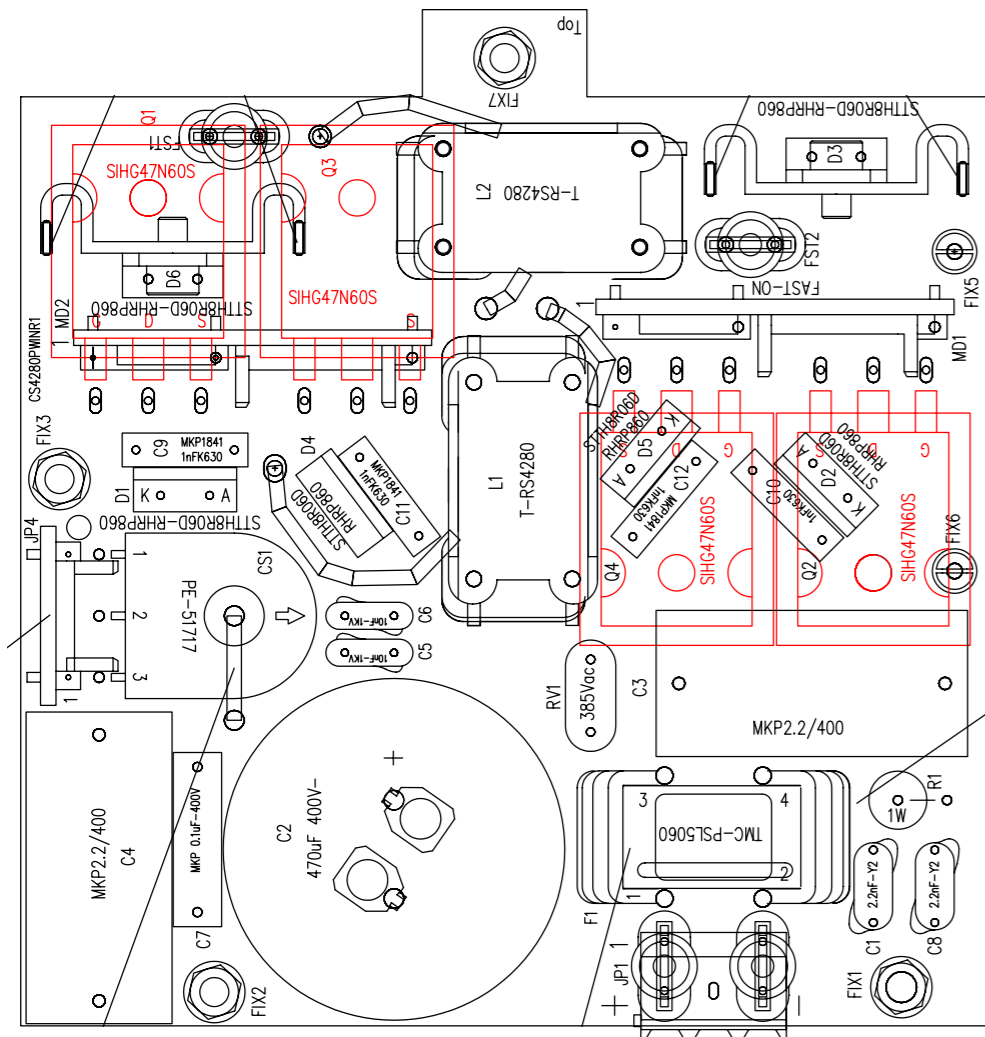


DRIVER PSL4280 Revised: Monday, July 01, 2013  
CS4280\_DRV.DSN Revision: 1

Item	Quantity	Reference	Part
1	5	C1,C3,C5,C9,C11	CM.1uF SMD
2	9	C2,C4,C6,C10,C12,C25,C26, C28,C29	CM1uF SMD
3	2	C7,C8	100/25 SMD
4	4	C13,C14,C15,C16	CM1uF
5	8	DZ1,DZ2,DZ3,DZ4,DZ5,DZ6, DZ7,DZ8	16V-1W SMD
6	8	D1,D2,D3,D4,D5,D6,D7,D8	BYM13-40 SMD
7	1	F1	BL01
8	1	JP1	MICS6
9	3	JP2,JP3,JP4	MICS10
10	4	R1,R2,R4,R6	10K SMD
11	4	R3,R12,R17,R26	10R-2W
12	4	R7,R9,R21,R23	5R6 SMD
13	6	R8,R10,R13,R14,R15,R16	22R SMD
14	2	T1,T2	T6-GDRV
15	4	U1,U2,U3,U4	TC4422





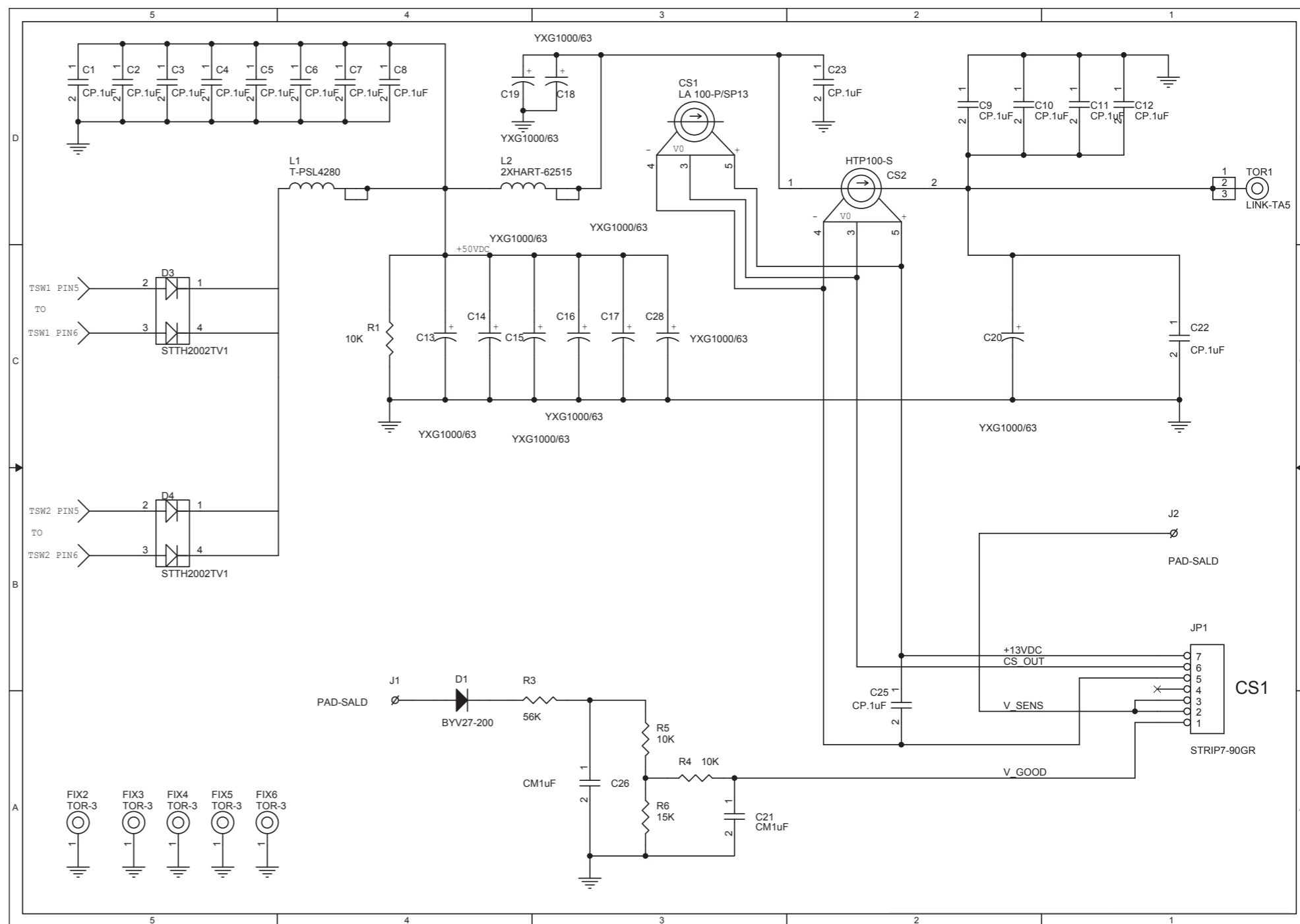
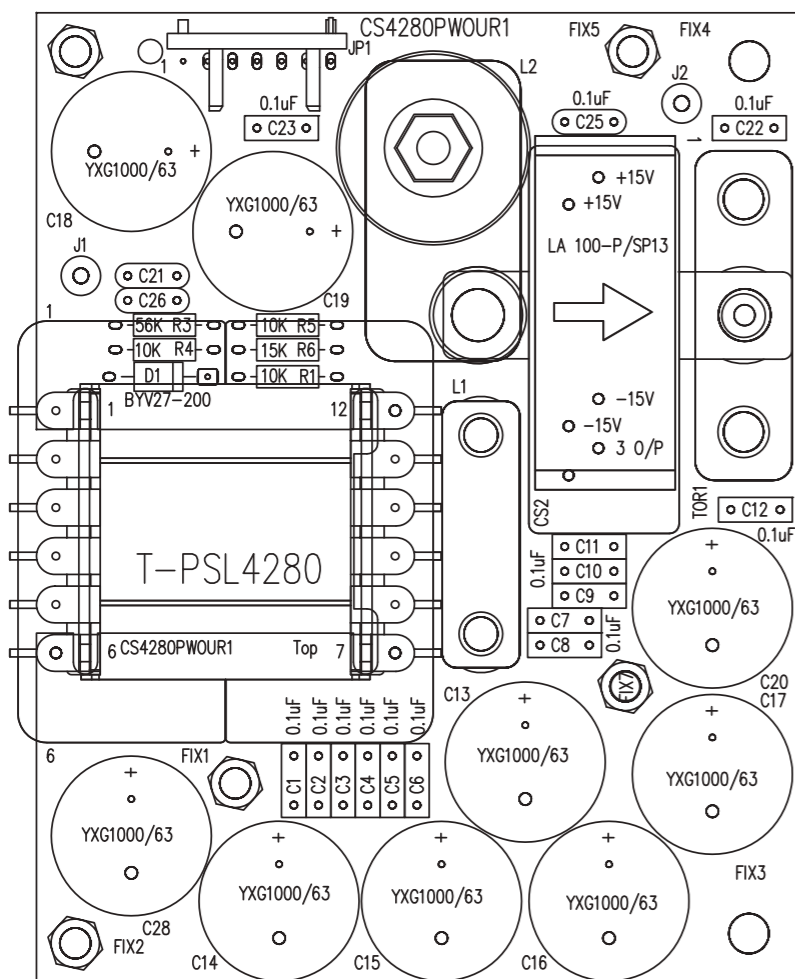


Revised: Monday, July 01, 2013

PSL4280\_PWRIN.DSN Revision: 1

Item	Quantity	Reference	Part
			11 4 FST1,FST2,H10,H11 FAST-ON
			12 1 F1 TMC-PSL5060
			13 2 H1,H2 KL105/29
			14 1 JP1 KRA3/2
			15 1 JP4 STRIP 6
			16 2 L1,L2 1.5uH
			17 2 MD1,MD2 MODULO MOS
			18 4 Q1,Q2,Q3,Q4 STW45NM50-SiG47N60E-GE3
			19 1 RV1 VARISTOR-385Vac
			20 1 R1 470K
			21 2 TSW1,TSW2 TSWTCH42
1	1	CS1	PE-51718
2	2	C1,C8	Y2K2pF
3	1	C2	470/400
4	2	C3,C4	CP2.2/400
5	2	C5,C6	CD10KpF-1KV
6	1	C7	CP.1uF-400V
7	4	C9,C10,C11,C12	1KpF
8	6	D1,D2,D3,D4,D5,D6	STTH8R06D-RHRP860
9	4	FIX1,FIX2,FIX4,FIX11	FIX35
10	3	FIX6,FIX8,FIX10	FIX-SNAP

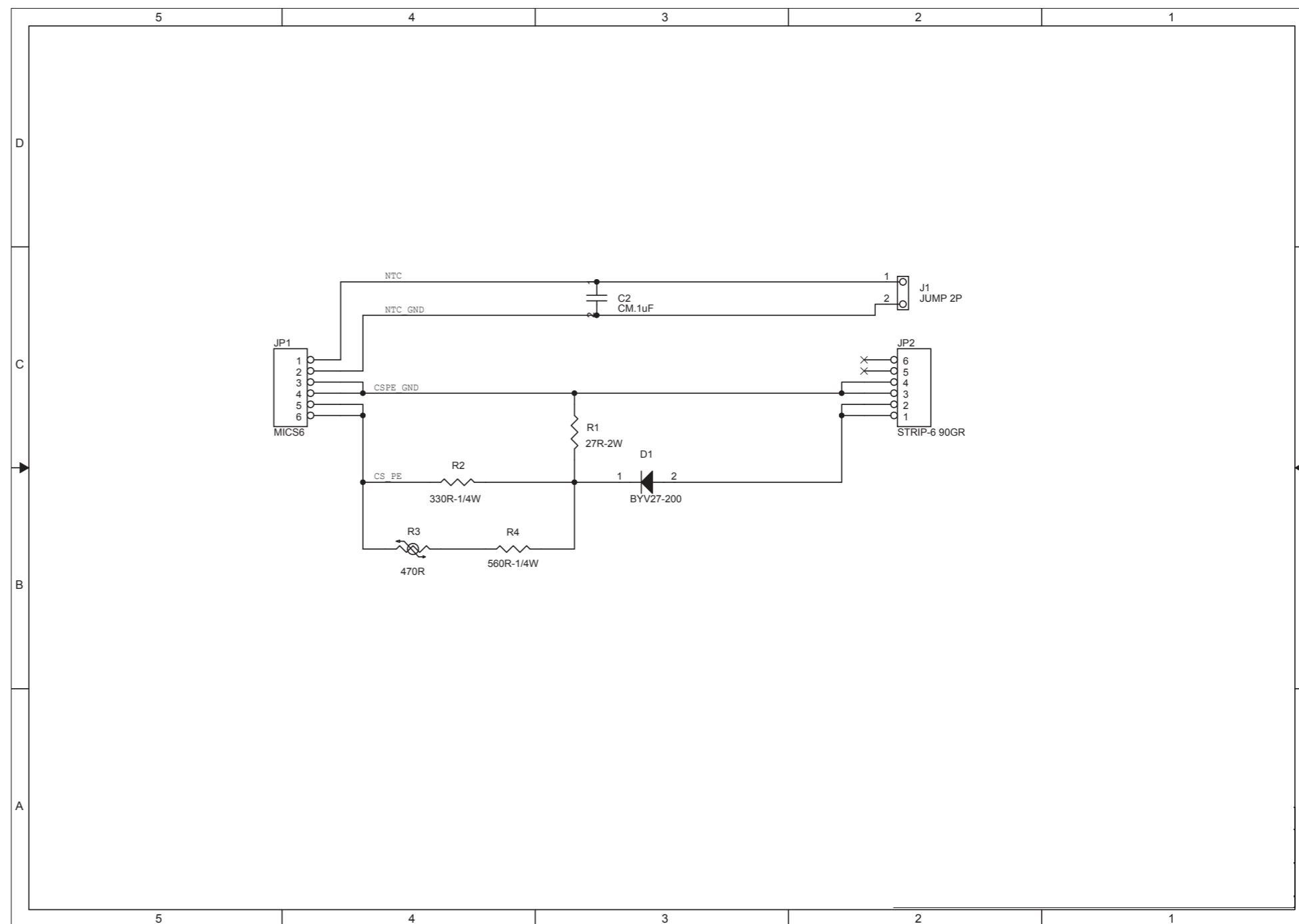
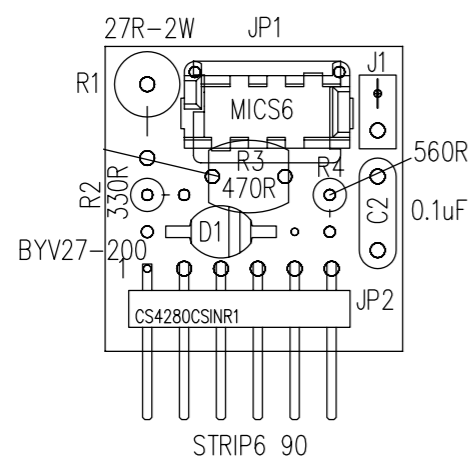




Revised: Monday, July 01, 2013

PSL4280\_PWRIN.DSN Revision: 1

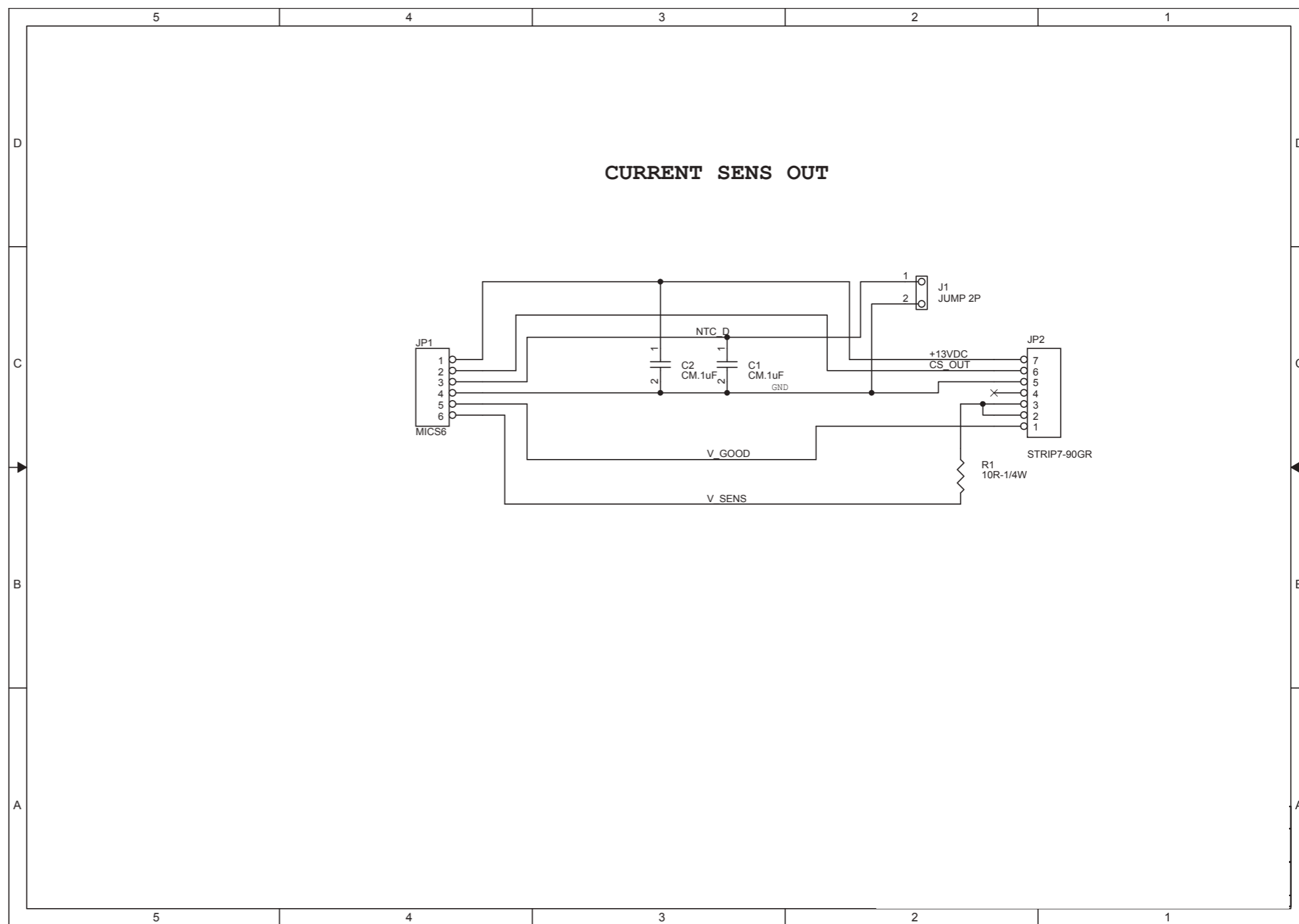
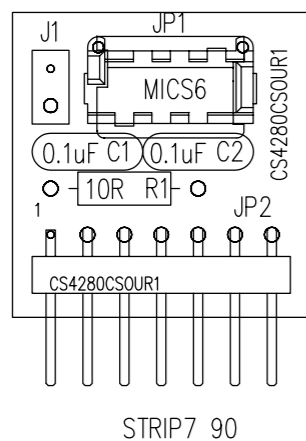
Item	Quantity	Reference	Part
1	1	CS1	PE-51718
2	2	C1,C8	Y2K2pF
3	1	C2	470/400
4	2	C3,C4	CP2.2/400
5	2	C5,C6	CD10KpF-1KV
6	1	C7	CP.1uF-400V
7	4	C9,C10,C11,C12	1KpF
8	6	D1,D2,D3,D4,D5,D6	STTH8R06D-RHRP860
9	4	FIX1,FIX2,FIX4,FIX11	FIX35
10	3	FIX6,FIX8,FIX10	FIX-SNAP
11	4	FST1,FST2,H10,H11	FAST-ON
12	1	F1	TMC-PSL5060
13	2	H1,H2	KL105/29
14	1	JP1	KRA3/2
15	1	JP4	STRIP 6
16	2	L1,L2	1.5uH
17	2	MD1,MD2	MODULO MOS
18	4	Q1,Q2,Q3,Q4	STW45NM50-SiG47N60E-GE3
19	1	RV1	VARISTOR-385Vac
20	1	R1	470K
21	2	TSW1,TSW2	TSWTCH42



CONNECT TA NTC INPUT Revised: Monday, June 10, 2013  
CSPSL4280\_TA.DSN Revision: 1

