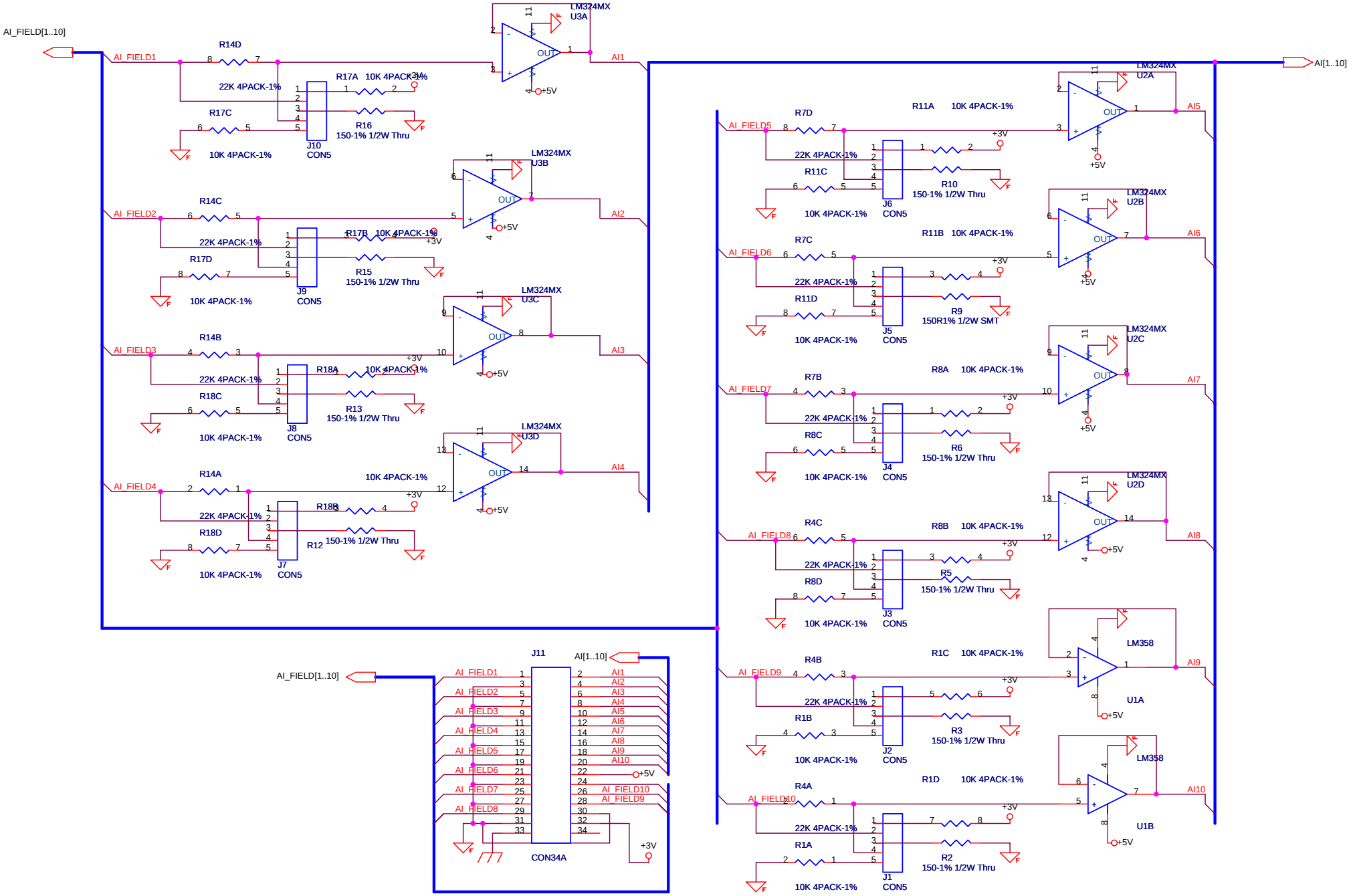
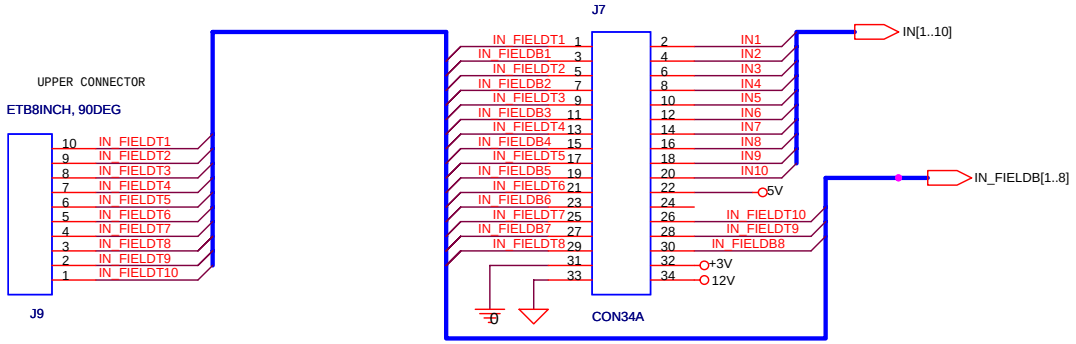
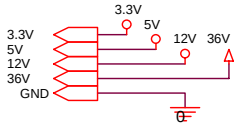