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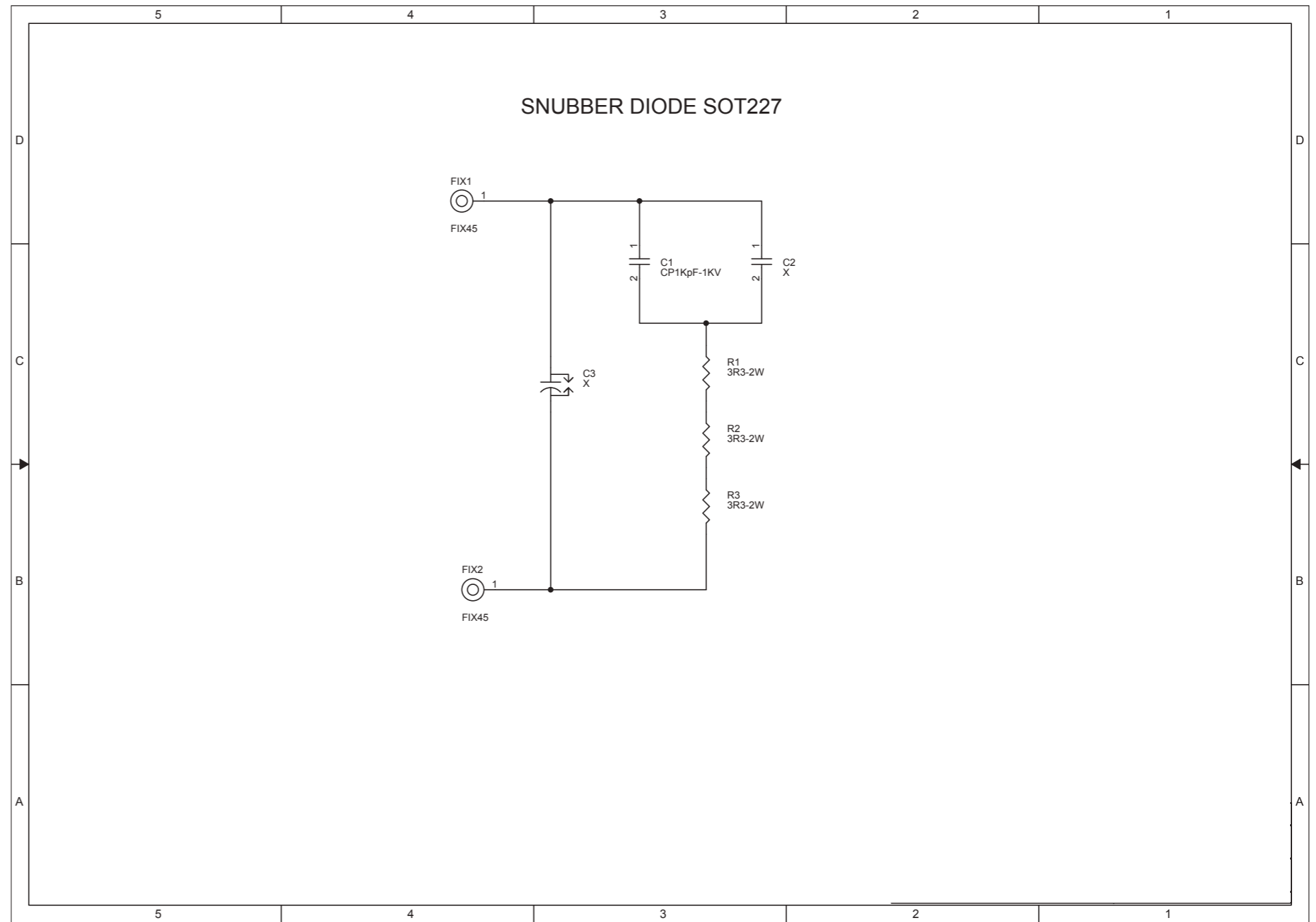
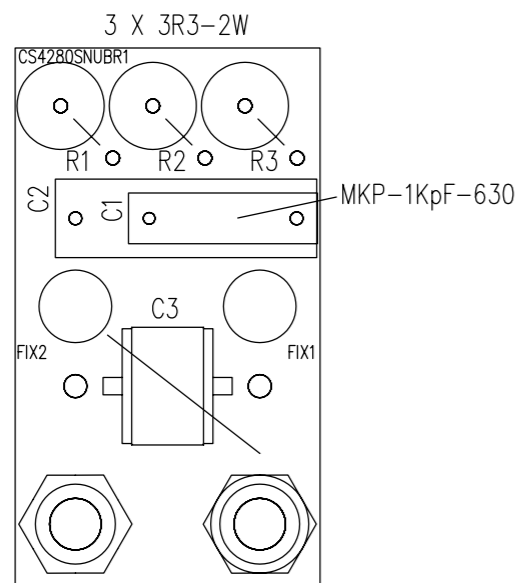
Item	Quantity	Reference	Part
1	1	C2	CM.1uF
2	1	D1	BYV27-200
3	1	JP1	MICS6
4	1	JP2	STRIP-6 90GR
5	1	J1	JUMP 2P
6	1	R1	27R-2W
7	1	R2	330R-1/4W
8	1	R3	470R
9	1	R4	560R-1/4W



CONNECT TA NTC OUT Revised: Monday, June 10, 2013  
CS4280CSOUR0.DSN Revision: 1

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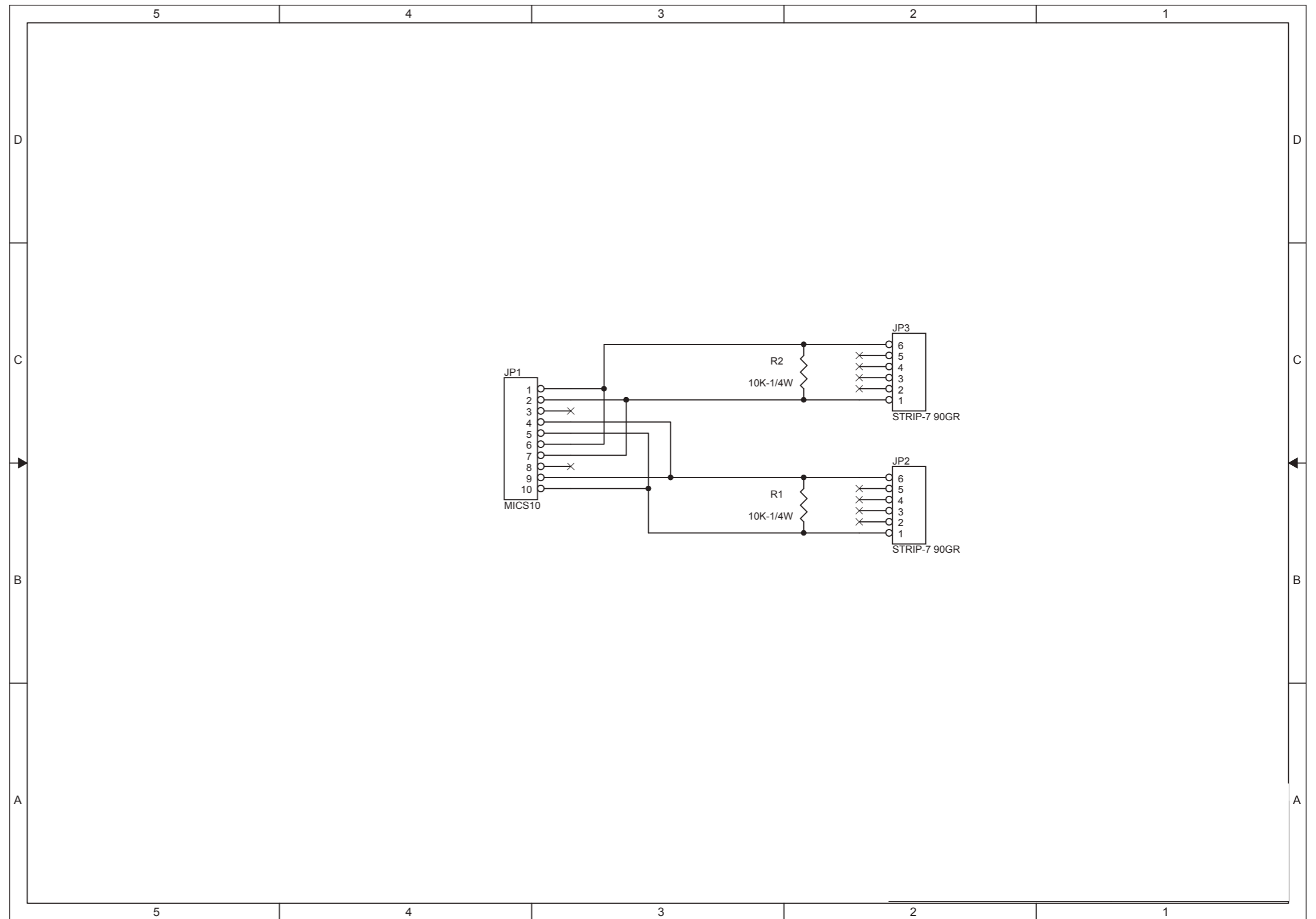
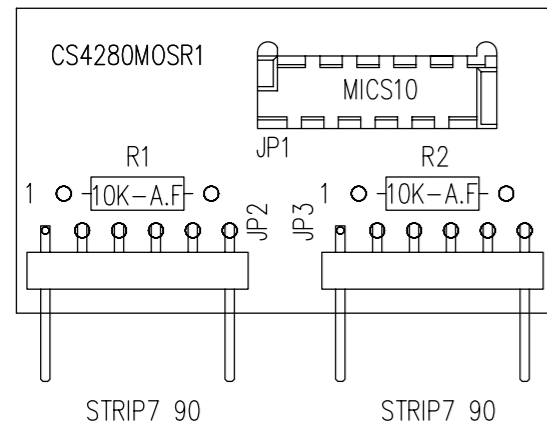
Item	Quantity	Reference	Part
1	2	C1	CM.1uF
		C2	CM.1uF
2	1	JP1	MICS6
3	1	JP2	STRIP7-90GR
4	1	J1	JUMP 2P
5	1	R1	10R-1/4W



SNUBBER DIODE OUT Revised: Monday, June 10, 2013  
CS4280SNUBR0.DSN Revision: 1

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Item	Quantity	Reference	Part
1	1	C1	CP1KpF-1KV
2	2	C2	X
		C3	X
3	2	FIX1	FIX45
		FIX2	FIX45
4	3	R1	3R3-2W
		R2	3R3-2W
		R3	3R3-2W

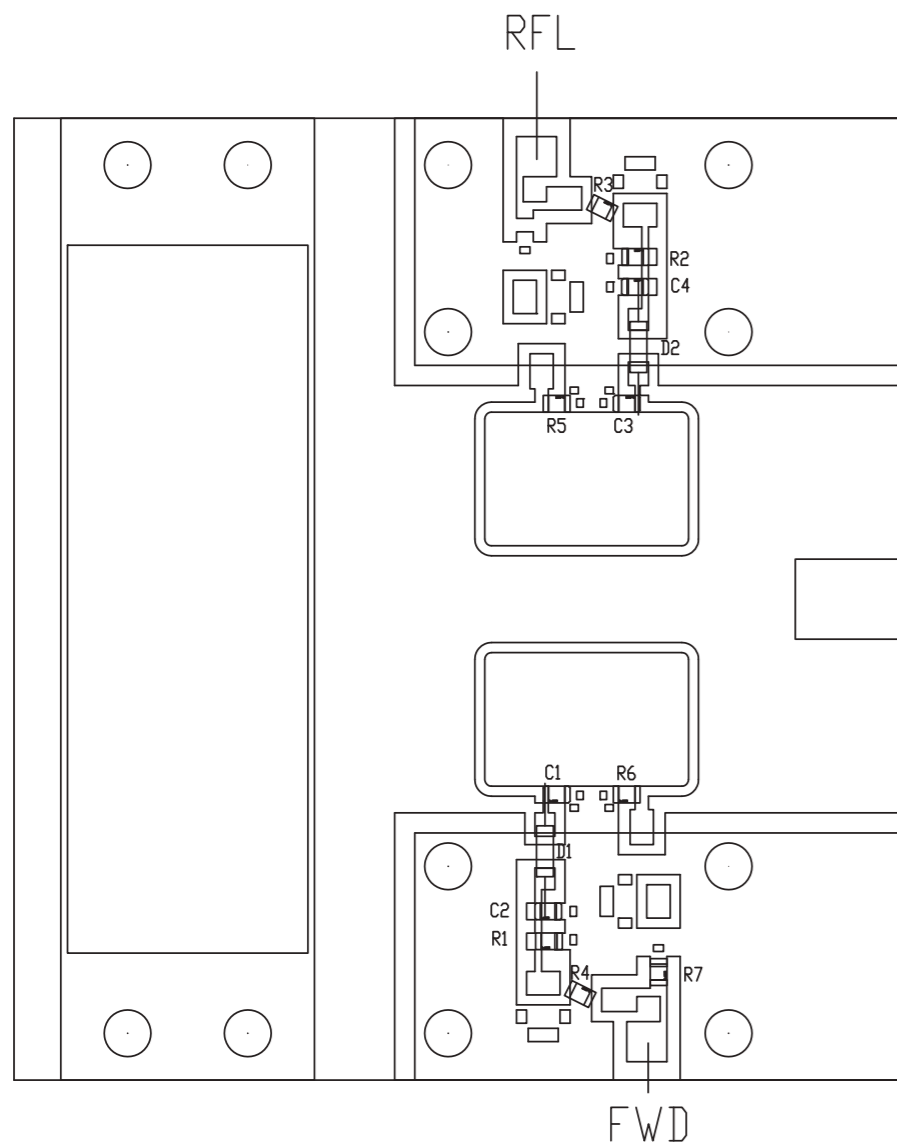


MOSFET Revised: Thursday, April 10, 2014  
CPSL4280\_MOS.DSN Revision: 1

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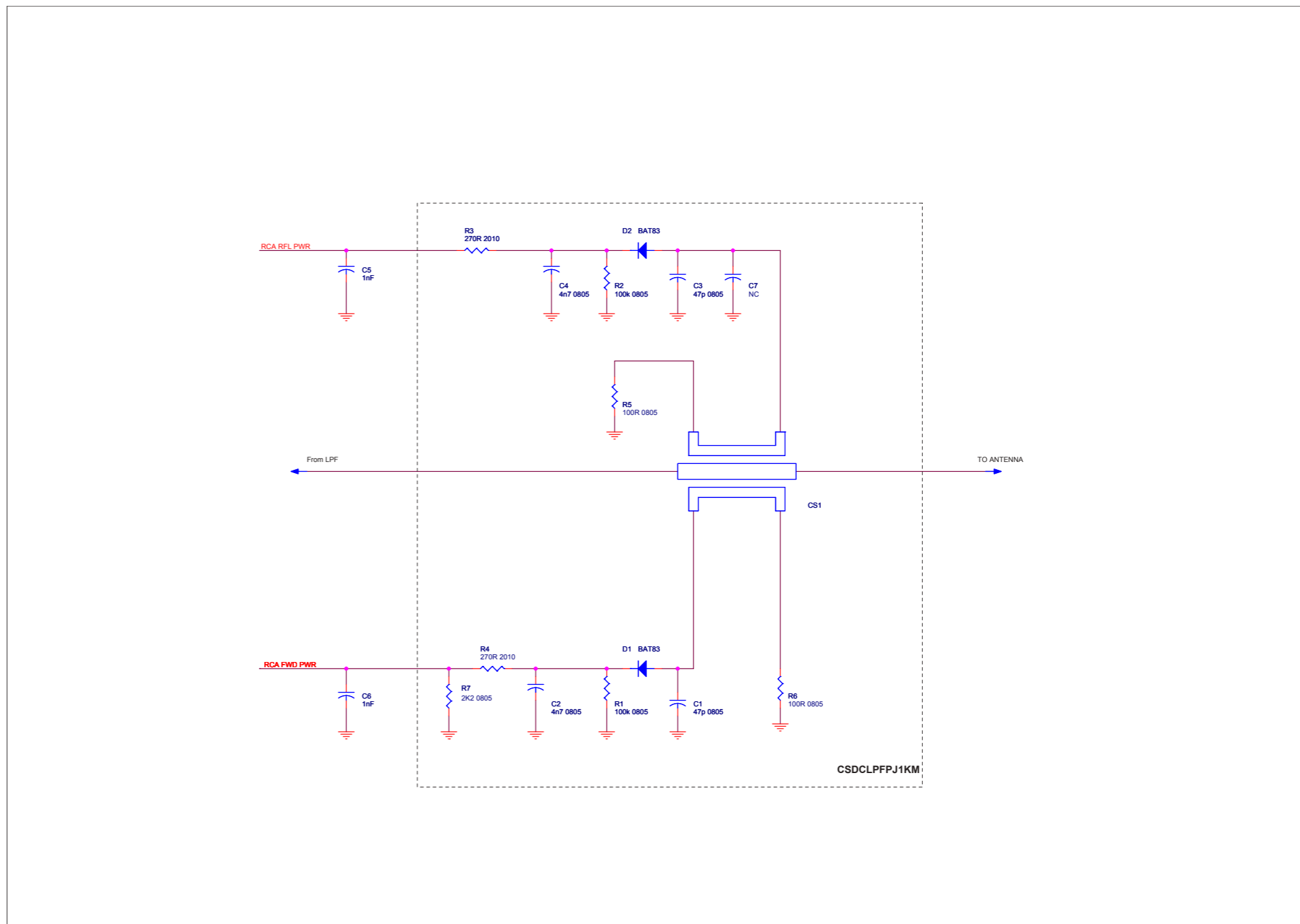
Item	Quantity	Reference Part
1	1	JP1 MICS10
2	2	JP2,JP3 STRIP-7 90GR
3	2	R1,R2 10K-1/4W

Directional coupler (SLDCLPFPJ10KCV)

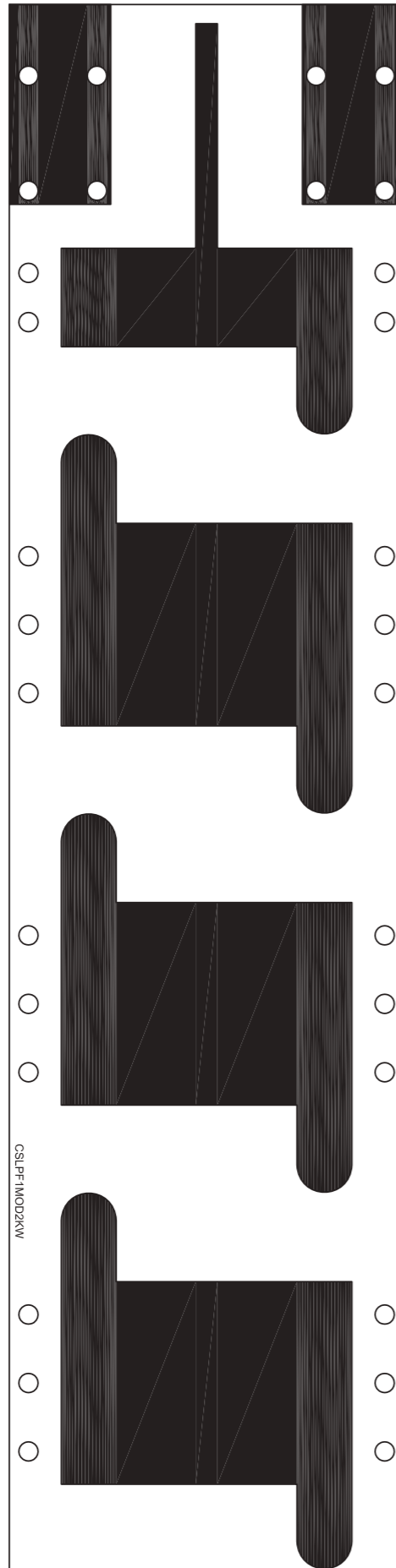


Directional Coupler  
SLDCLPFPJ10CV  
04/02/2014 Revision: 1.1

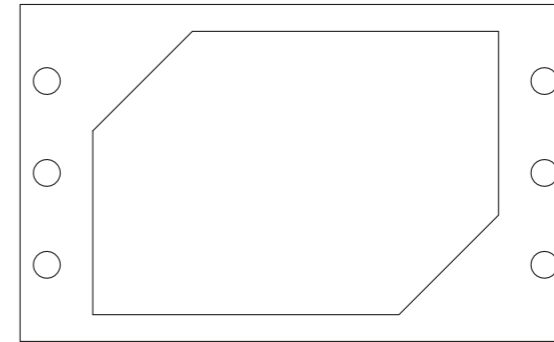
Item	Q.ty	Reference	Part
1	1	CS1	CSDCLPFPJ1KM
2	2	C3,C1	47p 0805
3	2	C4,C2	4n7 0805
4	2	C5,C6	1nF
5	1	C7	NC
6	2	D2,D1	BAT83
7	2	R5,R6	100H 0805
8	2	R2,R1	100k 0805
9	2	R3	270R 2010
10	1	R4	270H 2010
11	1	R7	2K2 0805



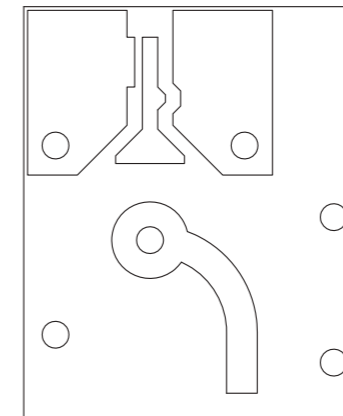
**Low pass filter 1 (CSLPF1MOD2KW)**



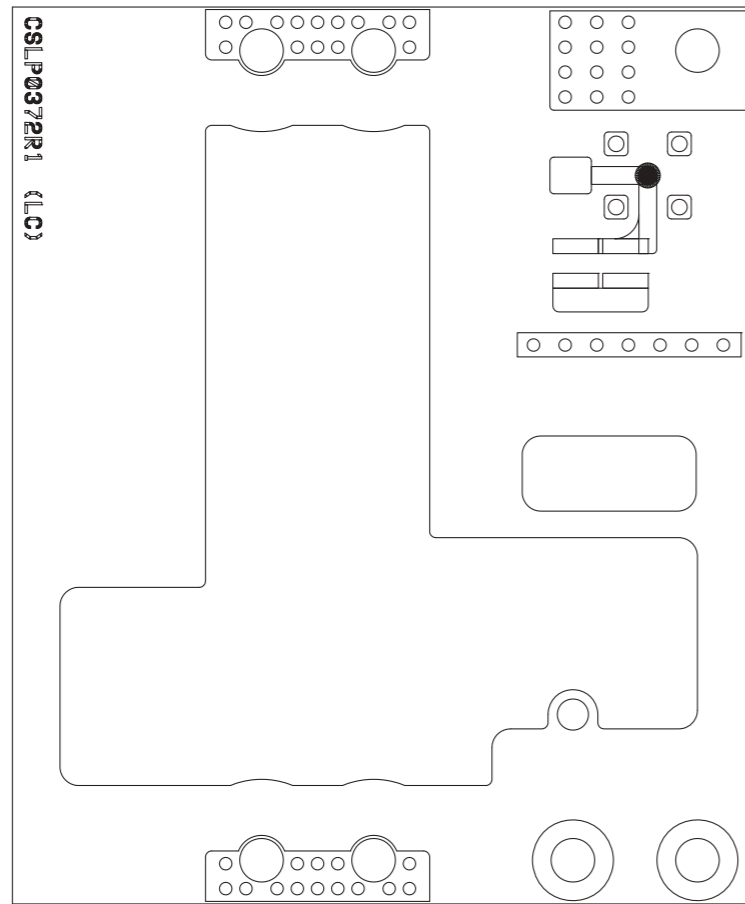
**Capacitor 1 (CSB1LFPJ1KM)**



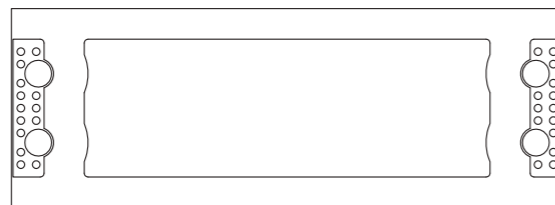
**Card outlet connector (SLOUTRFPJ5K1)**



**First capacitance low pass filter (CSLP0372R1)**

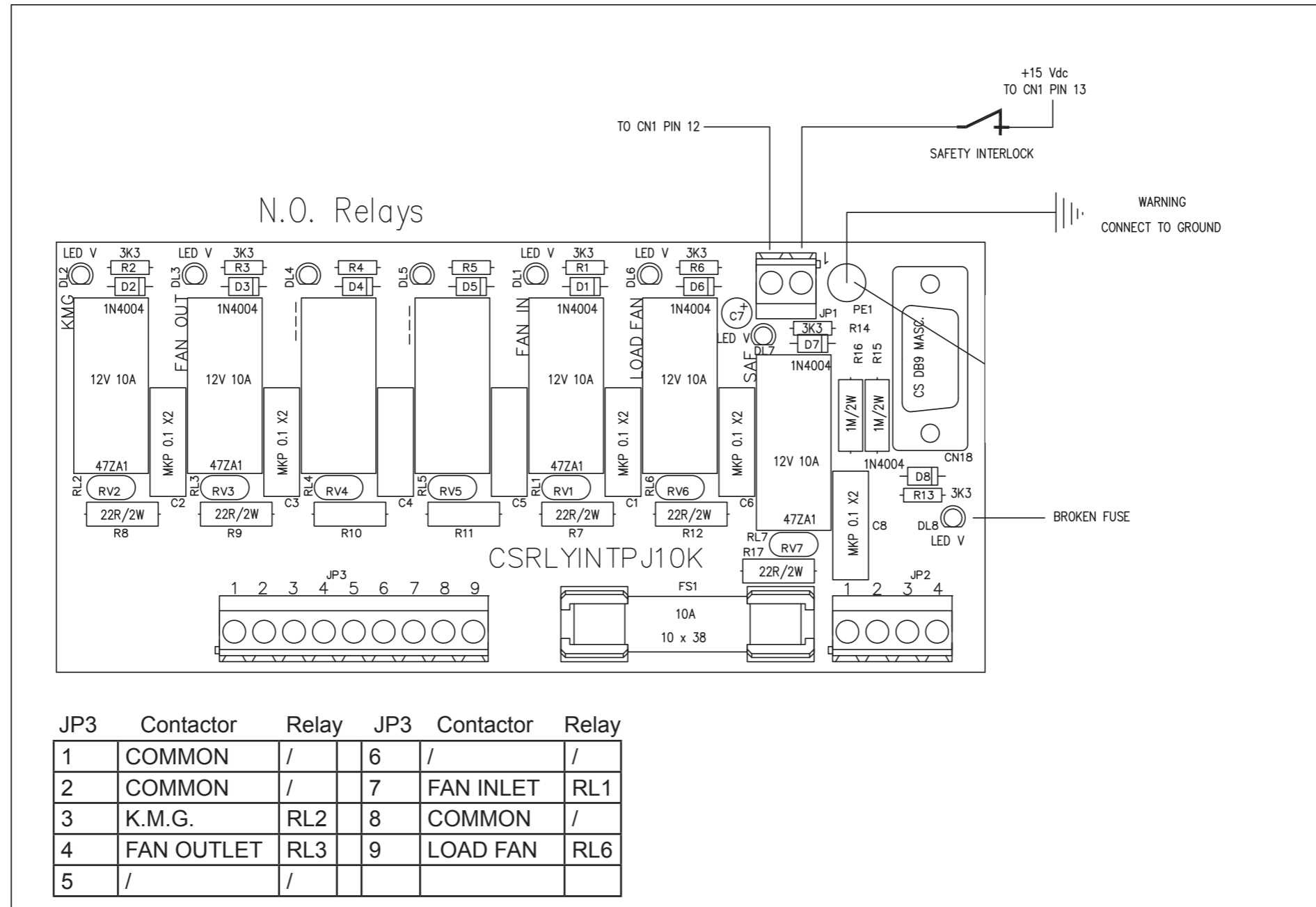


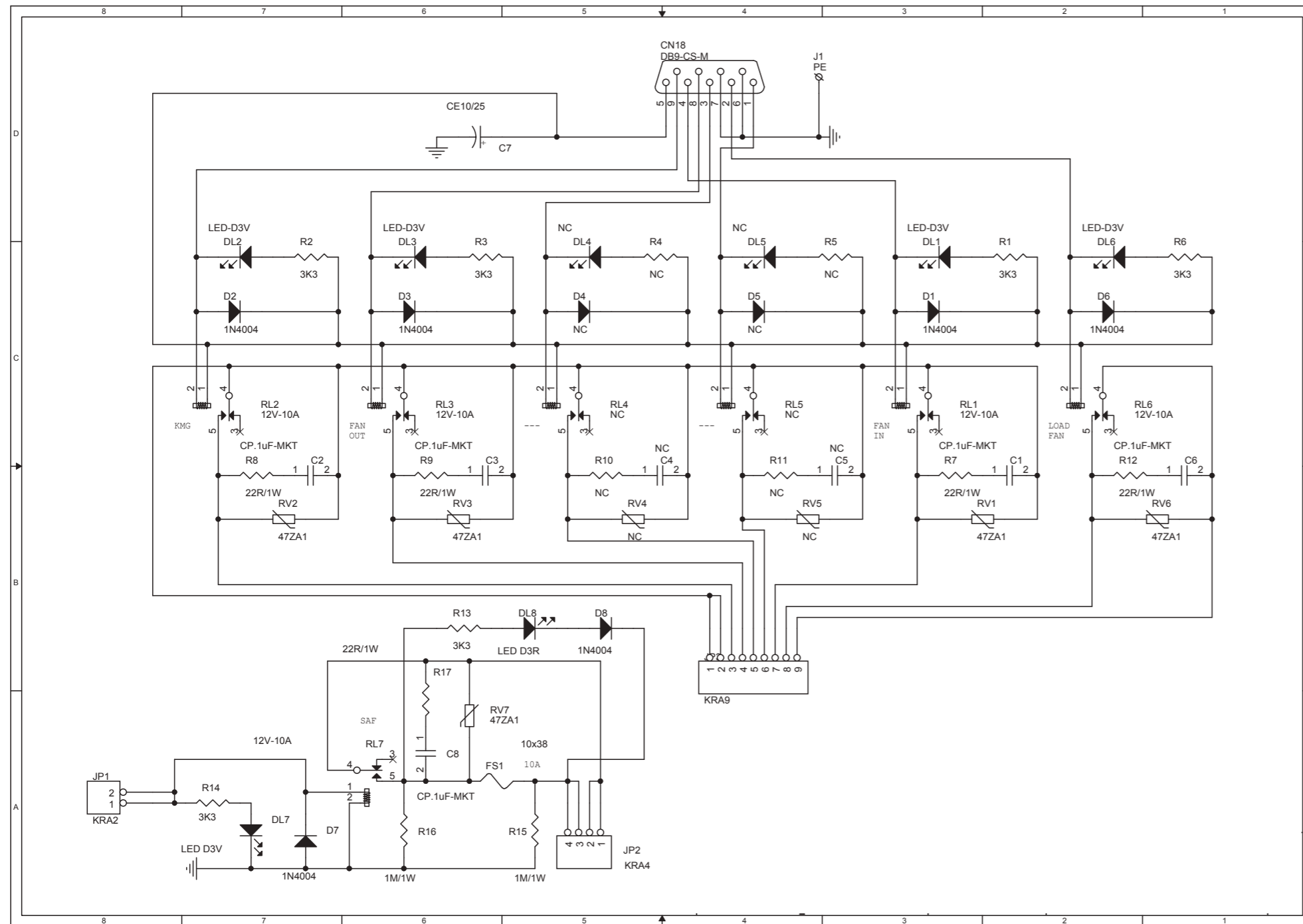
**Low pass filter 2 (CSLPP2MOD2KW)**





Relay interface board (CSRLYINTPJ10K)



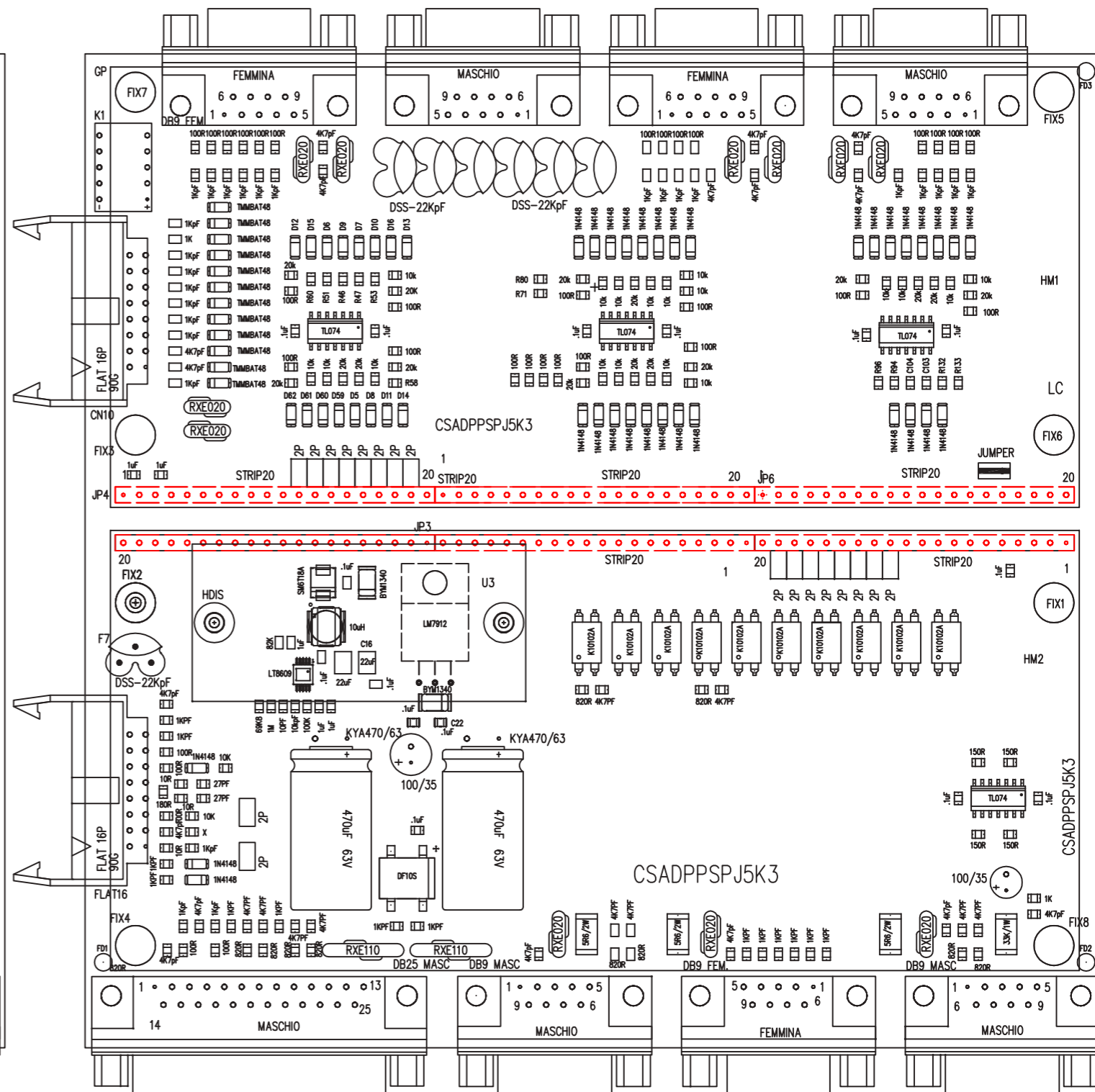
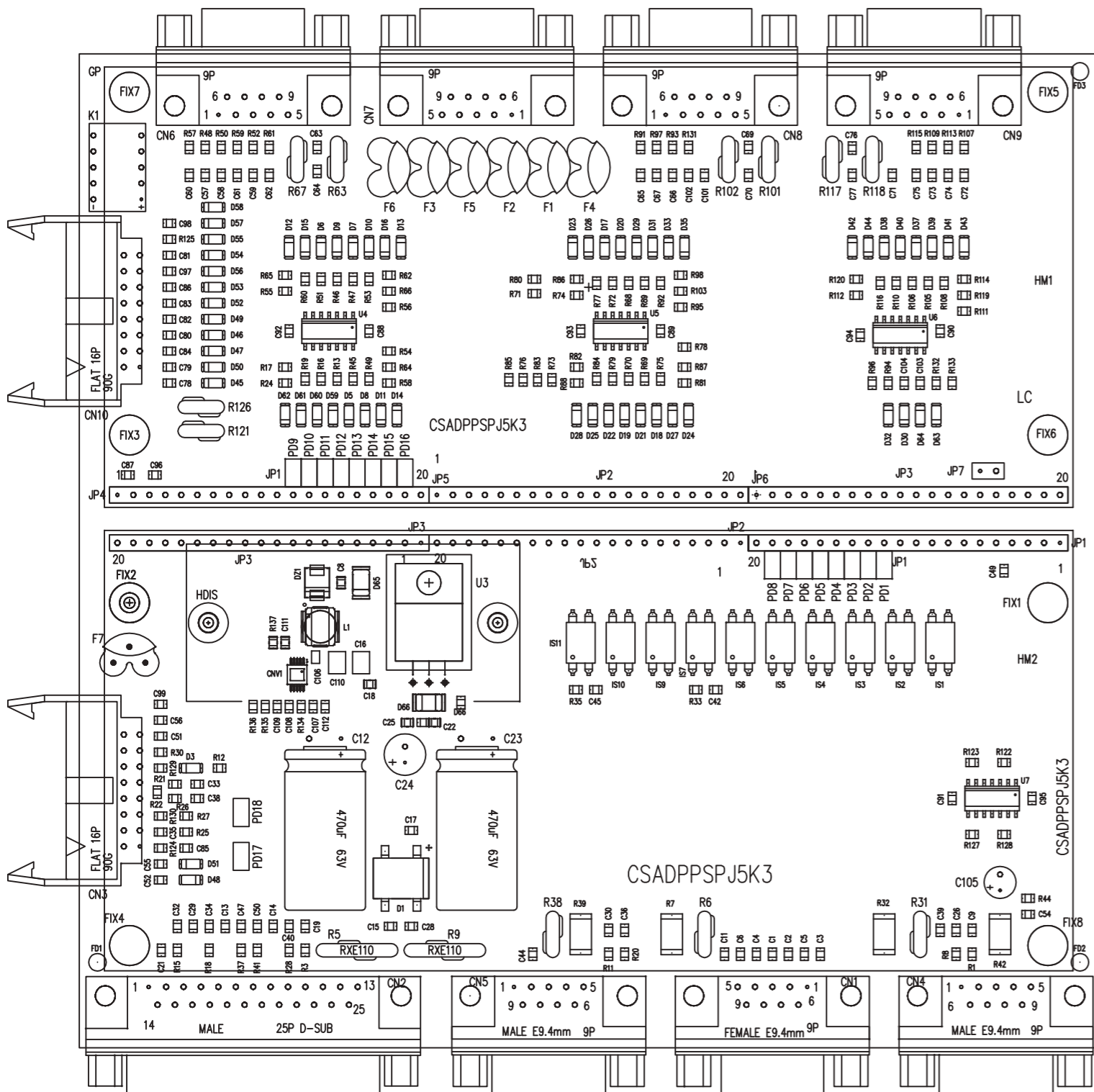


Revised: Friday, March 14, 2014  
Revision:

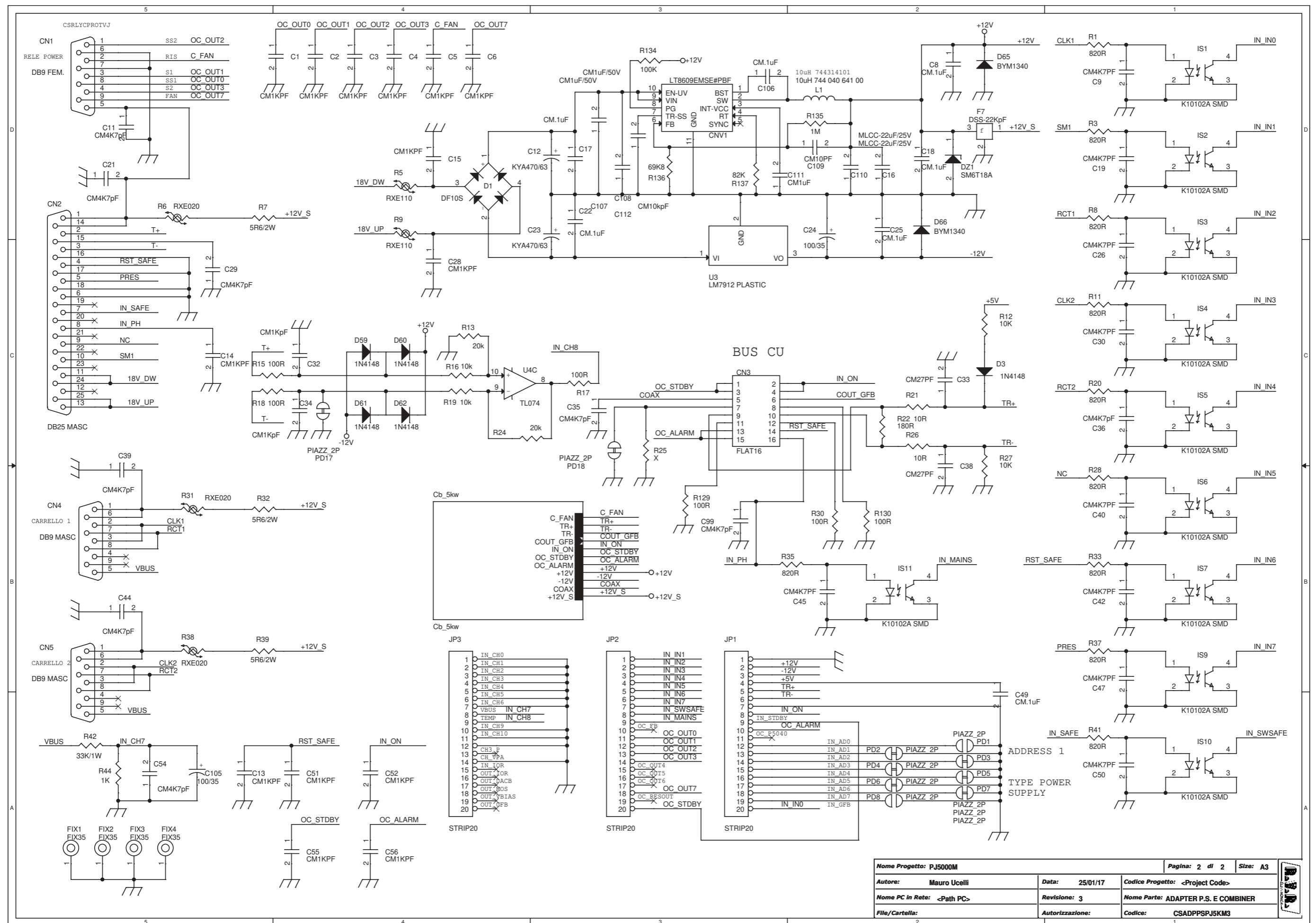
Bill Of Mat Page 1

Item	Quantity	Reference	Part
1	1	CN18	DB9-CS-M
2	5	C1,C2,C3,C6,C8	CP.1uF-MKT
3	14	RV4,RL4,R4,DL4,D4,C4,RV5,RL5,R5,DL5,D5,C5,R10,R11	NC
4	1	C7	CE10/25
5	4	DL1,DL2,DL3,DL6	LED-D3V
6	1	DL7	LED D3V
7	1	DL8	LED D3R
8	6	D1,D2,D3,D6,D7,D8	1N4004
9	1	FS1	10x38
10	1	JP1	KRA2
11	1	JP2	KRA4
12	1	JP3	KRA9
13	1	J1	PE
14	5	RL1,RL2,RL3,RL6,RL7	12V-10A
15	5	RV1,RV2,RV3,RV6,RV7	47ZA1
16	6	R1,R2,R3,R6,R13,R14	3K3
17	5	R7,R8,R9,R12,R17	22R/1W
18	2	R15,R16	1M/1W

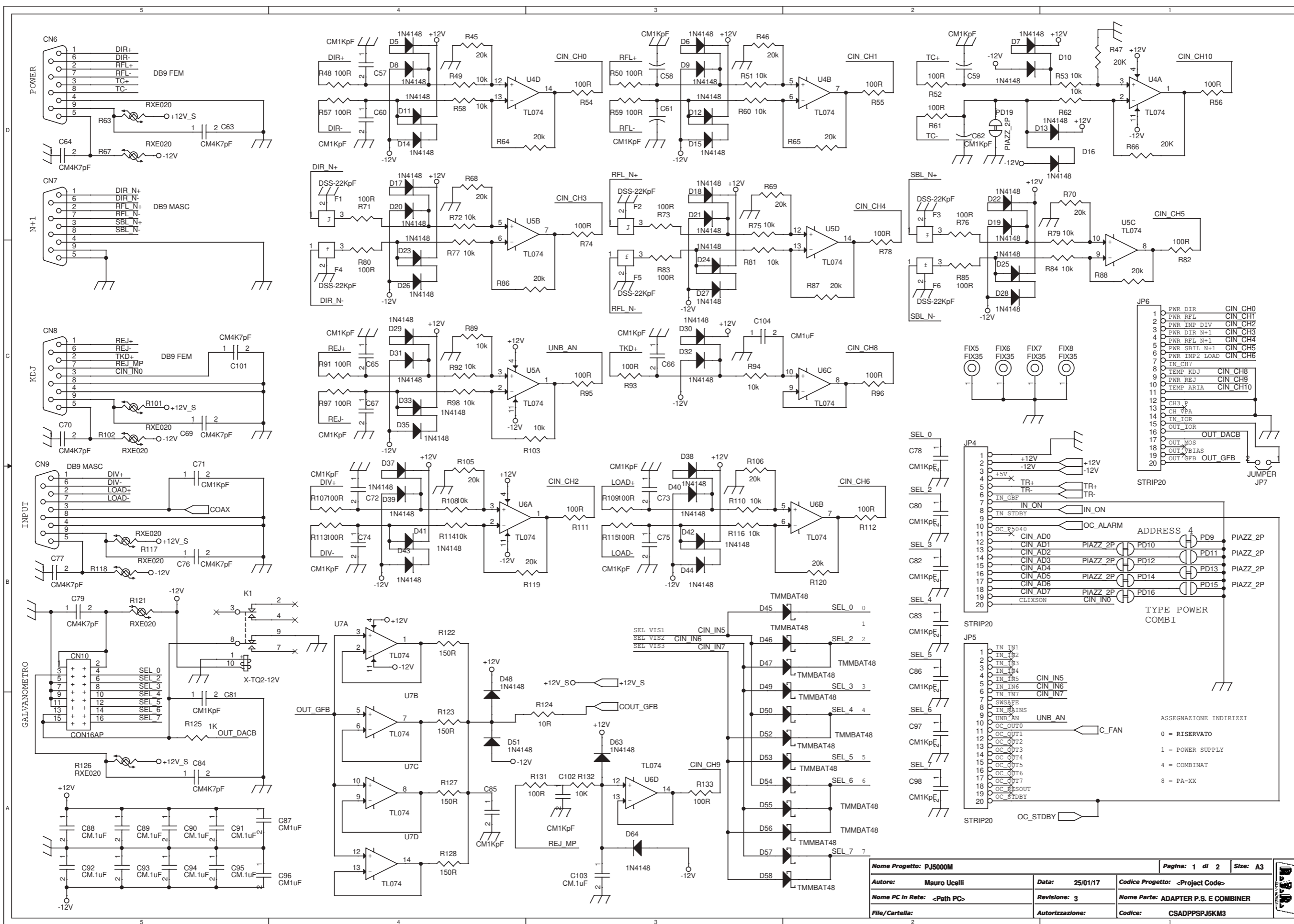
P.S. combiner adapter (SLADPSPJ5KM3)