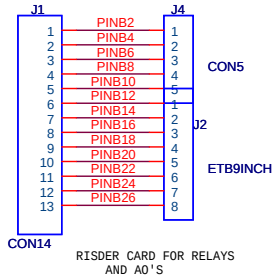
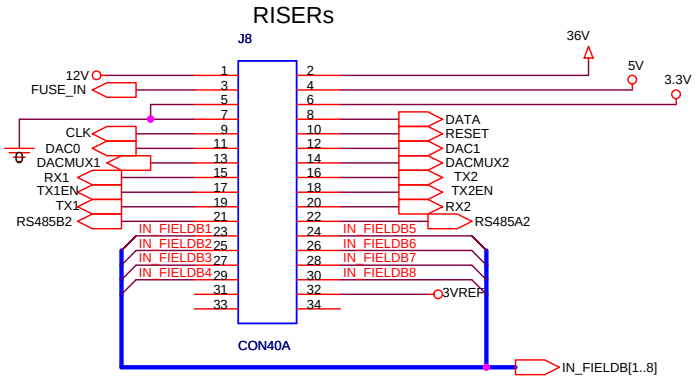
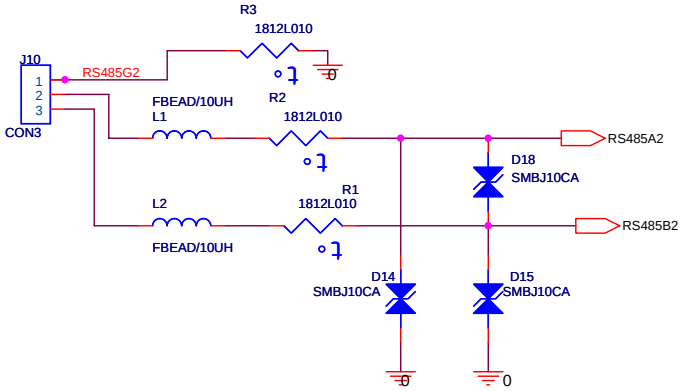