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DOCUMENT NUMBER CSCPUPJ5KM3_MNT. DWG	REV 3
DATE: 2 AGOSTO 2017	



Nome Progetto: PJ5000M		Pagina: 2 di 2		Size: A3
Autore: Mauro Ucelli	Data: 25/01/17	Codice Progetto: <Project Code>		
Nome PC in Rete: <Path PC>	Revisione: 3	Nome Parte: ADAPTER P.S. E COMBINER		
File/Cartella:	Autorizzazione:	Codice: CSADPPSPJ5KM3		



Nome Progetto: PJ5000M		Pagina: 1 di 2		Size: A3	
Autore: Mauro Ucelli		Data: 25/01/17		Codice Progetto: <Project Code>	
Nome PC in Rete: <Path PC>		Revisione: 3		Nome Parte: ADAPTER P.S. E COMBINER	
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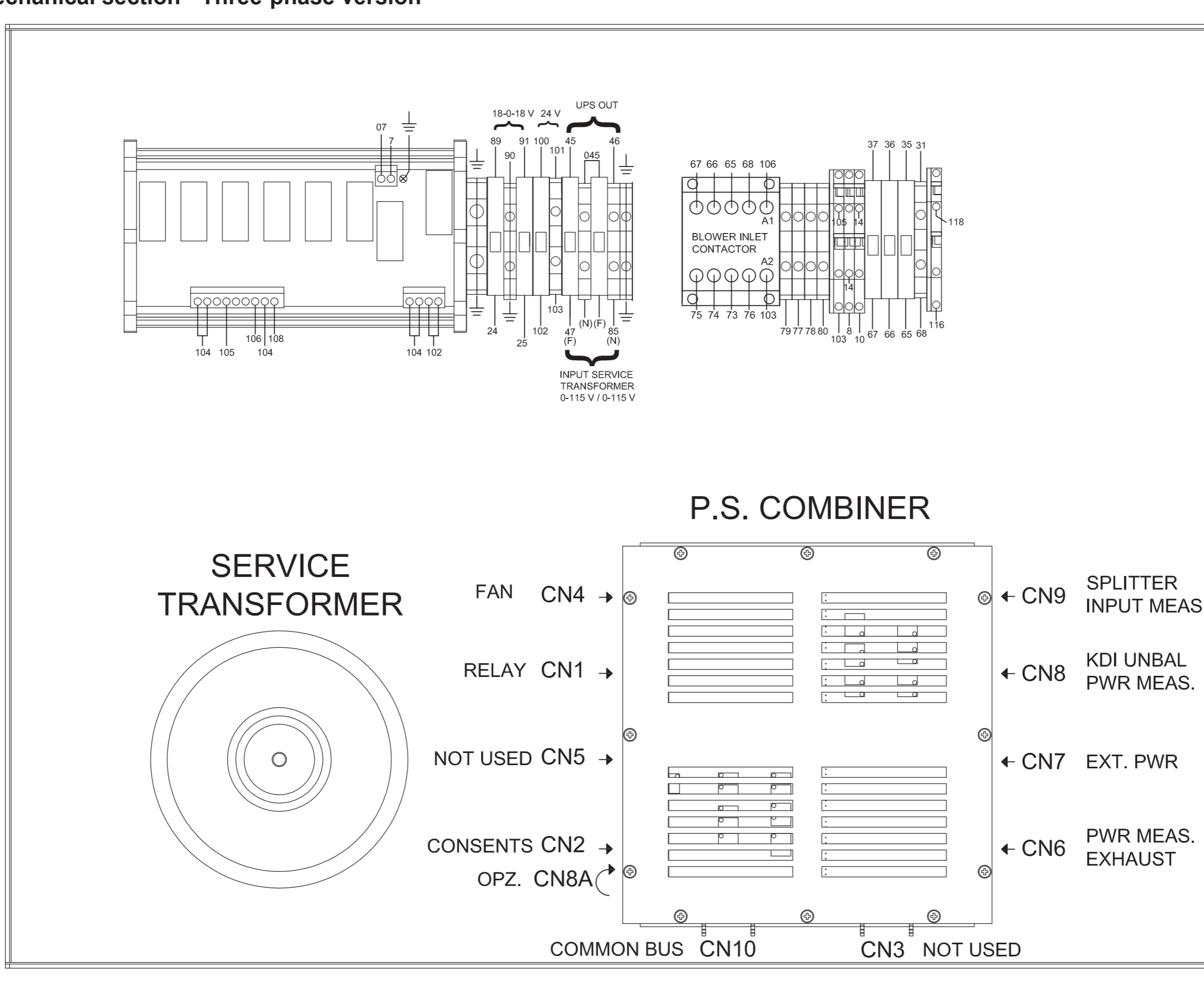
Revised: Wednesday, August 02, 2017  
Revision:

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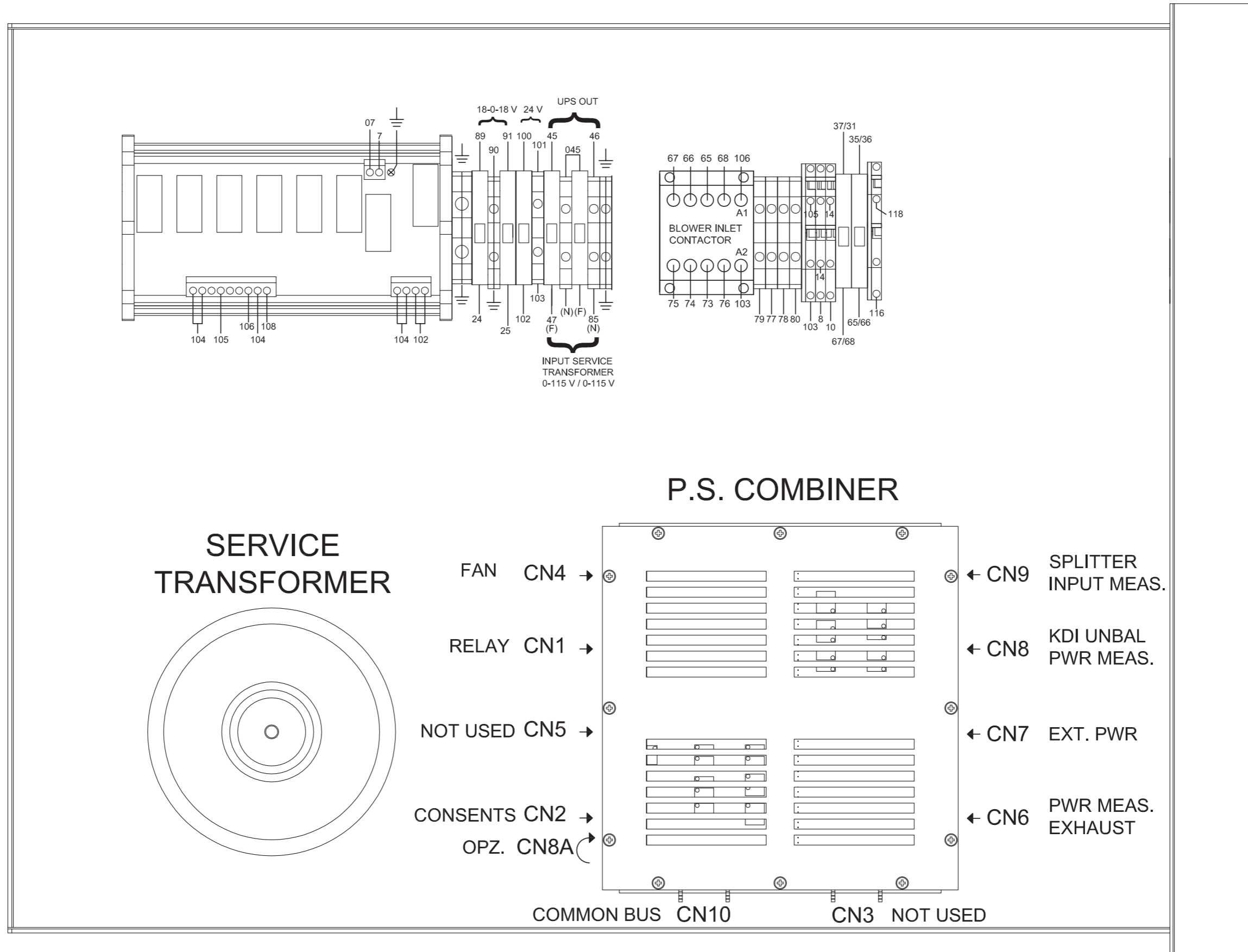
Item	Quantity	Reference	Part
1	1	CNV1	LT8609EMSE#PBF
2	1	CN1	DB9 FEM.
3	1	CN2	DB25 MASC
4	1	CN3	FLAT16
5	4	CN4,CN5,CN7,CN9	DB9 MASC
6	2	CN6,CN8	DB9 FEM
7	1	CN10	CON16AP
8	40	C1,C2,C3,C4,C5,C6,C13, C14,C15,C28,C32,C34,C51, C52,C55,C56,C57,C58,C59, C60,C61,C62,C65,C66,C67, C71,C72,C73,C74,C75,C78, C80,C81,C82,C83,C85,C86, C97,C98,C102	CM1KPF
9	16	C8,C17,C18,C22,C25,C49, C88,C89,C90,C91,C92,C93, C94,C95,C103,C106	CM.1uF
10	27	C9,C11,C19,C21,C26,C29, C30,C35,C36,C39,C40,C42, C44,C45,C47,C50,C54,C63, C64,C69,C70,C76,C77,C79, C84,C99,C101	CM4K7pF
11	2	C12,C23	KYA470/63
12	2	C16,C110	MLCC-22uF/25V
13	2	C24,C105	100/35
14	2	C33,C38	CM27PF
15	4	C87,C96,C104,C111	CM1uF
16	2	C107,C112	CM1uF/50V
17	1	C108	CM10kpF
18	1	C109	CM10PF
19	1	DZ1	SM6T18A
20	1	D1	DF10S
21	47	D3,D5,D6,D7,D8,D9,D10, D11,D12,D13,D14,D15,D16, D17,D18,D19,D20,D21,D22, D23,D24,D25,D26,D27,D28, D29,D30,D31,D32,D33,D35, D37,D38,D39,D40,D41,D42, D43,D44,D48,D51,D59,D60, D61,D62,D63,D64	1N4148
22	12	D45,D46,D47,D49,D50,D52, D53,D54,D55,D56,D57,D58	TMMBAT48
23	2	D65,D66	BYM1340

24	8	FIX1, FIX2, FIX3, FIX4, FIX5, FIX6, FIX7, FIX8	FIX35
25	7	F1, F2, F3, F4, F5, F6, F7	DSS-22KpF
26	10	IS1, IS2, IS3, IS4, IS5, IS6, IS7, IS9, IS10, IS11	K10102A SMD
27	6	JP1, JP2, JP3, JP4, JP5, JP6	STRIP20
28	1	JP7	JUMPER
29	1	K1	X-TQ2-12V
30	1	L1	10uH 744 040 641 00
31	19	PD1, PD2, PD3, PD4, PD5, PD6, PD7, PD8, PD9, PD10, PD11, PD12, PD13, PD14, PD15, PD16, PD17, PD18, PD19	PIAZZ_2P
32	10	R1, R3, R8, R11, R20, R28, R33, R35, R37, R41	820R
33	2	R5, R9	RXE110
34	11	R6, R31, R38, R63, R67, R101, R102, R117, R118, R121, R126	RXE020
35	3	R7, R32, R39	5R6/2W
36	26	R12, R16, R19, R27, R49, R51, R53, R58, R60, R62, R72, R75, R77, R79, R81, R84, R89, R92, R94, R98, R103, R108, R110, R114, R116, R132	10k
37	18	R13, R24, R45, R46, R47, R64, R65, R66, R68, R69, R70, R86, R87, R88, R105, R106, R119, R120	20k
38	37	R15, R17, R18, R30, R48, R50, R52, R54, R55, R56, R57, R59, R61, R71, R73, R74, R76, R78, R80, R82, R83, R85, R91, R93, R95, R96, R97, R107, R109, R111, R112, R113, R115, R129, R130, R131, R133	100R
39	3	R21, R26, R124	10R
40	1	R22	180R
41	1	R25	X
42	1	R42	33K/1W
43	2	R44, R125	1K
44	4	R122, R123, R127, R128	150R
45	1	R134	100K
46	1	R135	1M
47	1	R136	69K8
48	1	R137	82K
49	1	U3	LM7912 PLASTIC
50	4	U4, U5, U6, U7	TL074

**Electromechanical section - Three-phase version**

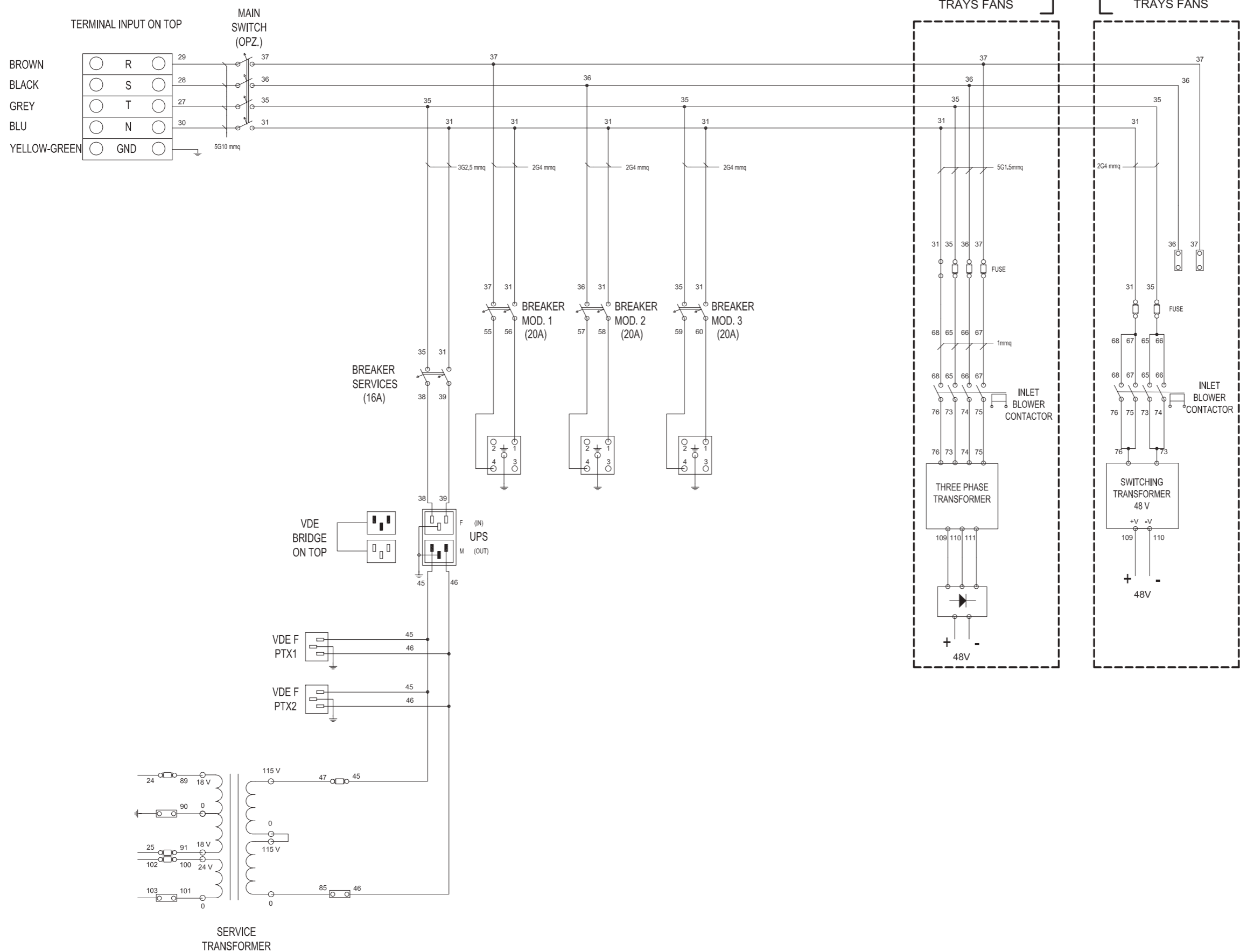


**Electromechanical section - Mono-phase version**

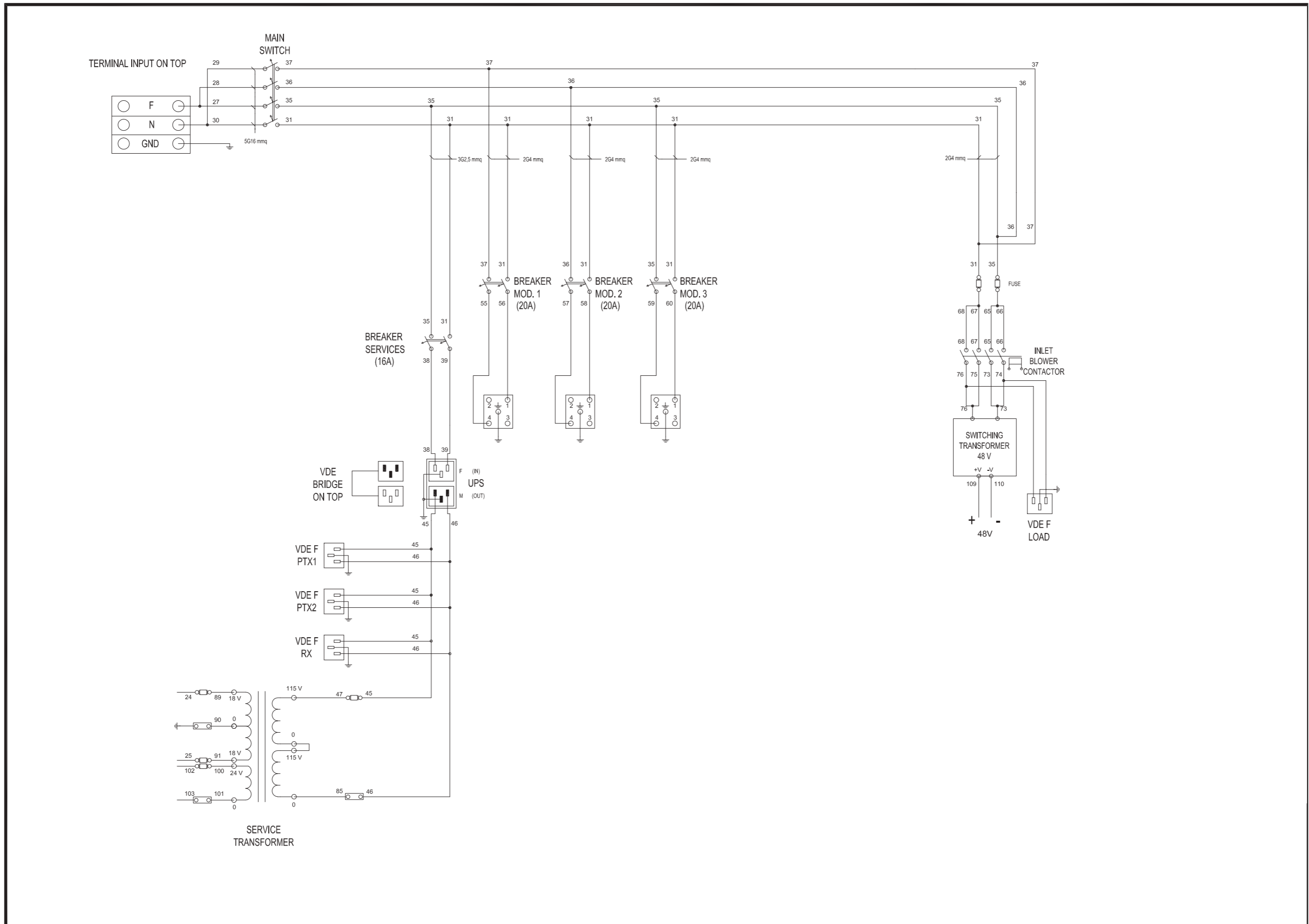




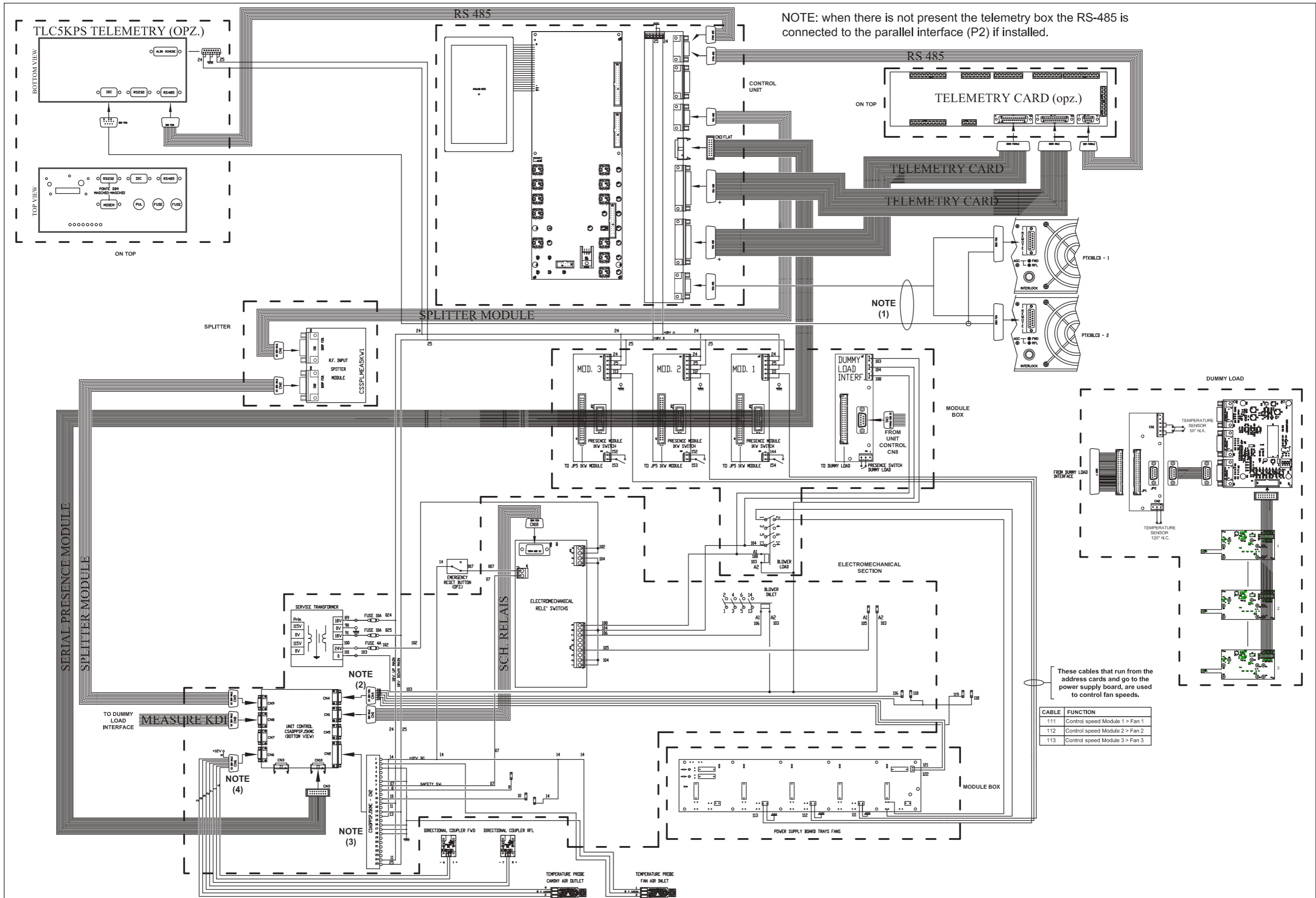
### Wiring diagram three-phase version



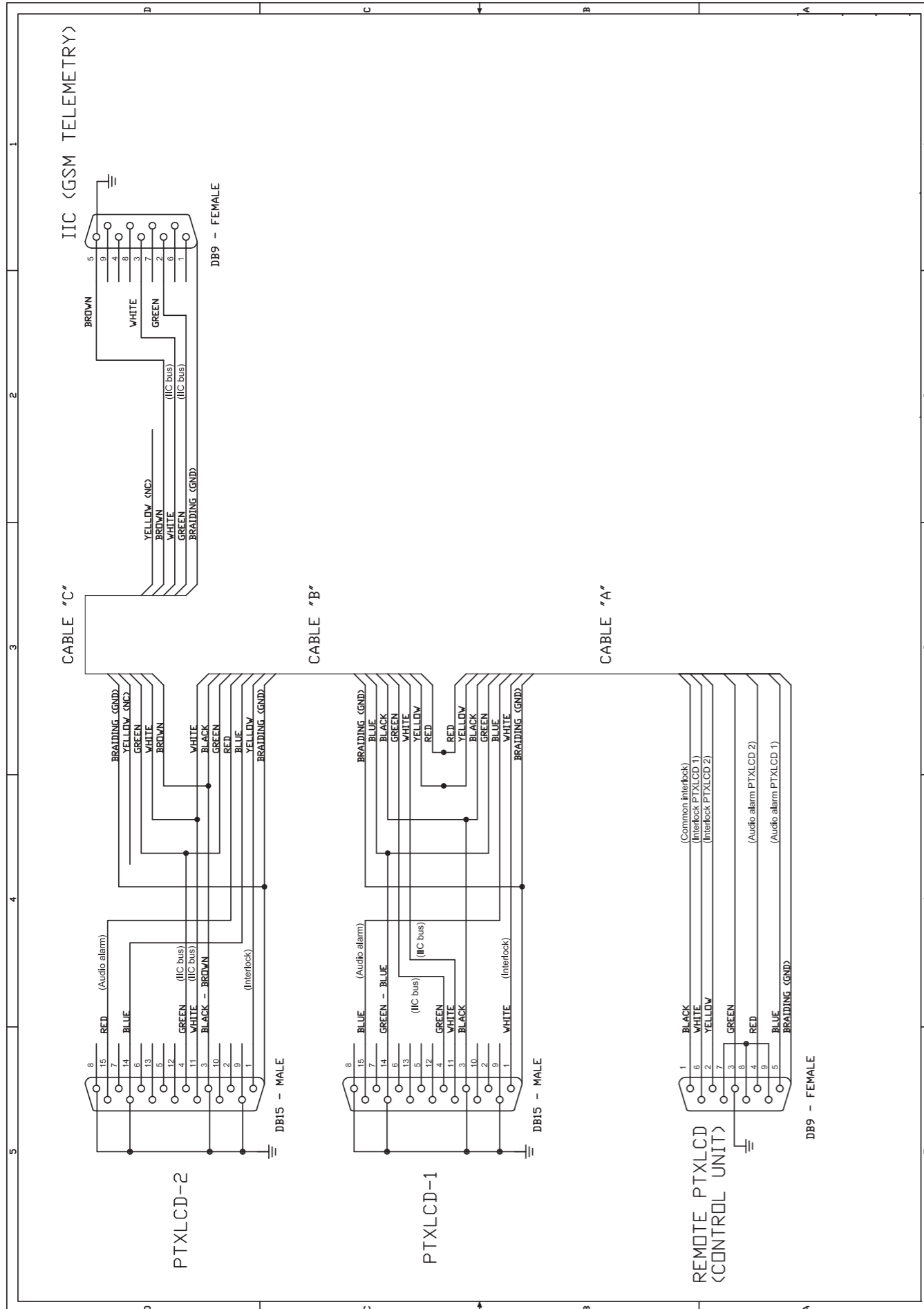
**Wiring diagram mono-phase version**



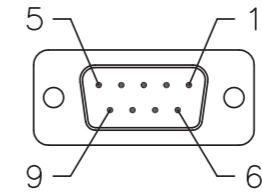
**Low tension and signal wiring diagram**



NOTE (1)

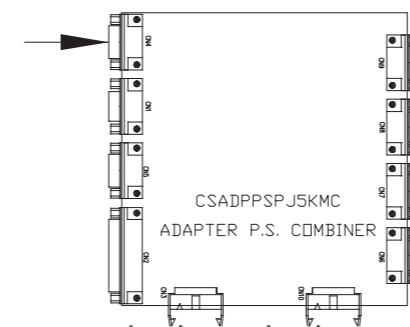


NOTE (2)

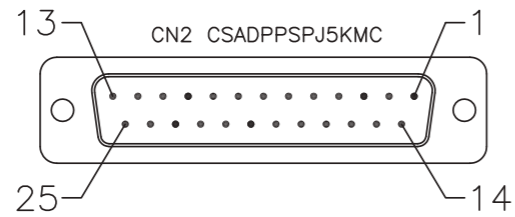


9 Pin Female Connector to CN4

Pin n°	Description	Cable number
1	+ 12V DC	118
2	BLOWER OUTLET THERMOSTAT	119
3		
4		
5	V FAN	122
6		
7	BLOWER OUTLET OVERLOAD	116
8		
9		
CASE	GND V FAN	121

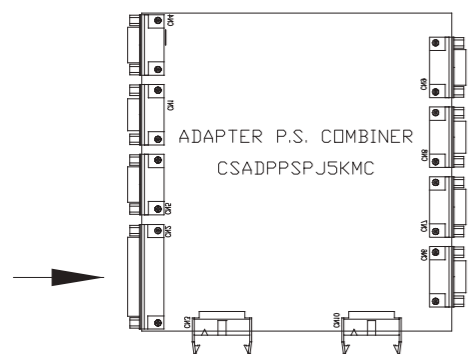
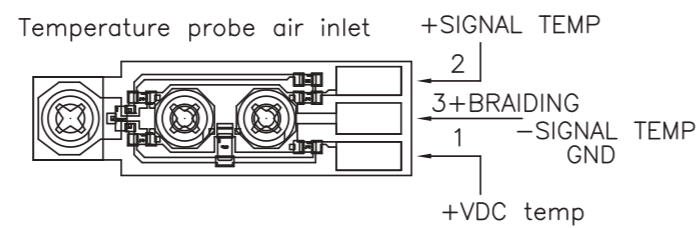


**NOTE (3)**

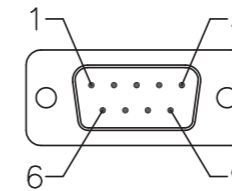


25 Pin Female Connector

Pin/cable n°	Description
1	+12V DC and VDC TEMP
2	+ SIGNAL TEMP
3	- SIGNAL TEMP
4	NC
5	NC
6	BRAIDING
7	EMERGENCY BUTTON
8	MAINS OK
10	BLOWER INLET OVERLOAD
11	POWER SUPPLY 18V UP
13	POWER SUPPLY 18V DW
14	+12V DC and VDC TEMP
15	NC
16	GND
17	GND
18	GND
19	NC
20	NC
21	NC
22	NC
23	NC
24	POWER SUPPLY 18V UP
25	POWER SUPPLY 18V DW

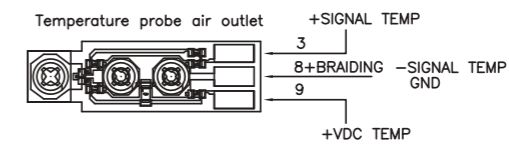


**NOTE (4)**

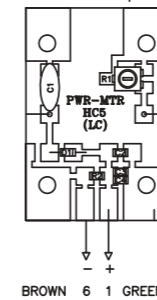


9 Pin Male Connector  
to CN6-CSADPPSPJ5KMC

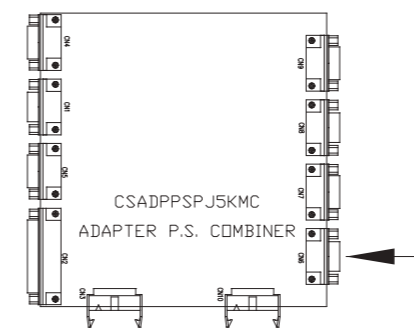
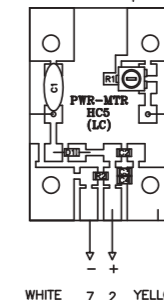
Pin n°	Description	Cable color
1	Power FWD (+)	GREEN
2	Power RFL (+)	YELLOW
3	+ SIGNAL TEMP	BROWN
4	GND	BRAIDING
5		
6	Power FWD (-)	BROWN
7	Power RFL (-)	WHITE
8	-SIGNAL TEMP	WHITE
9	+VDC TEMP (12V)	YELLOW



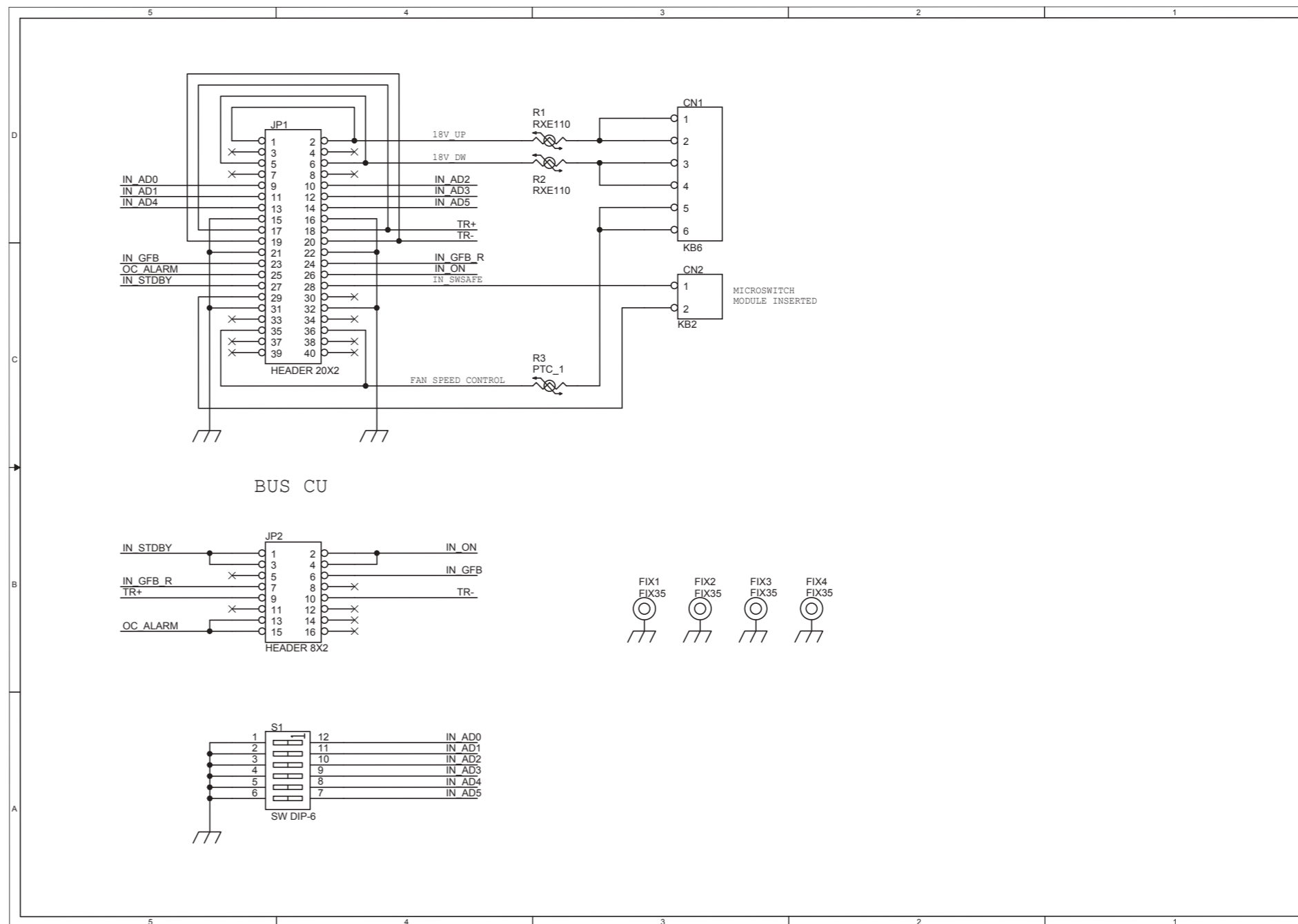
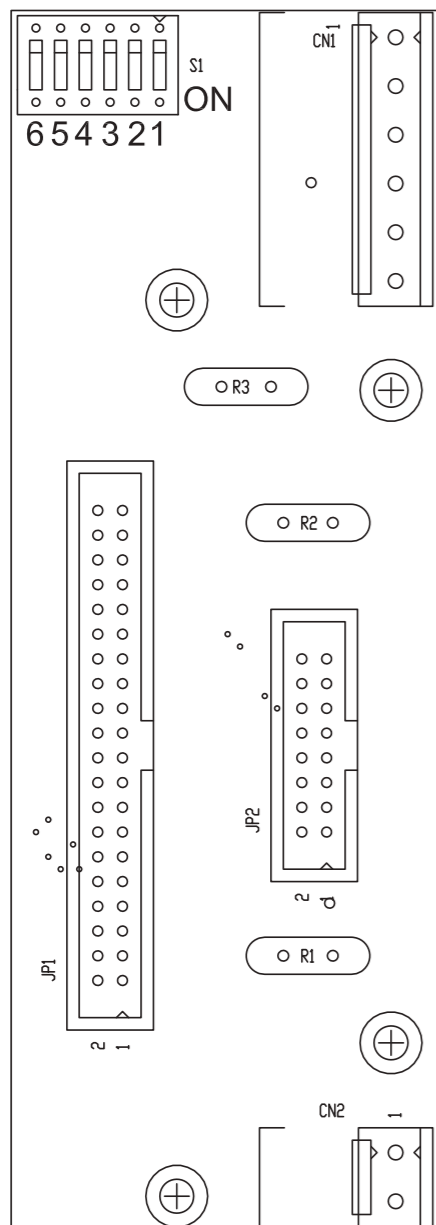
Directional coupler FWD



Directional coupler RFL



**RF module I/O interface (SLIORFPJ5KM2)**



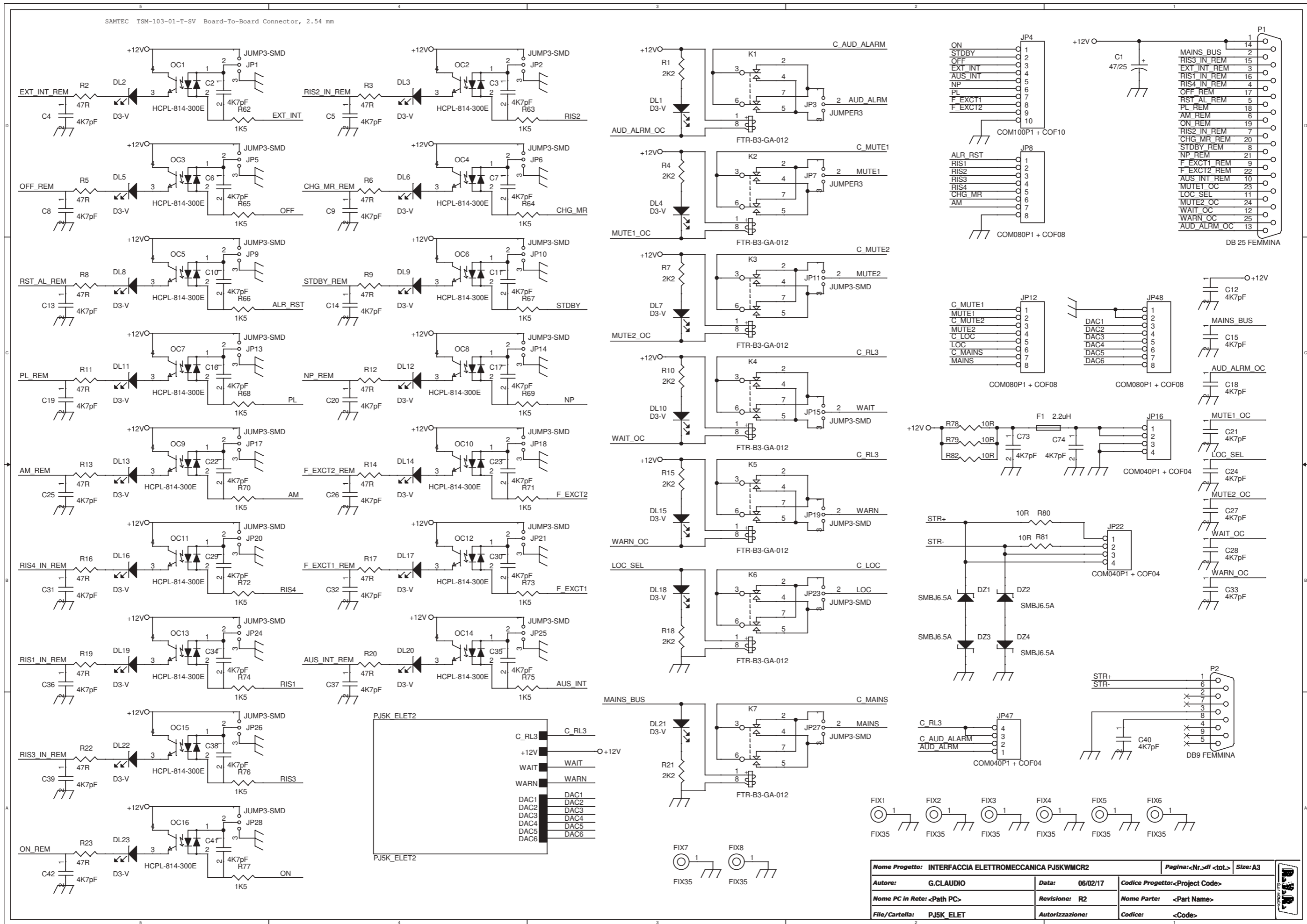
**CSIORFPJ5KM2**

Bill Of Materials

Page1

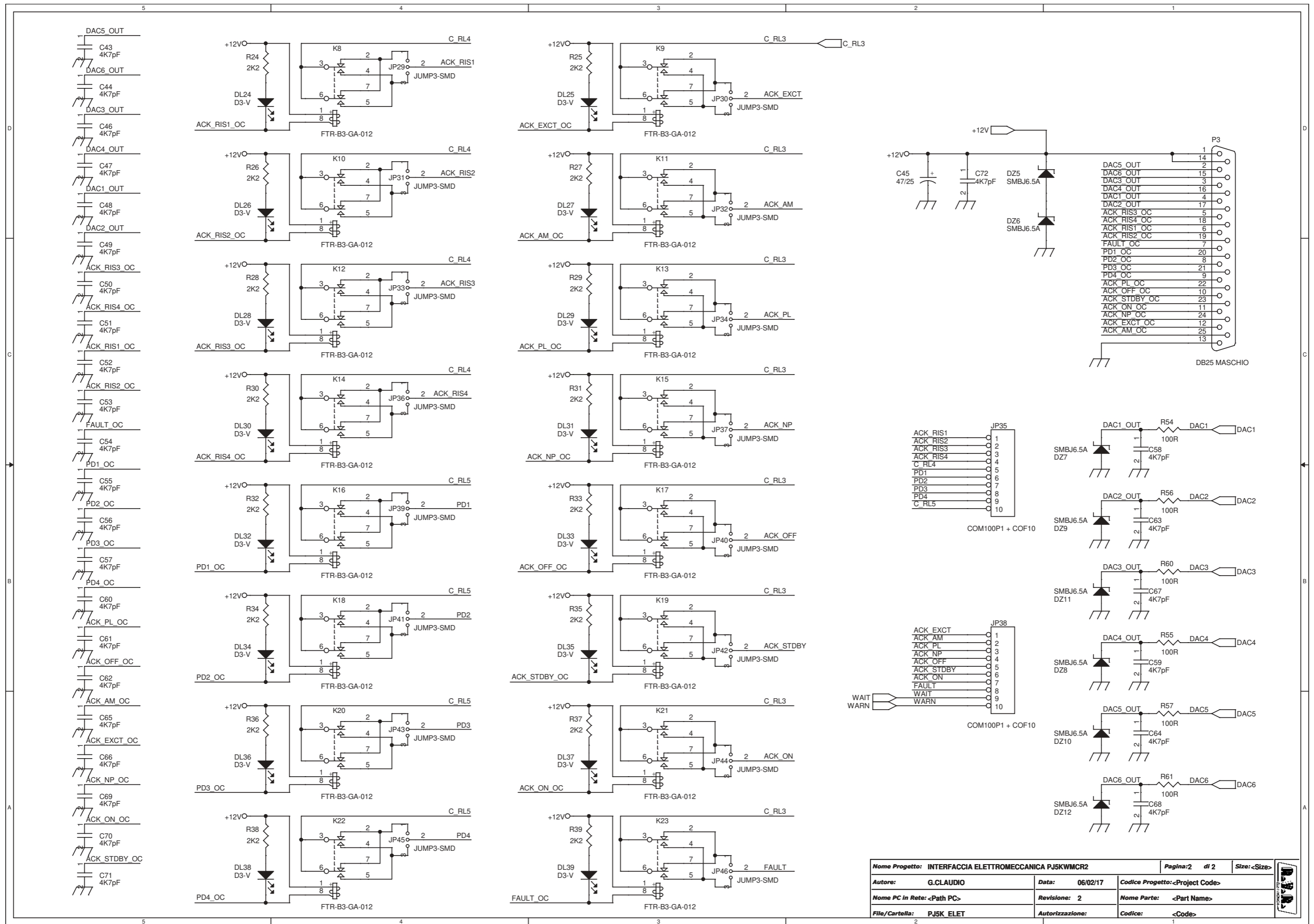
Item	Q.ty	Reference	Part
1	1	CN1	KB6
2	1	CN2	KB2
3	4	FIX1, FIX2, FIX3, FIX4	FIX35
4	1	JP1	HEADER
5	1	JP2	HEADER
6	2	R2, R1	RXE110
7	1	R3	PTC_1
8	1	S1	SW DIP-6