AI_FIELD[1..10]
AI[1..10]
LM324MX
U3A
U3B
U3C
U3D
U2A
U2B
U2C
U2D
LM358
U1A
U1B
R14D
R17A 10K 4PACK-1%
R17C
22K 4PACK-1%
10K 4PACK-1%
R16
150-1% 1/2W Thru
J10
CON5
R14C
R17B 10K 4PACK-1%
R17D
R15
J9
R14B
R18A 10K 4PACK-1%
R18C
R13
J8
R14A
R18B 10K 4PACK-1%
R18D
R12
J7
R7D
R11A 10K 4PACK-1%
R11C
R10
J6
R7C
R11B 10K 4PACK-1%
R11D
R9
150R1% 1/2W SMT
J5
R7B
R8A 10K 4PACK-1%
R8C
R6
J4
R4C
R8B 10K 4PACK-1%
R8D
R5
J3
R4B
R1C 10K 4PACK-1%
R1B
R3
J2
R4A
R1D 10K 4PACK-1%
R1A
R2
J1
J11
CON34A
+3V
+5V

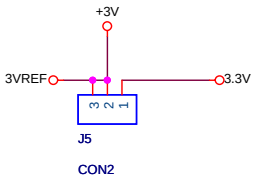

UPPER CONNECTOR
ETB8INCH, 90DEG
J9
J7
CON34A
IN[1..10]
IN_FIELDB[1..8]
5V
+3V
12V

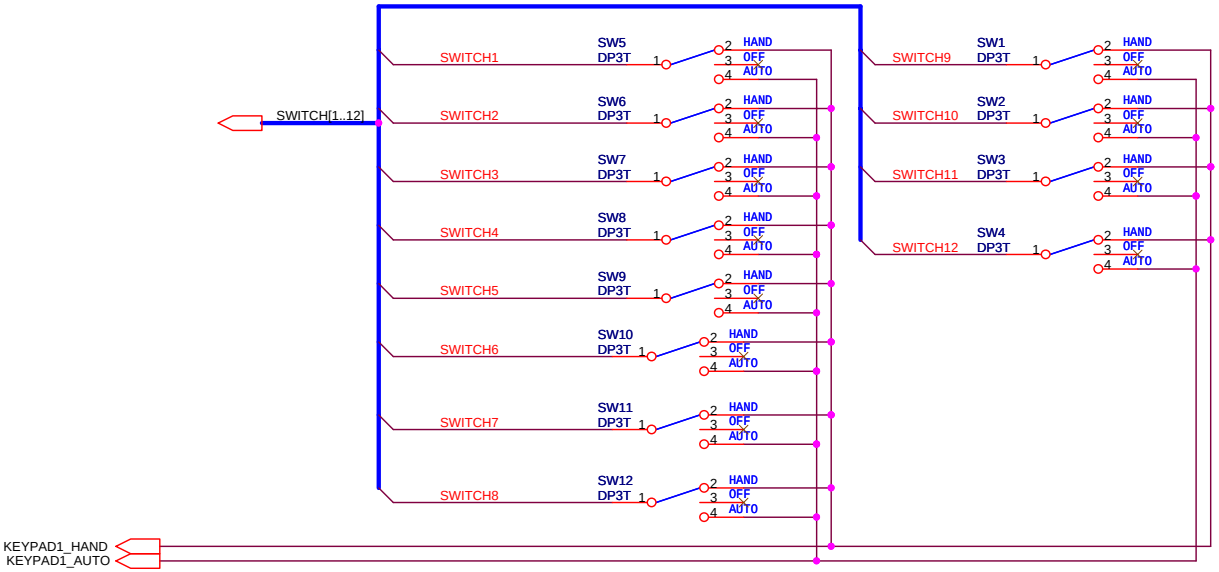

3.3V
5V
12V
36V
GND

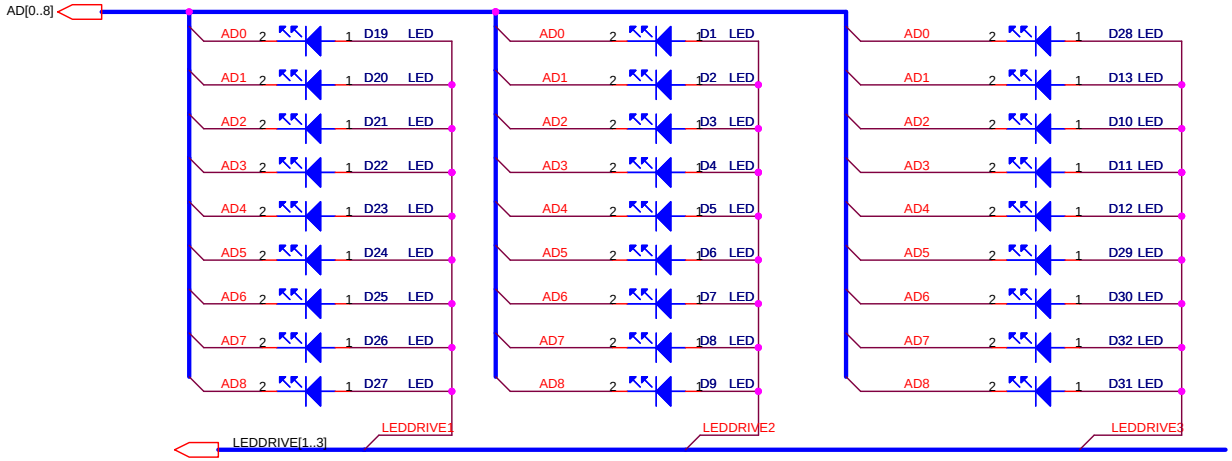

J1
J4
CON5
J2
ETB9INCH
CON14
RISDER CARD FOR RELAYS
AND AO'S

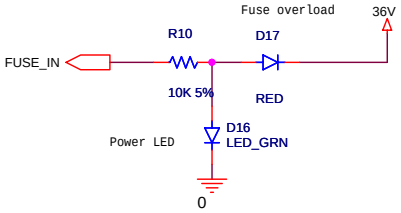

RISERs
J8
CON40A
12V
FUSE_IN
CLK
DAC0
DACMUX1
RX1
TX1EN
TX1
RS485B2
DATA
RESET
DAC1
DACMUX2
TX2
TX2EN
RX2
RS485A2
3VREF
36V
5V
3.3V
IN_FIELDB[1..8]

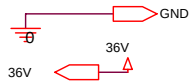

R3
1812L010
J10
CON3
RS485G2
FBEAD/10UH
L1
R2
1812L010
R1
1812L010
L2
FBEAD/10UH
RS485A2
RS485B2
D18
SMBJ10CA
D14
SMBJ10CA
D15
SMBJ10CA


+3V
3VREF
3.3V
J5
CON2





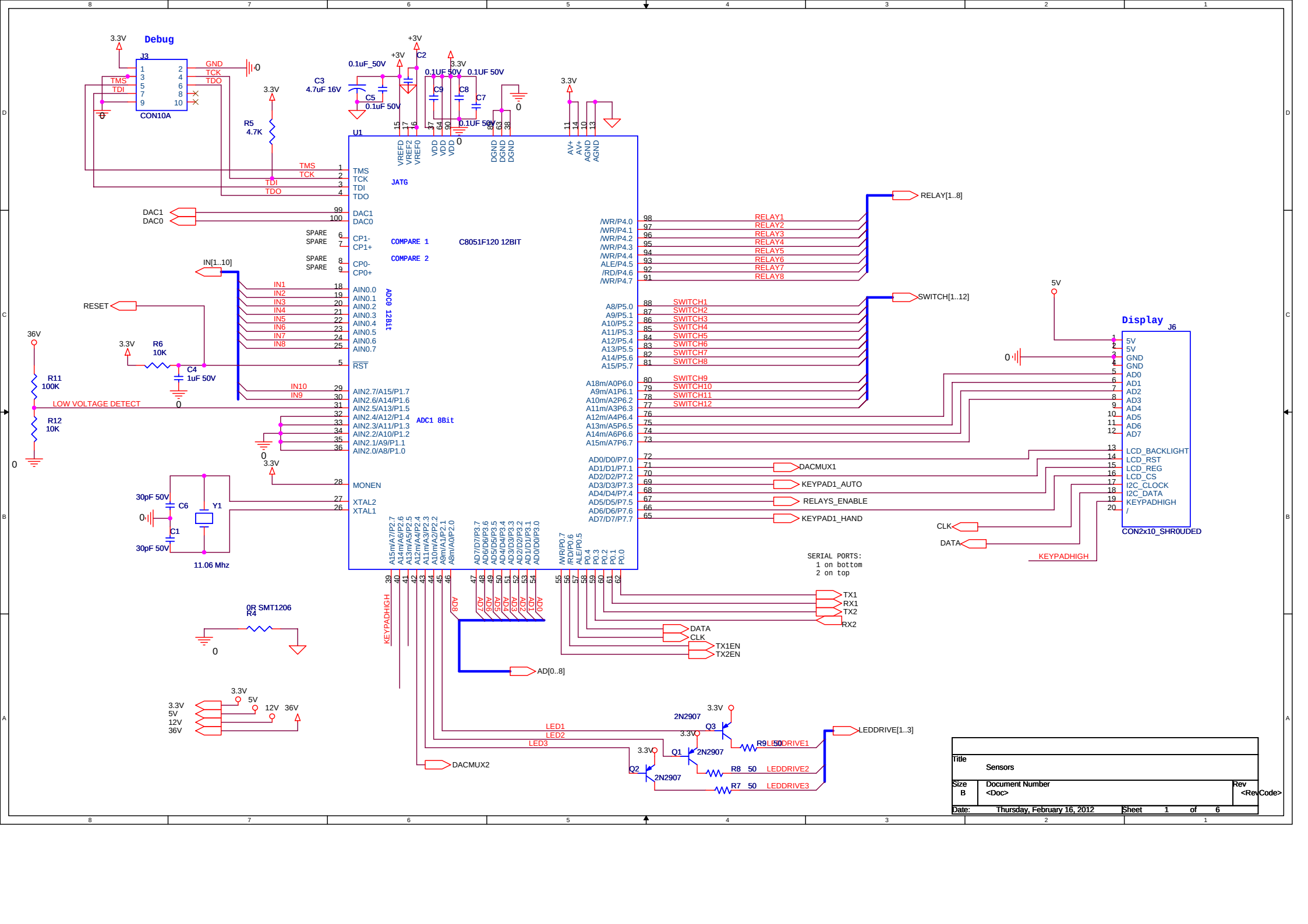