Nome Progetto: INTERFACCIA ELETTROMECCANICA PJ5KWMCR2		Pagina: <nr.> di <tot.>		Size: A3
Autore: G.CLAUDIO	Data: 06/02/17	Codice Progetto: <Project Code>		
Nome PC in Rete: <Path PC>	Revisione: R2	Nome Parte: <Part Name>		
File/Cartella: PJ5K_ELET	Autorizzazione:	Codice: <Code>		





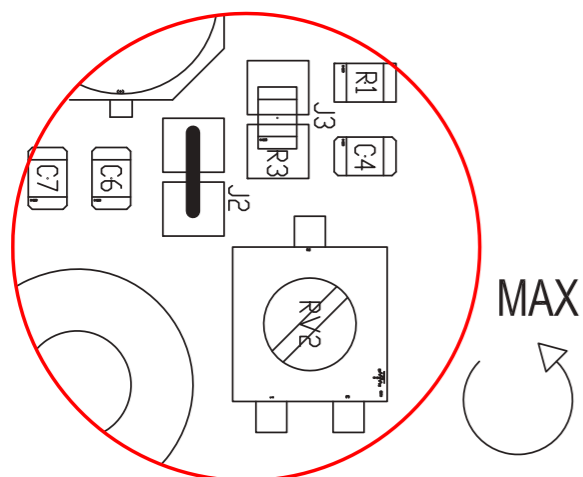
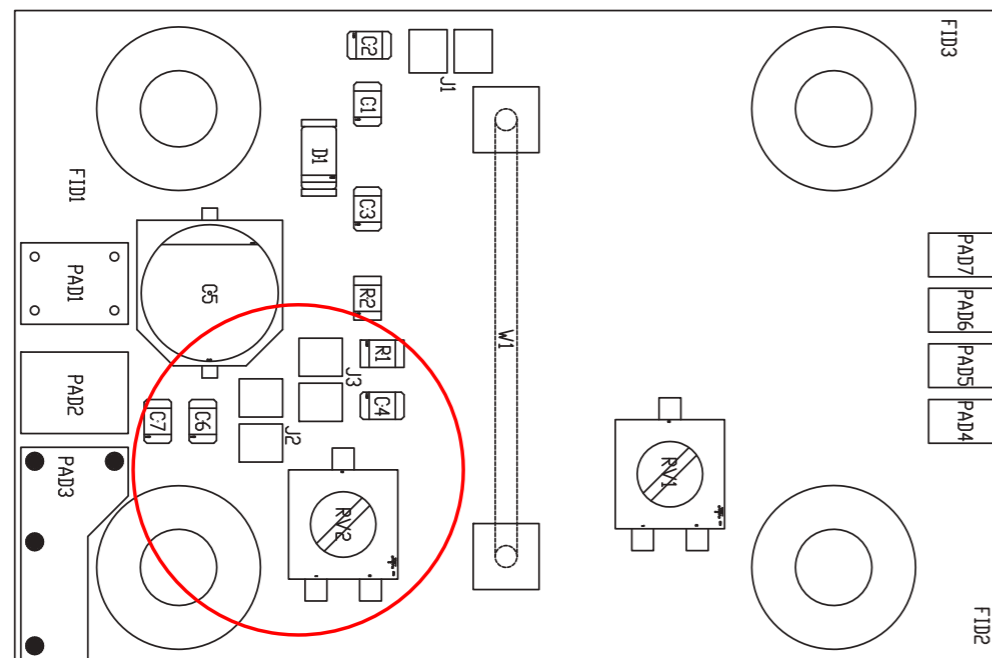
Revised: Wednesday, August 02, 2017  
Revision:

Bill Of Materials May 9, 2019 10:00:55 Page1

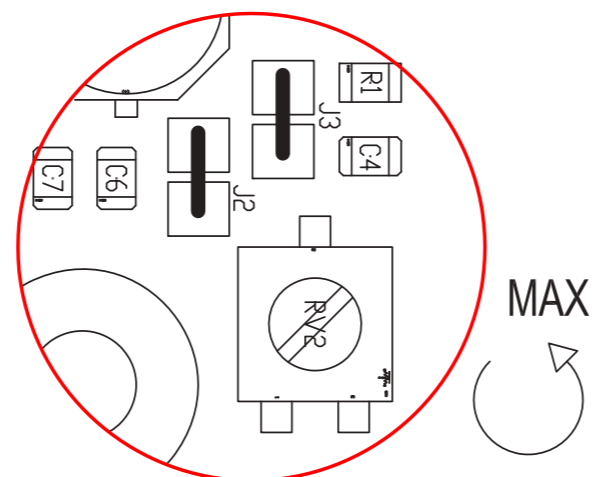
Item	Quantity	Reference	Part
1	2	C1, C45	47/25
2	72	C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C29, C30, C31, C32, C33, C34, C35, C36, C37, C38, C39, C40, C41, C42, C43, C44, C46, C47, C48, C49, C50, C51, C52, C53, C54, C55, C56, C57, C58, C59, C60, C61, C62, C63, C64, C65, C66, C67, C68, C69, C70, C71, C72, C73, C74	4K7pF
3	39	DL1, DL2, DL3, DL4, DL5, DL6, DL7, DL8, DL9, DL10, DL11, DL12, DL13, DL14, DL15, DL16, DL17, DL18, DL19, DL20, DL21, DL22, DL23, DL24, DL25, DL26, DL27, DL28, DL29, DL30, DL31, DL32, DL33, DL34, DL35, DL36, DL37, DL38, DL39	D3-V
4	12	DZ1, DZ2, DZ3, DZ4, DZ5, DZ6, DZ7, DZ8, DZ9, DZ10, DZ11, DZ12	SMBJ6.5A
5	8	FIX1, FIX2, FIX3, FIX4, FIX5, FIX6, FIX7, FIX8	FIX35
6	1	F1	2.2uH
7	37	JP1, JP2, JP5, JP6, JP9, JP10, JP11, JP13, JP14, JP15, JP17, JP18, JP19, JP20, JP21, JP23, JP24, JP25, JP26, JP27, JP28, JP29, JP30, JP31, JP32, JP33, JP34, JP36, JP37, JP39, JP40, JP41, JP42, JP43, JP44, JP45, JP46	JUMP3-SMD
8	2	JP3, JP7	JUMPER3
9	3	JP4, JP35, JP38	COM100P1 + COF10
10	3	JP8, JP12, JP48	COM080P1 + COF08
11	3	JP16, JP22, JP47	COM040P1 + COF04
12	23	K1, K2, K3, K4, K5, K6, K7, K8, K9, K10, K11, K12, K13, K14, K15, K16, K17, K18, K19, K20, K21, K22, K23	FTR-B3-GA-012

13	16	OC1, OC2, OC3, OC4, OC5, OC6, OC7, OC8, OC9, OC10, OC11, OC12, OC13, OC14, OC15, OC16	HCPL-814-300E
14	1	P1	DB 25 FEMMINA
15	1	P2	DB9 FEMMINA
16	1	P3	DB25 MASCHIO
17	23	R1, R4, R7, R10, R15, R18, R21, R24, R25, R26, R27, R28, R29, R30, R31, R32, R33, R34, R35, R36, R37, R38, R39	2K2
18	16	R2, R3, R5, R6, R8, R9, R11, R12, R13, R14, R16, R17, R19, R20, R22, R23	47R
19	6	R54, R55, R56, R57, R60, R61	100R
20	16	R62, R63, R64, R65, R66, R67, R68, R69, R70, R71, R72, R73, R74, R75, R76, R77	1K5
21	5	R78, R79, R80, R81, R82	10R

Directional coupler (SL042MT1001)



FWD



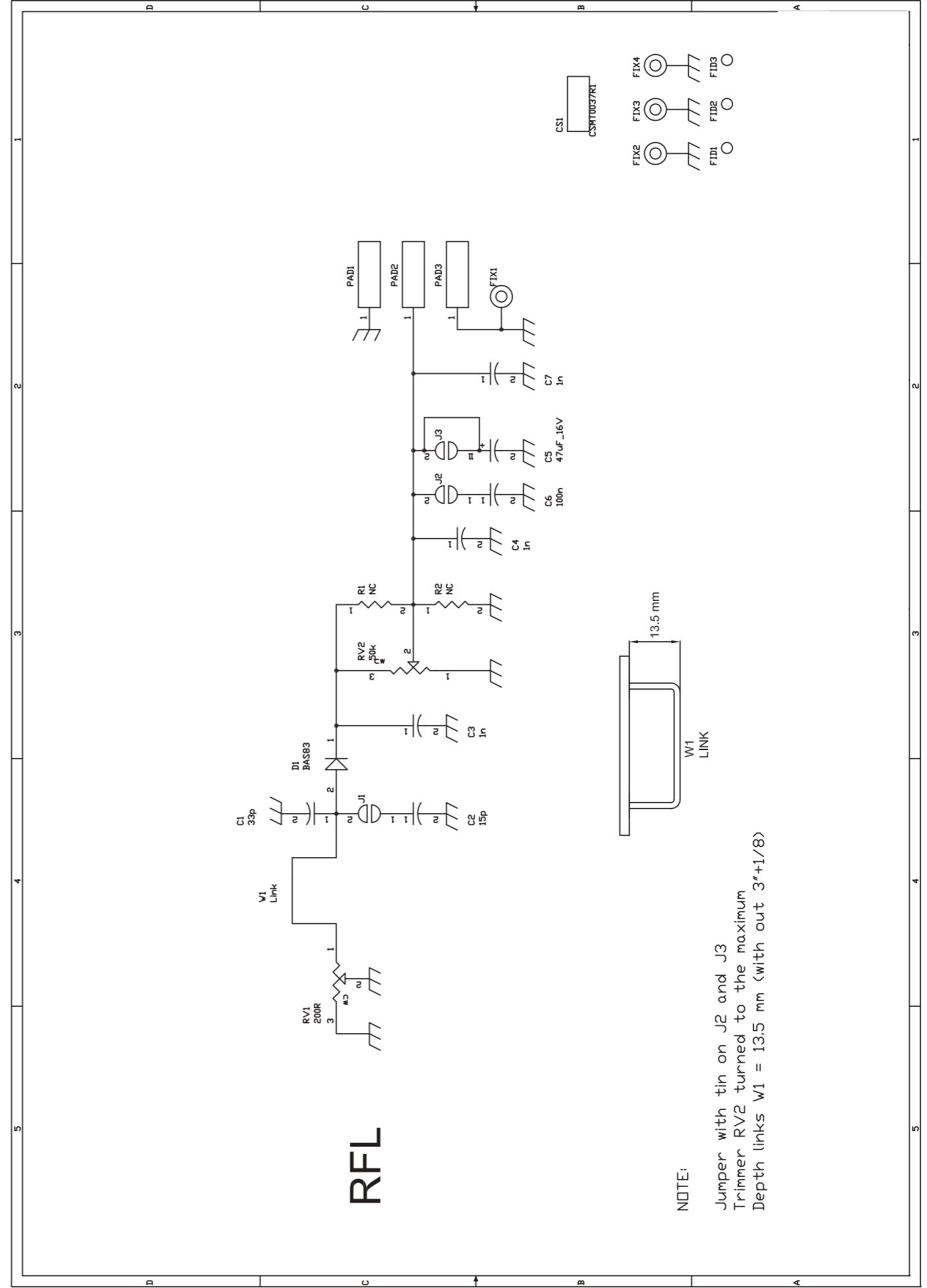
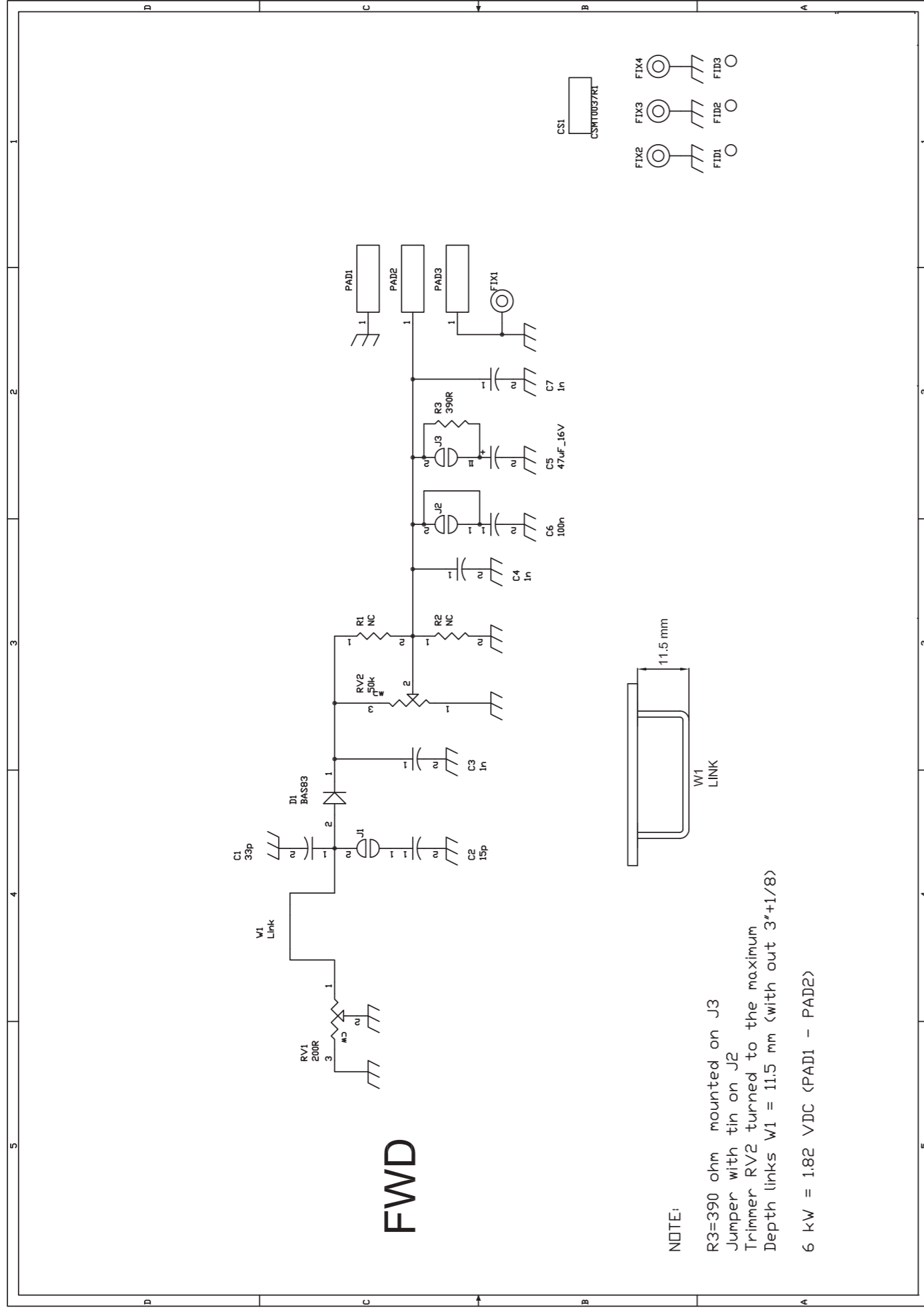
RFL

See diagram on the following pages

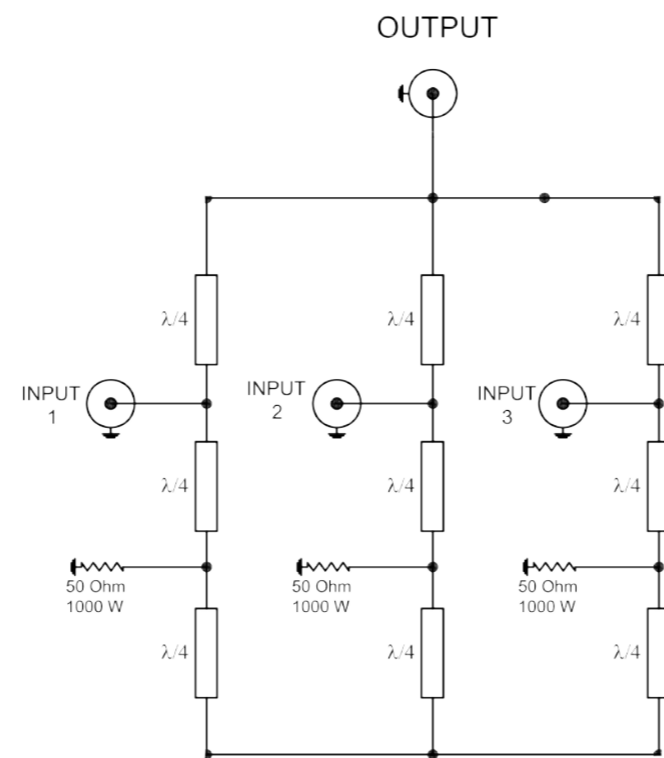
RF Power measure board PJ10KPS-CA  
SL042MT1001  
Revision: 0.1  
Generic RF PWR Measurement  
042

16/02/2014

Item	Quantity	Reference	Part
1	1	CS1	CSMT0037R1
2	1	C1	33p
3	1	C2	15p
4	3	C3,C4,C7	1n
5	1	C5	47uF_16V
6	1	C6	100n
7	1	D1	BAS83
8	3	FID1,FID2,FID3	FID
9	4	FIX1,FIX2,FIX3,FIX4	FIX35
10	3	J1,J2,J3	JSMD
11	3	PAD1,PAD2,PAD3	PAD
12	1	RV1	200R
13	1	RV2	50k
14	2	R1,R2	NC
15	1	W1	Link
16	1	R3	390R

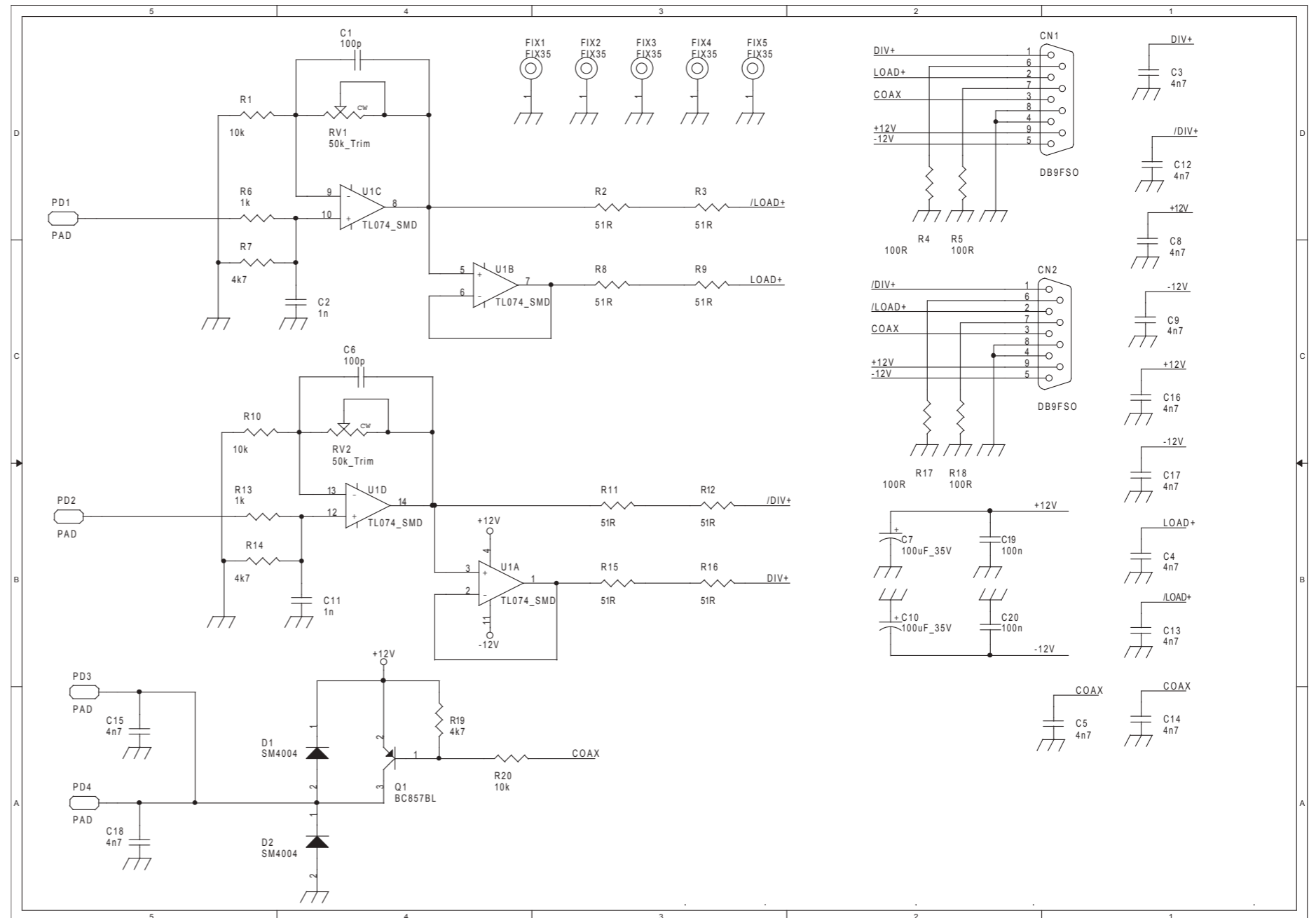
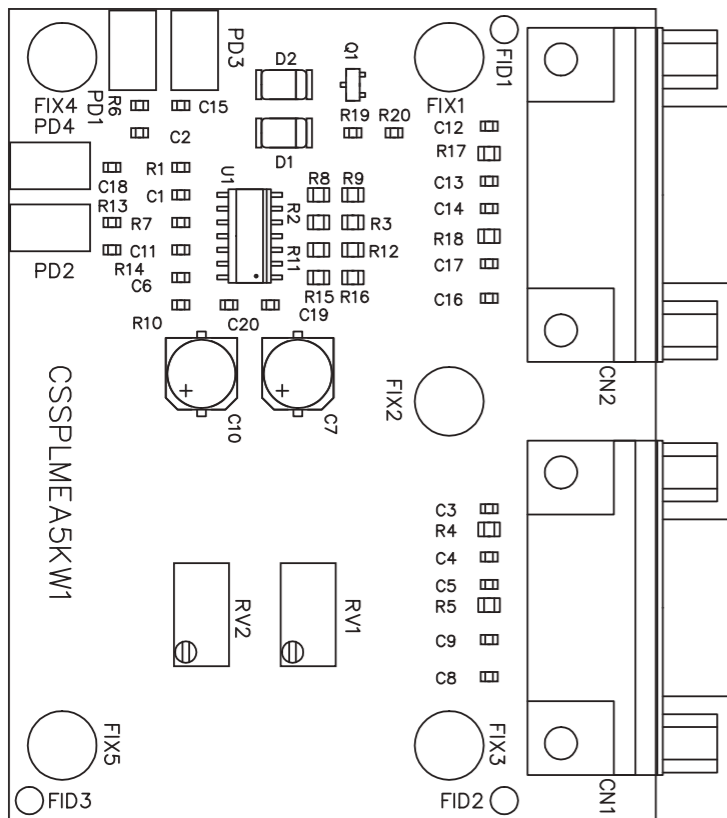