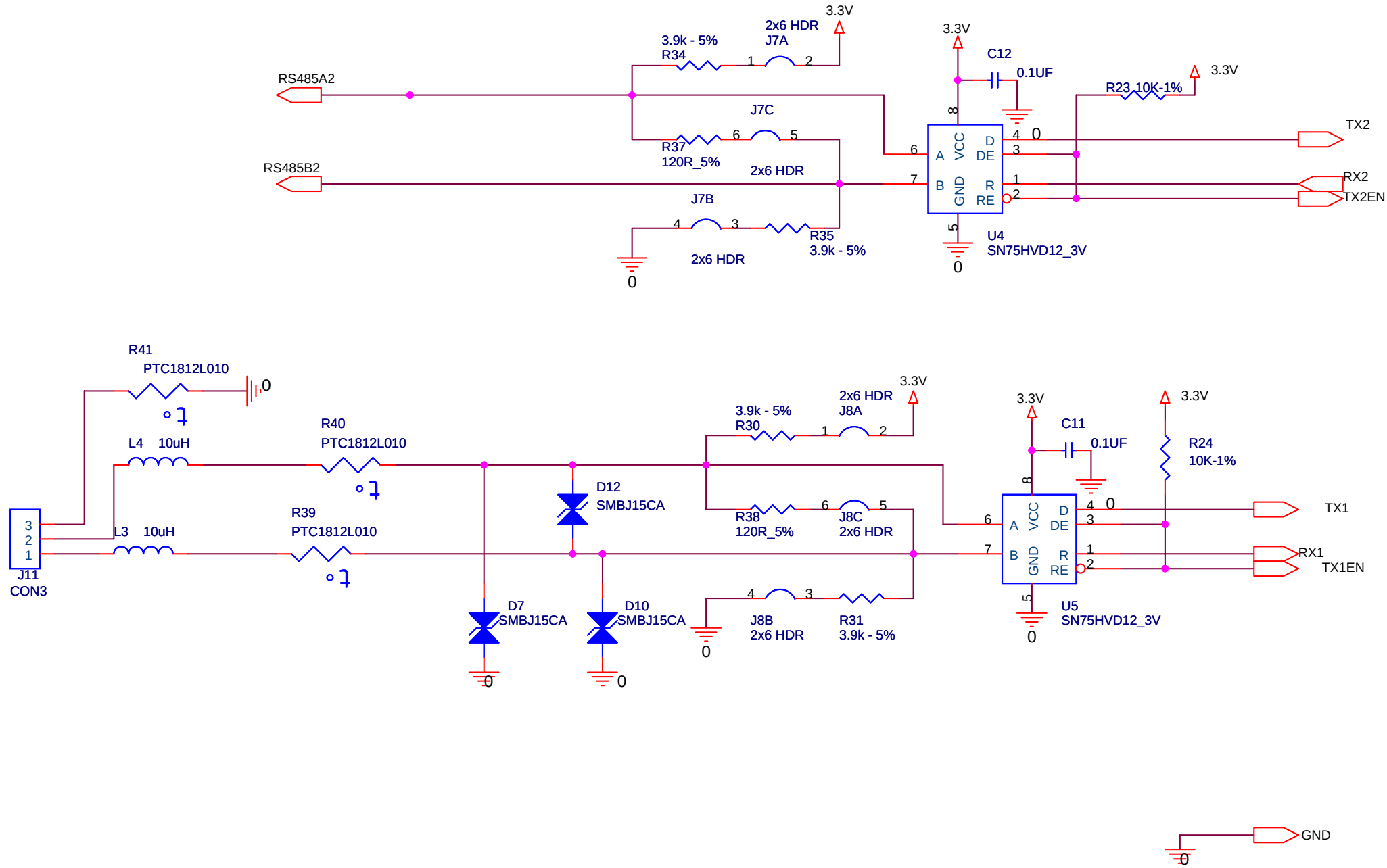


Fuse blown LED

LED CARD

	TEMCO CONTROLS LTD. 1027 WEST 7TH AVE VANCOUVER BC, V6H 1B2 TEL: (604) 438 - 8294 FAX: (604) 438 - 9313
	T3000 OUTPUT CARD
Size: B	CAGE Code: <Cage Code>
DWG NO	Rev: 03
Monday, September 19, 2011	Scale
Sheet: 3 of 6	