**Combiner (PF1HC510KWPJ-318)**



MODEL OF THE ELECTRIC SHEMATIC OF 3-WAY COMBINER

**Splitter - Card measures splitter (SLSPLEA5KW1)**

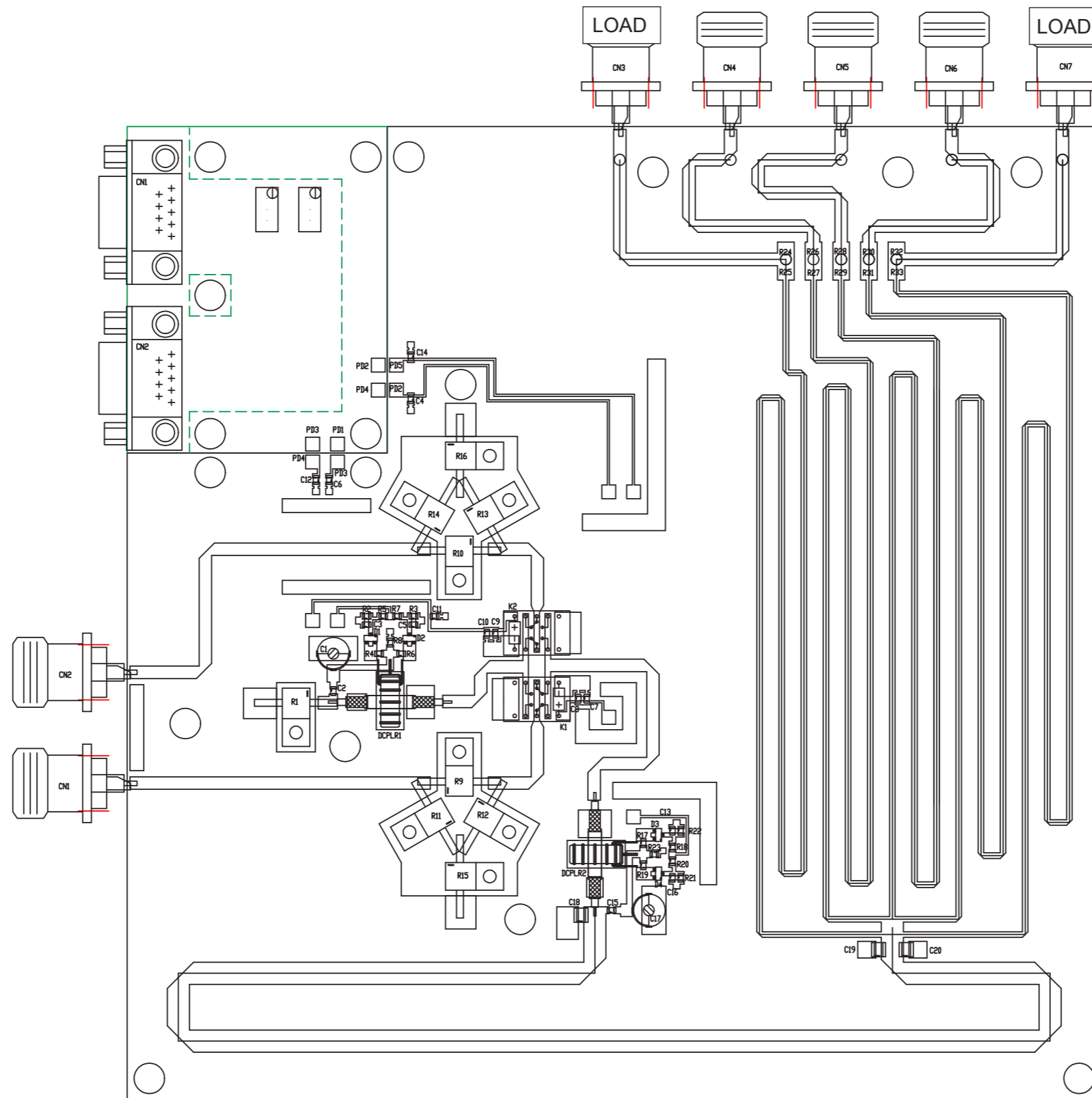


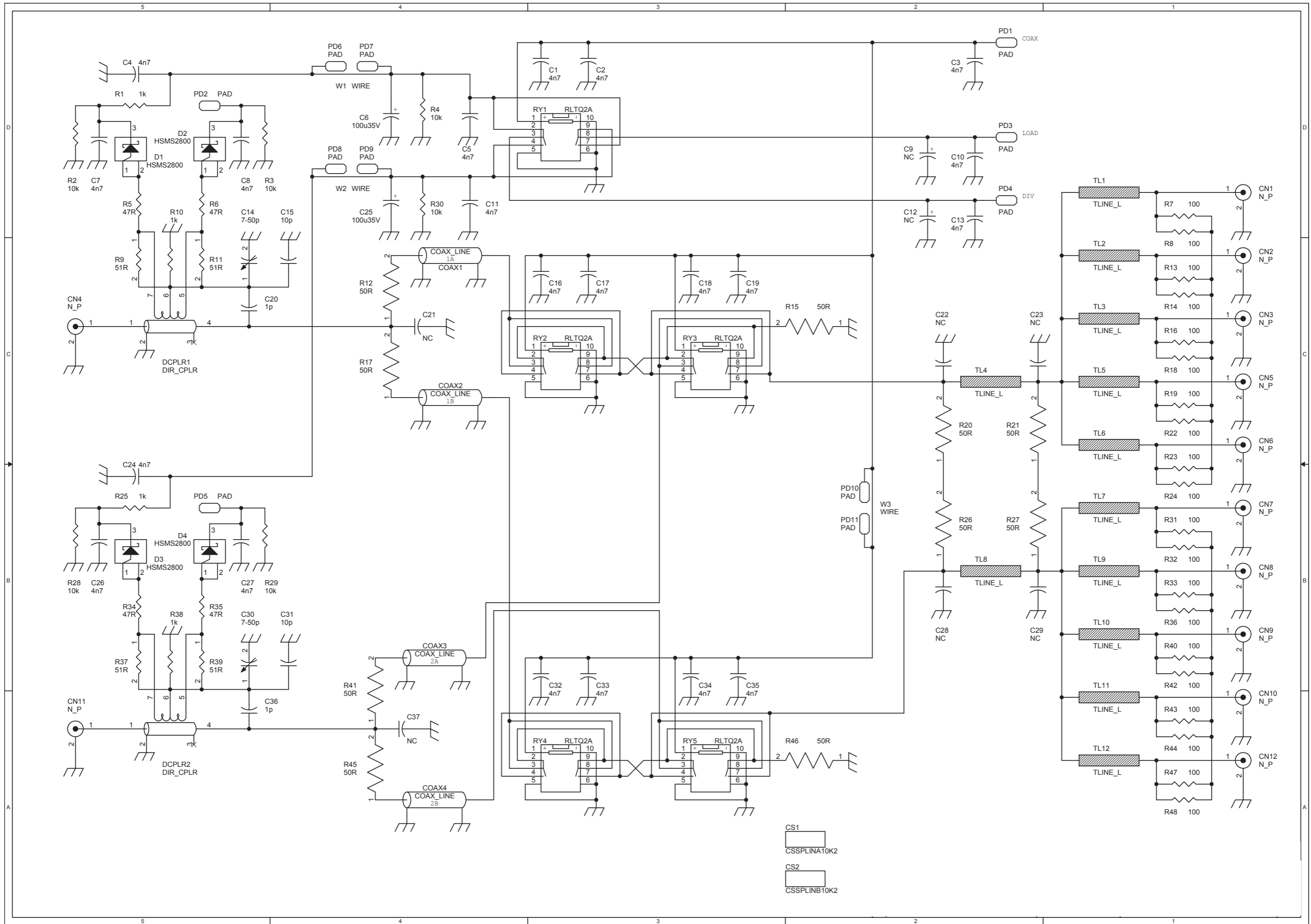
RF Input Splitter Measurement Revised: Friday, April 11, 2014  
 CSSPLMEA5KW1 Revision: 1.0  
 Mauro Ucelli  
 05/09/2001

Bill Of Materials Page1

Item	Quantity	Reference	Part
9	4	PD1,PD2,PD3,PD4	PAD
10	1	Q1	BC857BL
11	2	RV1,RV2	50k_Trim
12	3	R1,R10,R20	10k
13	8	R2,R3,R8,R9,R11,R12,R15, R16	51R
14	4	R4,R5,R17,R18	100R
15	2	R6,R13	1k
16	3	R7,R14,R19	4k7
17	1	U1	TL074_SMD
1	2	CN1,CN2	DB9F50
2	2	C1,C6	100p
3	2	C2,C11	1n
4	12	C3,C4,C5,C8,C9,C12,C13, C14,C15,C16,C17,C18	4n7
5	2	C7,C10	100uF_35V
6	2	C19,C20	100n
7	2	D1,D2	SM4004
8	5	FIX1,FIX2,FIX3,FIX4,FIX5	FIX35

Splitter - input splitter (SLSPLINP5KW1)



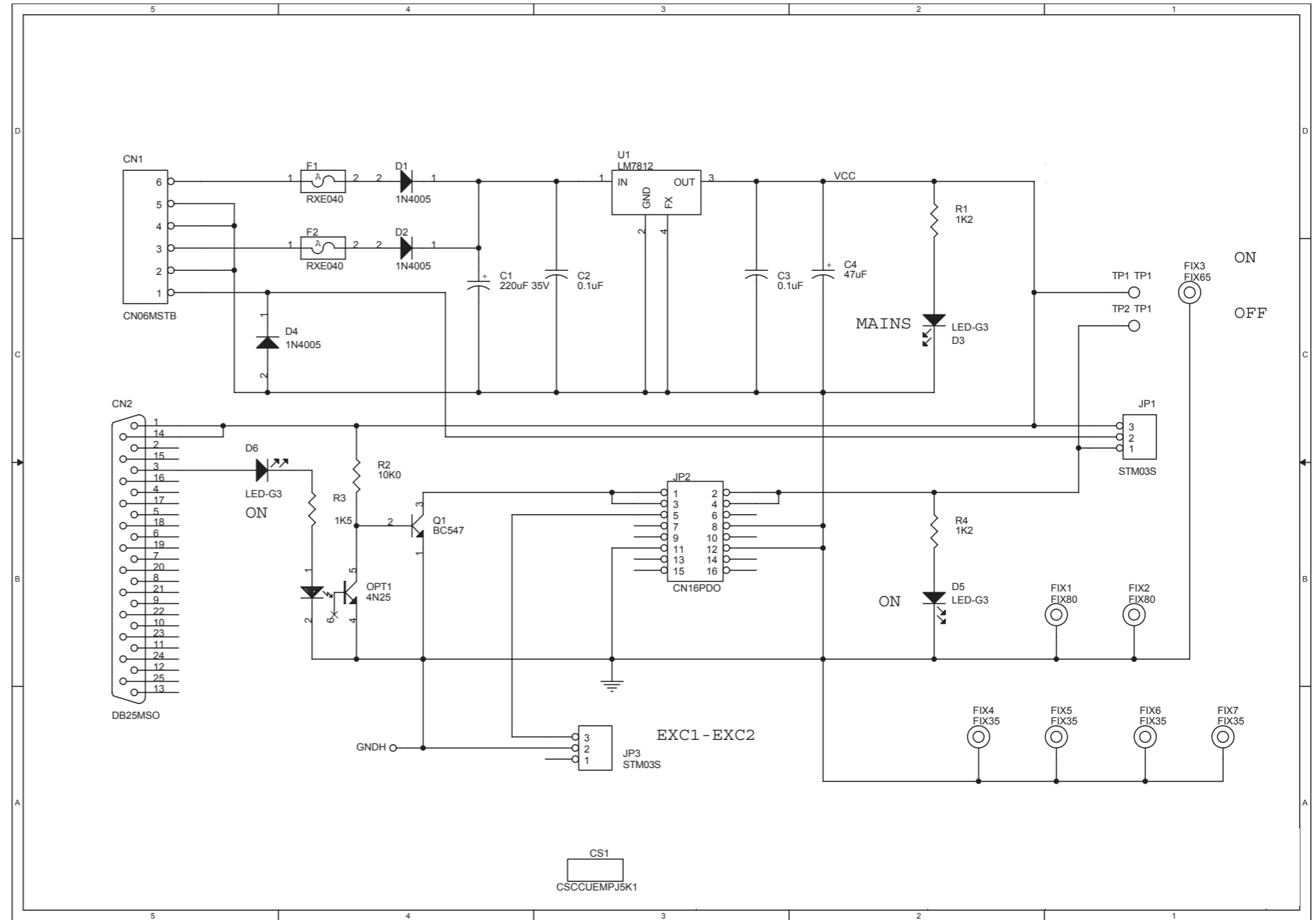
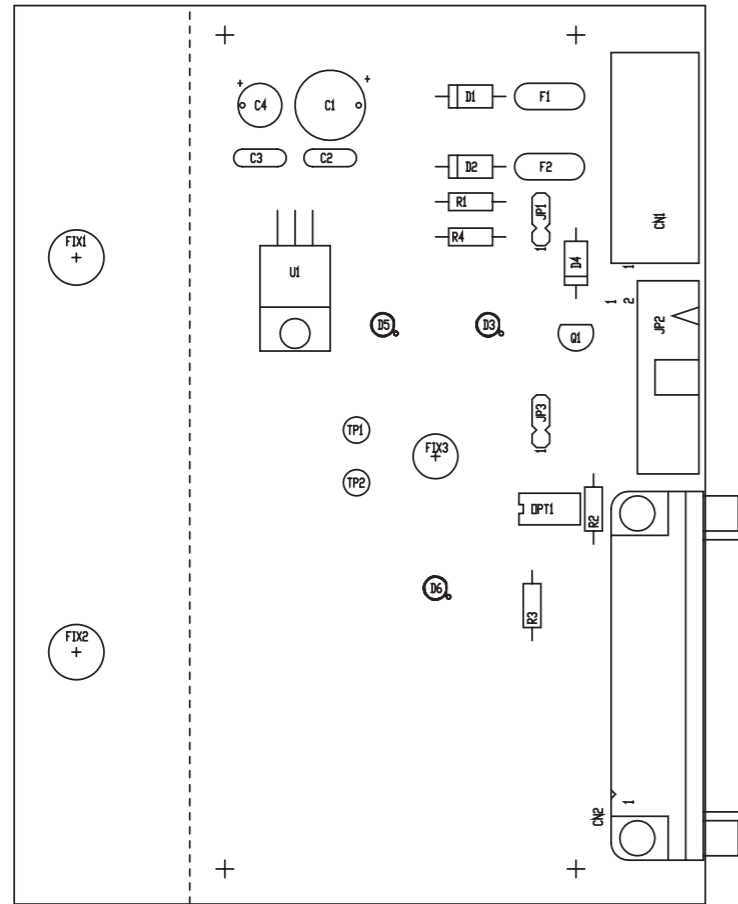




10 Ways Splitter  
 SLSPLINP10K2  
 Revision: 1.0  
 PJ20KPS  
 Mauro Ucelli  
 04/01/2005

Item	Quantity	Reference	Part
1	12	CN1,CN2,CN3,CN4,CN5,CN6, CN7,CN8,CN9,CN10,CN11, CN12	N_P
2	4	COAX1,COAX2,COAX3,COAX4	COAX_LINE
3	1	CS1	CSSPLINA10K2
4	1	CS2	CSSPLINB10K2
5	21	C1,C2,C3,C4,C5,C7,C8,C10, C11,C13,C16,C17,C18,C19, C24,C26,C27,C32,C33,C34, C35	4n7
6	2	C25,C6	100u35V
7	2	C9,C12	NC
8	2	C14,C30	7-50p
9	2	C31,C15	10p
10	2	C36,C20	1p
11	6	C21,C22,C23,C28,C29,C37	NC
12	2	DCPLR1,DCPLR2	DIR_CPLR
13	4	D1,D2,D3,D4	HSMS2800
14	11	PD1,PD2,PD3,PD4,PD5,PD6, PD7,PD8,PD9,PD10,PD11	PAD
15	5	RY1,RY2,RY3,RY4,RY5	RLTQ2A
16	4	R1,R10,R25,R38	1k
17	6	R2,R3,R4,R28,R29,R30	10k
18	4	R5,R6,R34,R35	47R
19	20	R7,R8,R13,R14,R16,R18, R19,R22,R23,R24,R31,R32, R33,R36,R40,R42,R43,R44, R47,R48	100
20	4	R9,R11,R37,R39	51R
21	10	R12,R15,R17,R20,R21,R26, R27,R41,R45,R46	50R
22	12	TL1,TL2,TL3,TL4,TL5,TL6, TL7,TL8,TL9,TL10,TL11, TL12	TLINE_L
23	3	W1,W2,W3	WIRE

**Emergency CCU Board (SLCCUEMPJ5K1)**



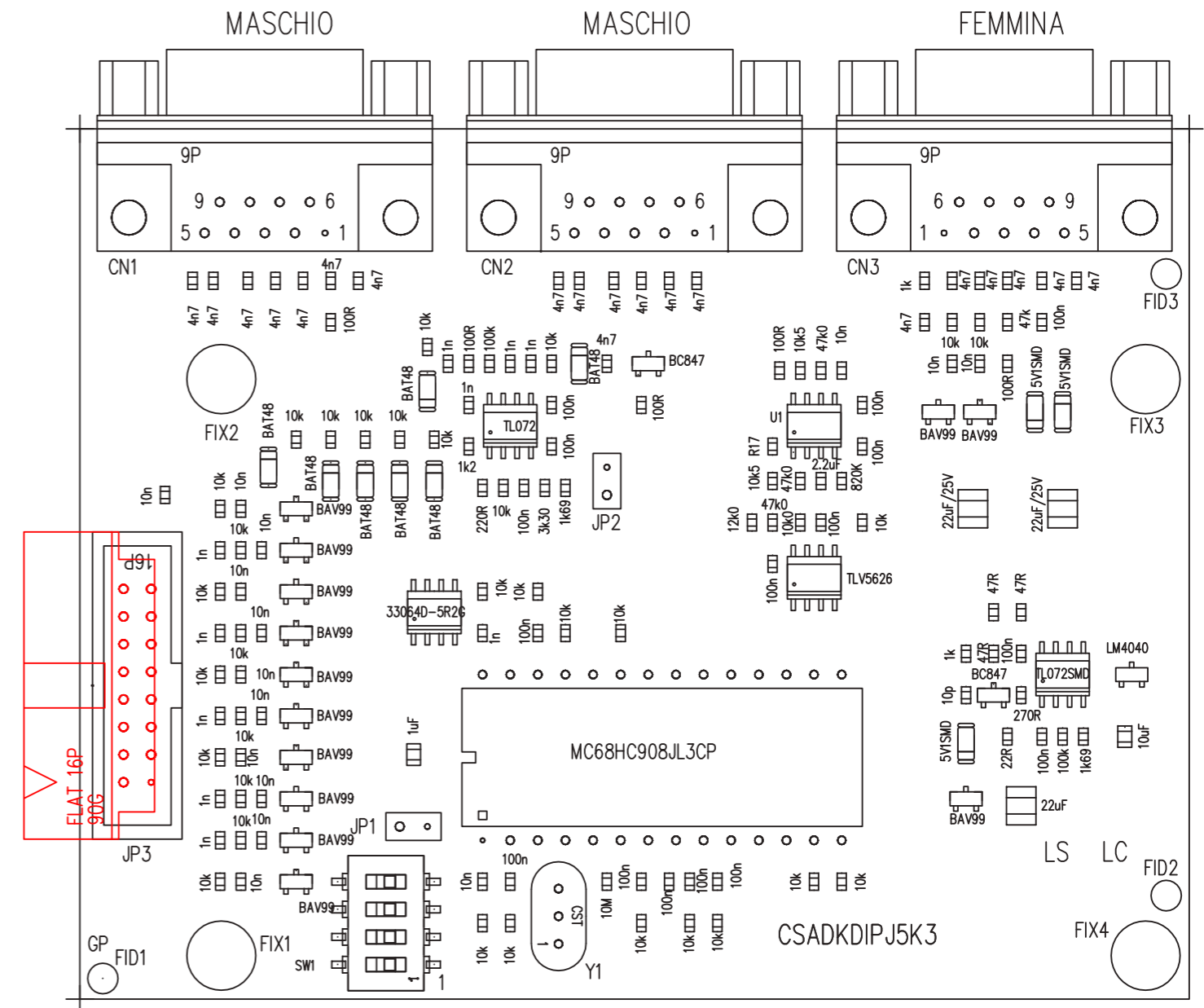
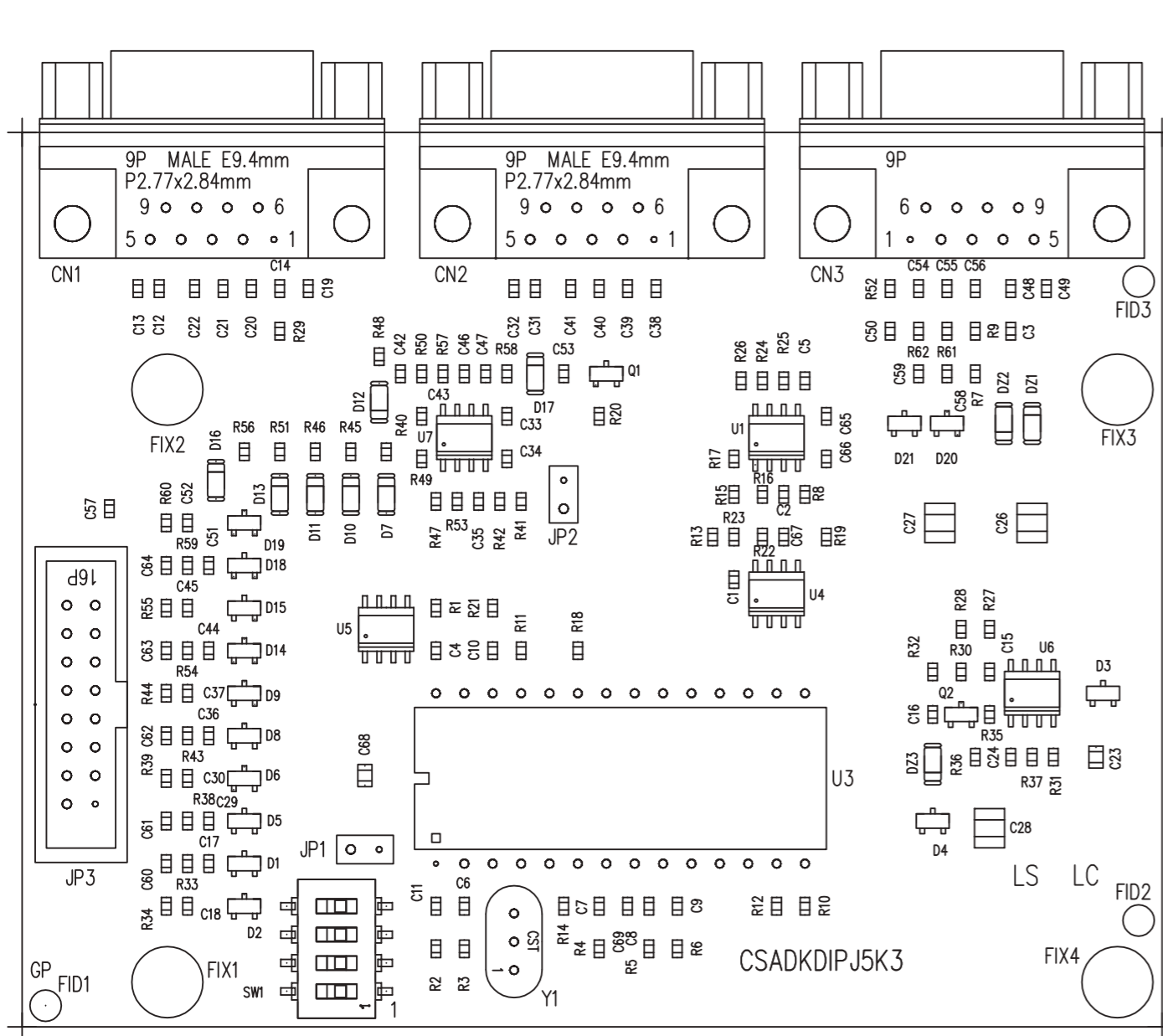
SLCCUEMPJ5K1 Revision: 1

Andrea Tommasi / Griptech

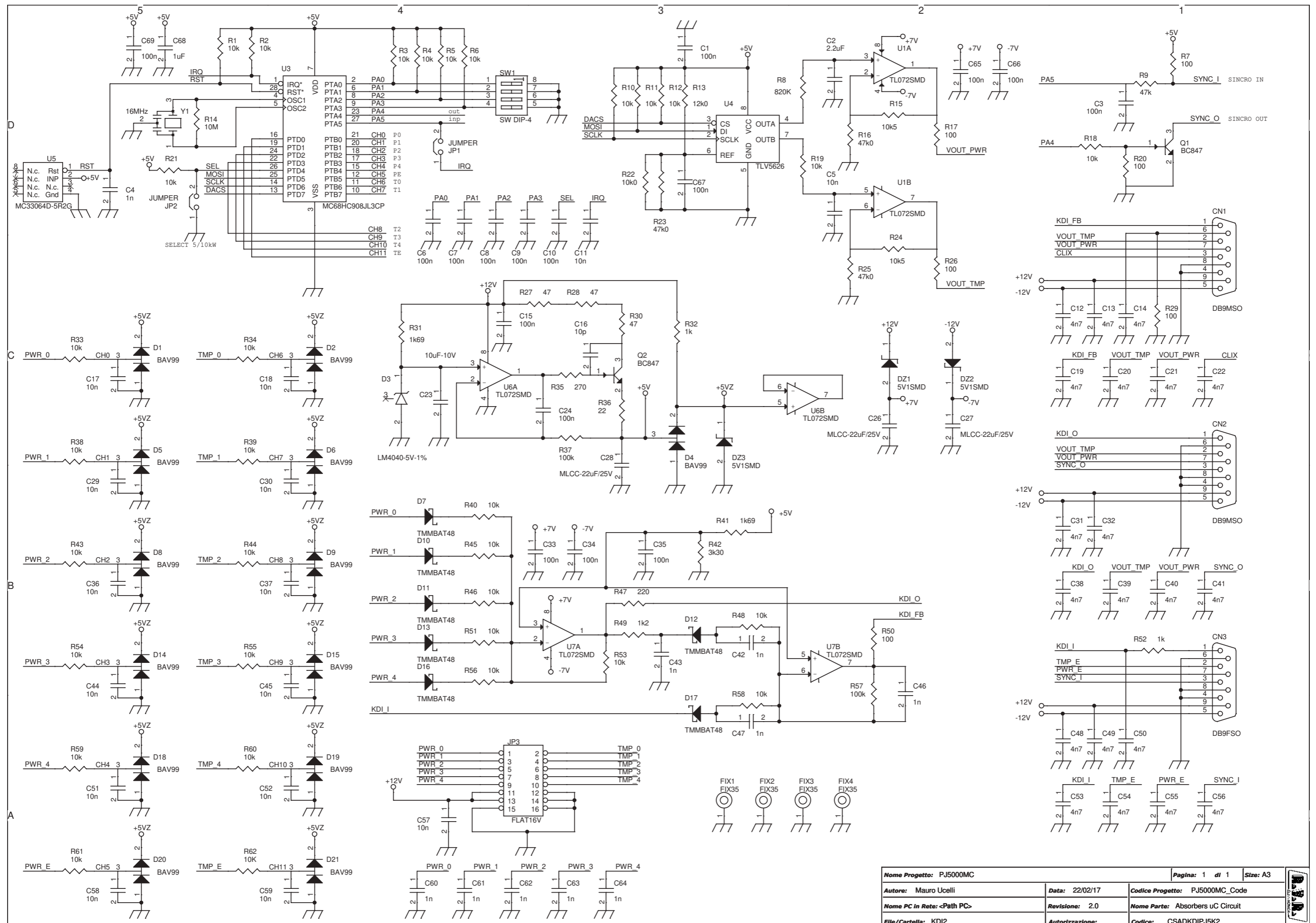
Item Quantity Reference Part

1	1	CN1	CN06MSTB	13	2	JP1,JP3	STM03S
2	1	CN2	DB25MSO	14	1	JP2	CN16PDO
3	1	CS1	CSCCUEMPJ5K1	15	1	OPT1	4N25
4	1	C1	220uF 35V	16	1	Q1	BC547
5	2	C2,C3	0.1uF	17	2	R4,R1	1K2
6	1	C4	47uF	18	1	R2	10K0
7	3	D1,D2,D4	1N4005	19	1	R3	1K5
8	3	D3,D5,D6	LED-G3	20	2	TP1,TP2	NC
9	2	FIX1,FIX2	FIX80	21	1	U1	LM7812
10	1	FIX3	FIX65	22	1	SW1	SW1V2P
11	4	FIX4,FIX5,FIX6,FIX7	FIX35				
12	2	F1,F2	RXE040				

Absorber measure board (SLADKDIPK5K3)



ARCHIVIO: X:\WORKDWG\	
TITLE PIANO DI MONTAGGIO CSADPPSPJ5K3	
DOCUMENT NUMBER CSADPPSPJ5K3_MNT. DWG	REV 3
DATE: 21 LUGLIO 2017	



Nome Progetto: PJ5000MC	Data: 22/02/17	Codice Progetto: PJ5000MC_Code	Pagina: 1 di 1	Size: A3
Autore: Mauro Ucelli	Revisione: 2.0	Nome Parte: Absorbors uC Circuit		
Nome PC in Rete: <Path PC>	Autorizzazione:	Codice: CSADKDPJ5K2		
File/Cartella: KDI2				

Absorbers uC Circuit Revised: Friday, July 21, 2017  
 CSADKDIPJ5K2 Revision: 2.0

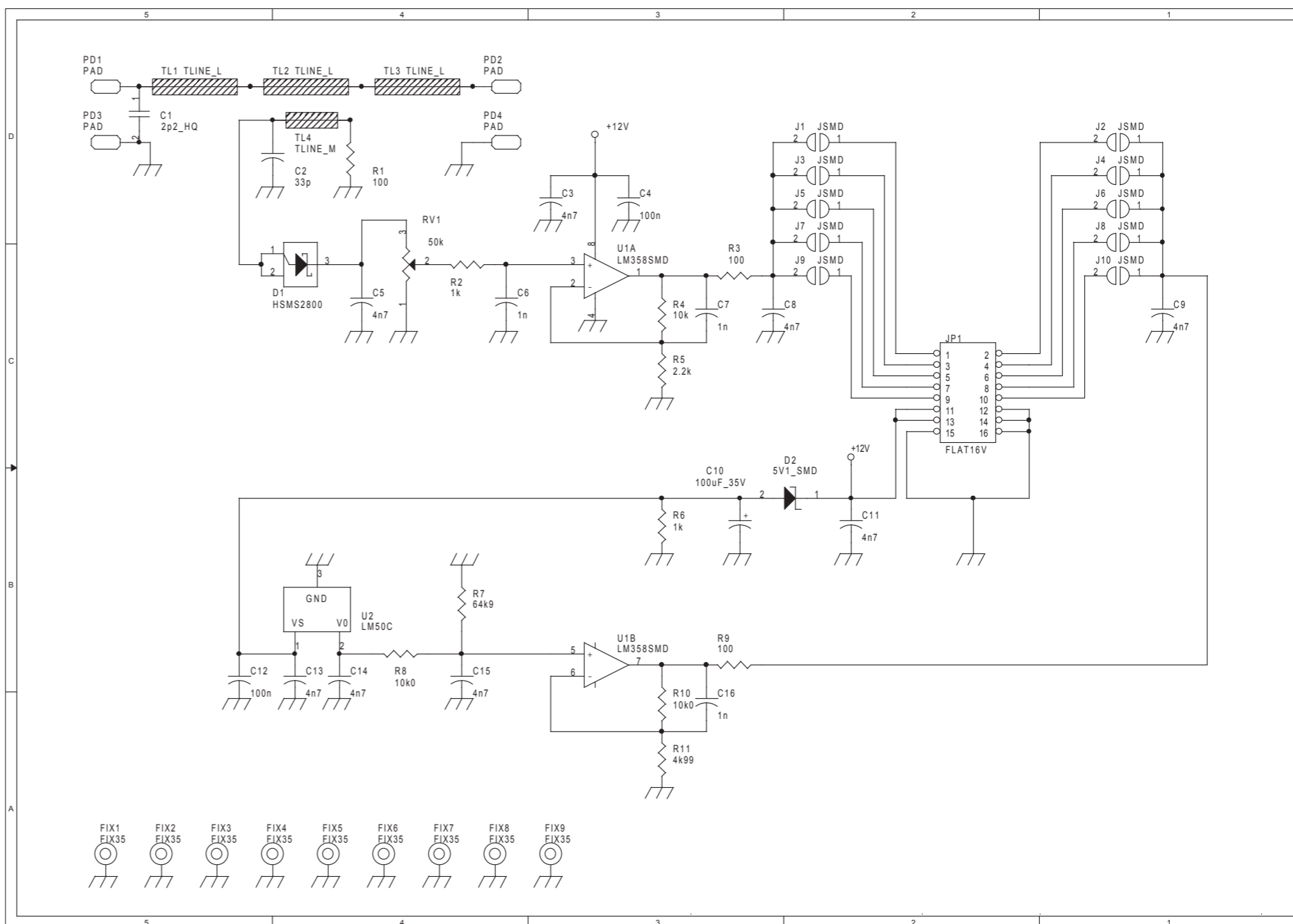
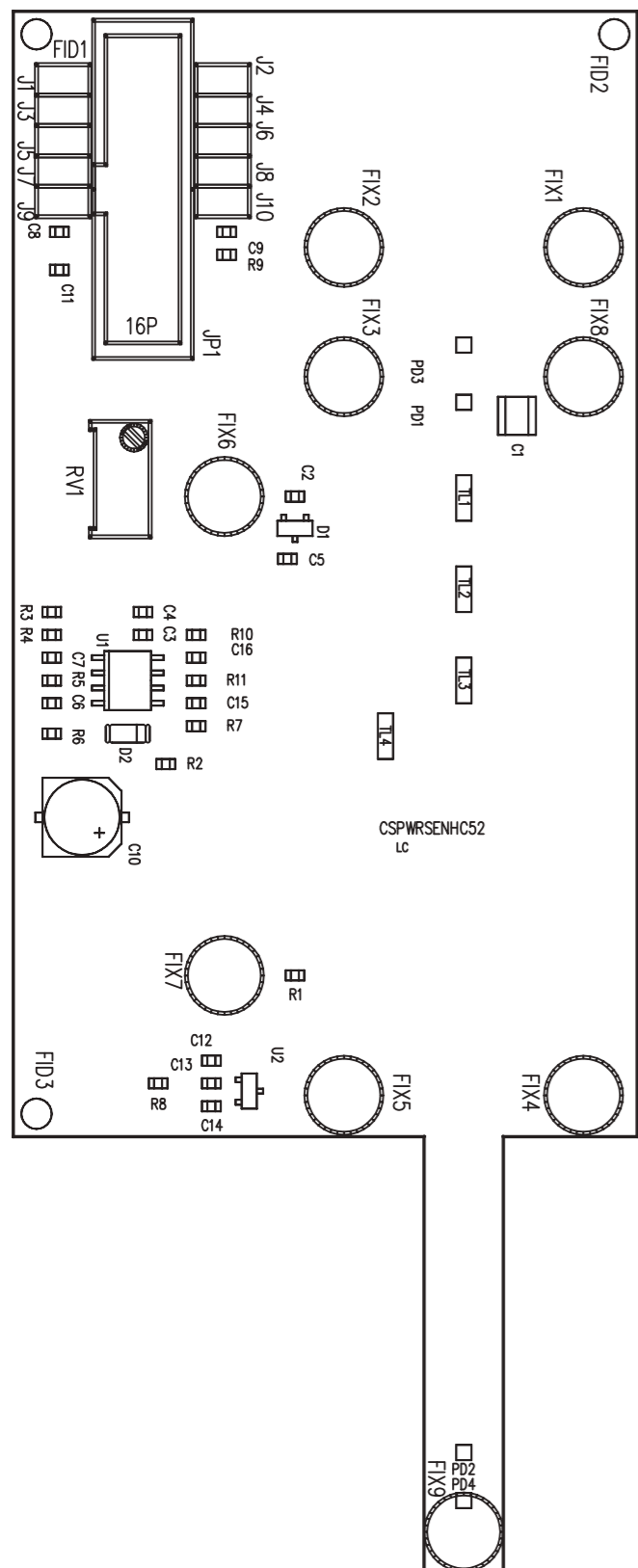
PJ5000MC  
 PJ5000MC\_Code  
 KDI2  
 Mauro Ucelli  
 22/02/17

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Item	Quantity	Reference	Part
1	2	CN1,CN2	DB9MSO
2	1	CN3	DB9FSO
3	16	C1,C3,C6,C7,C8,C9,C10, C15,C24,C33,C34,C35,C65, C66,C67,C69	100n
4	1	C2	2.2uF
5	10	C4,C42,C43,C46,C47,C60, C61,C62,C63,C64	1n
6	15	C5,C11,C17,C18,C29,C30, C36,C37,C44,C45,C51,C52, C57,C58,C59	10n
7	20	C12,C13,C14,C19,C20,C21, C22,C31,C32,C38,C39,C40, C41,C48,C49,C50,C53,C54, C55,C56	4n7
8	1	C16	10p
9	1	C23	10uF-10V
10	3	C26,C27,C28	MLCC-22uF/25V
11	1	C68	1uF
12	3	DZ1,DZ2,DZ3	5V1SMD
13	13	D1,D2,D4,D5,D6,D8,D9,D14, D15,D18,D19,D20,D21	BAV99
14	1	D3	LM4040-5V-1%
15	7	D7,D10,D11,D12,D13,D16, D17	TMMBAT48
16	4	FIX1,FIX2,FIX3,FIX4	FIX35
17	2	JP1,JP2	JUMPER
18	1	JP3	FLAT16V
19	2	Q1,Q2	BC847
20	32	R1,R2,R3,R4,R5,R6,R10, R11,R12,R18,R19,R21,R33, R34,R38,R39,R40,R43,R44, R45,R46,R48,R51,R53,R54, R55,R56,R58,R59,R60,R61, R62	10k
21	6	R7,R17,R20,R26,R29,R50	100
22	1	R8	820K
23	1	R9	47k
24	1	R13	12k0
25	1	R14	10M
26	2	R15,R24	10k5
27	3	R16,R23,R25	47k0
28	1	R22	10k0

29	3	R27,R28,R30	47
30	2	R31,R41	1k69
31	2	R32,R52	1k
32	1	R35	270
33	1	R36	22
34	2	R37,R57	100k
35	1	R42	3k30
36	1	R47	220
37	1	R49	1k2
38	1	SW1	SW DIP-4
39	3	U1,U6,U7	TL072SMD
40	1	U3	MC68HC908JL3CP
41	1	U4	TLV5626
42	1	U5	MC33064D-5R2G
43	1	Y1	16MHz

**Unbalancement measure board (SLPWRSEBHC52)**

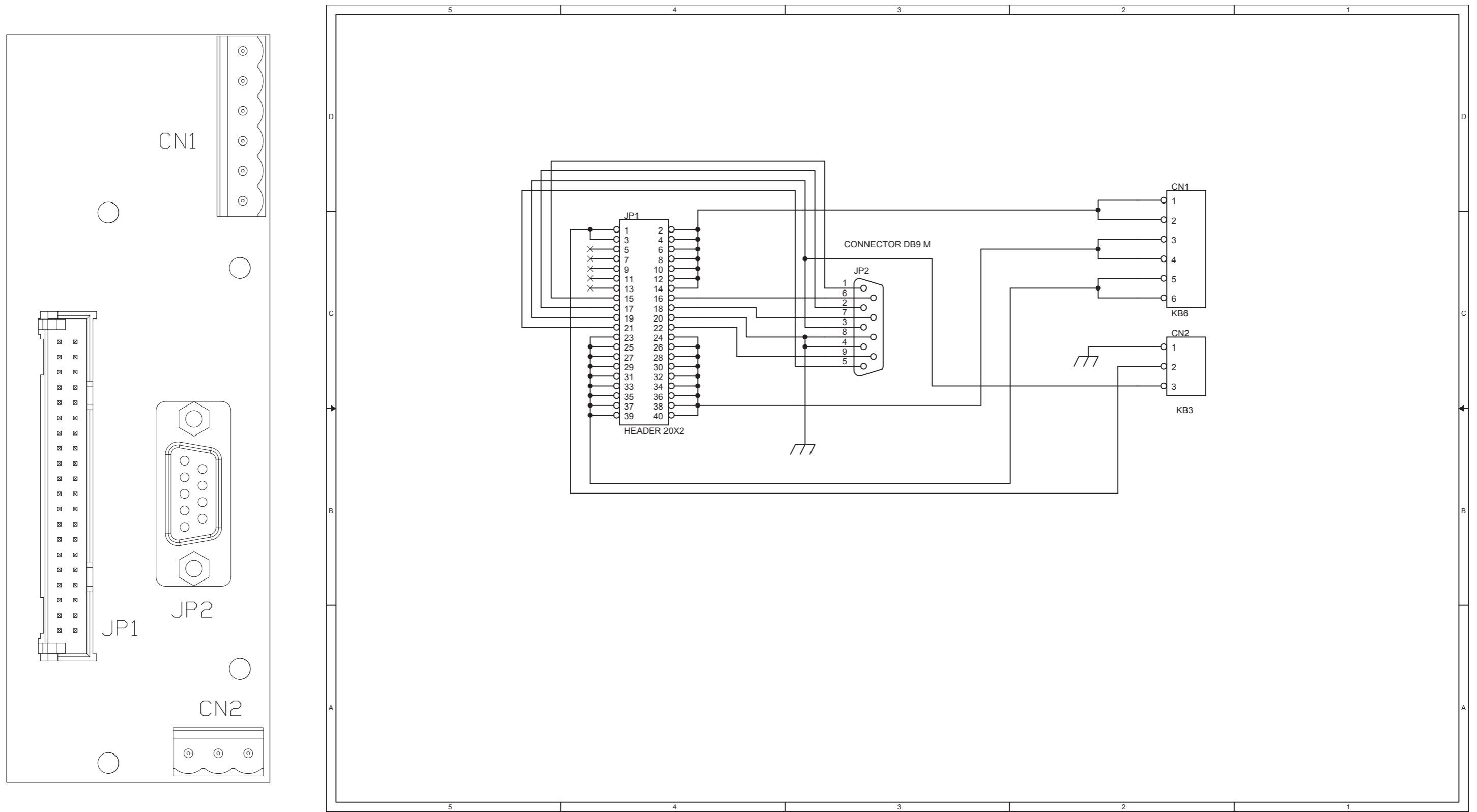


Absorber Measure Circuit Revised: Friday, April 11, 2014  
 CSPWRSEBHC52 Revision: 1.0  
 Mauro Ucelli  
 23/01/2002  
 Bill Of Materia Page1

Item	Quantity	Reference	Part
1	1	C1	2p2_HQ
2	1	C2	33p
3	8	C3,C5,C8,C9,C11,C13,C14	4n7
		C15	
4	2	C4,C12	100n
5	3	C6,C7,C16	1n
6	1	C10	100uF_35V
7	1	D1	HSMS2800
8	1	D2	5V1_SMD

9	9	FIX1, FIX2, FIX3, FIX4, FIX5, FIX6, FIX7, FIX8, FIX9	FIX35
10	1	JP1	FLAT16V
11	10	J1, J2, J3, J4, J5, J6, J7, J8, J9, J10	JSMD
12	4	PD1, PD2, PD3, PD4	PAD
13	1	RV1	50k
14	3	R1, R3, R9	100
15	2	R2, R6	1k
16	1	R4	10k
17	1	R5	2.2k
18	1	R7	64k9
19	2	R8, R10	10k0
20	1	R11	4k99
21	3	TL1, TL2, TL3	TLINE_L
22	1	TL4	TLINE_M
23	1	U1	LM358SMD
24	1	U2	LM50C

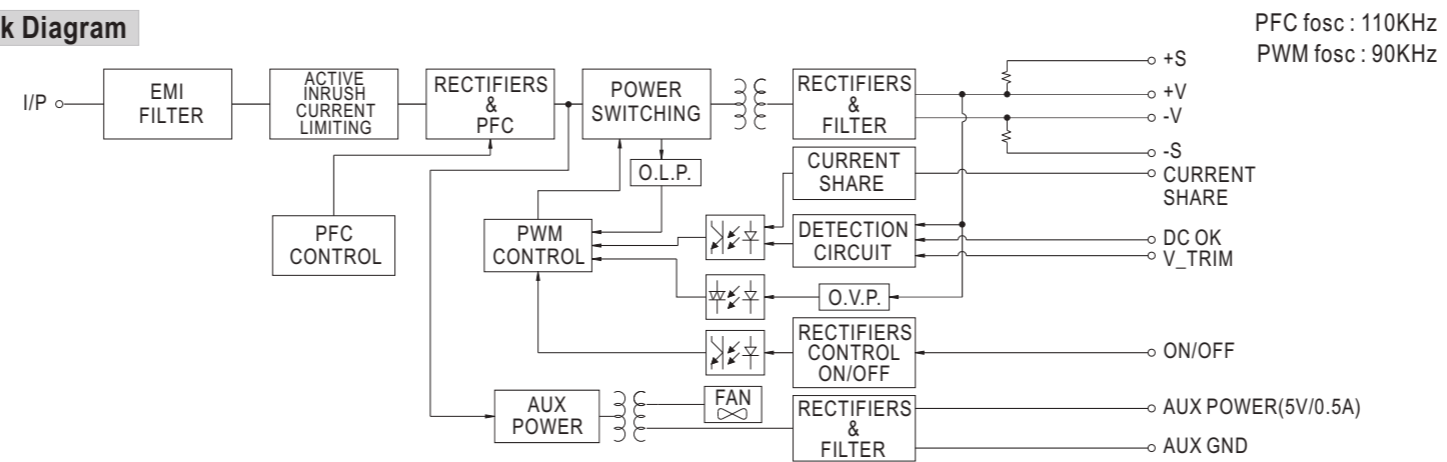
**Dummy load interface (SLIORFPJ6KCV)**



Switching power supply



■ Block Diagram





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