Debug
J3
CON10A
C3
4.7uF 16V
C5
0.1uF 50V
C2
0.1uF_50V
C9
C8
C7
0.1UF 50V
R5
4.7K
U1
JATG
COMPARE 1
COMPARE 2
C8051F120 12BIT
ADC0 12BIT
ADC1 8Bit
RELAY[1..8]
SWITCH[1..12]
Display
J6
CON2x10_SHR0UDED
R6
10K
C4
1uF 50V
R11
100K
R12
10K
LOW VOLTAGE DETECT
RESET
IN[1..10]
C6
C1
30pF 50V
Y1
11.06 Mhz
R4
0R SMT1206
DACMUX1
KEYPADHIGH
KEYPADHIGH
DACMUX2
AD[0..8]
SERIAL PORTS:
1 on bottom
2 on top
TX1
RX1
TX2
RX2
DATA
CLK
TX1EN
TX2EN
LED1
LED2
LED3
LEDDRIVE[1..3]
2N2907
Q1
Q2
Q3
R9 50 LEDDRIVE1
R8 50 LEDDRIVE2
R7 50 LEDDRIVE3
Title
Sensors
Size
B
Document Number
<Doc>
Rev
<RevCode>
Date:
Thursday, February 16, 2012
Sheet
1
of
6


RS485A2
RS485B2
3.9k - 5%
R34
2x6 HDR
J7A
3.3V
J7C
R37
120R_5%
2x6 HDR
J7B
R35
3.9k - 5%
2x6 HDR
C12
0.1UF
R23 10K-1%
U4
SN75HVD12_3V
TX2
RX2
TX2EN
R41
PTC1812L010
L4 10uH
R40
PTC1812L010
L3 10uH
R39
PTC1812L010
J11
CON3
D12
SMBJ15CA
D7
SMBJ15CA
D10
SMBJ15CA
3.9k - 5%
R30
2x6 HDR
J8A
R38
120R_5%
J8C
2x6 HDR
J8B
2x6 HDR
R31
3.9k - 5%
C11
0.1UF
R24
10K-1%
U5
SN75HVD12_3V
TX1
RX1
TX1EN
GND

DONE: USE A/D FOR ANALOG OUTPUT FEEDBACK

TBD: FIX PART NUMBER
N4100CHS5DC5C

K4 K8 K3 K7 K2 K6 K1 K5
N4100CH S 5A DC5VDC0.2W

MOV8 MOV7 MOV6 MOV5 MOV4 MOV3 MOV2 MOV1
SMBJ170CA

OUT1 OUT2 OUT3 OUT4 OUT5 OUT6 OUT7 OUT8

PINB15 PINB16 PINB13 PINB14 PINB11 PINB12 PINB9 PINB10 PINB7 PINB8 PINB5 PINB6 PINB3 PINB4 PINB1 PINB2

PINB[1..8]

RELAY[1..8]
RELAY1 RELAY2 RELAY3 RELAY4 RELAY5 RELAY6 RELAY7 RELAY8

INPUTS LOWER
J9
ETB8INCH, 90DEG
IN_FIELDB1 IN_FIELDB2 IN_FIELDB3 IN_FIELDB4 IN_FIELDB5 IN_FIELDB6 IN_FIELDB7 IN_FIELDB8
INFIELDB[1..8]

Lower Connector
J3
ETB8INCH, 90DEG
PINB1 PINB3 PINB5 PINB7 PINB9 PINB11 PINB13 PINB15

J1
SPARE
GNDS FOR AOS
ETBSINCH, 90DEG

RISERs
J6
SIP16x2
12V FUSE_IN E2CLOCK DAC0 DACMUX1 RX1 TX1EN TX1 RS485B2
36V 5V 3.3V
E2DATA RESET DAC1 DACMUX2 TX2 TX2EN RX2 RS485A2
IN_FIELDB1 IN_FIELDB2 IN_FIELDB3 IN_FIELDB4 IN_FIELDB5 IN_FIELDB6 IN_FIELDB7 IN_FIELDB8
3VREF
IN_FIELDB[1..8]

Riser to upper terminal block
J2
CON14
AO1 AO2 AO3 AO4
PINB2 PINB4 PINB6 PINB8 PINB10 PINB12 PINB14 PINB16

AOS
DAC0 DAC1 DACMUX1 DACMUX2
AO_FEEDBACK[1..4]
AO[1..4]
DAC_EN
ANALOG_OUT

3.3V 5V 12V 36V GND

C2 0.1UF

U1
PIC16F722AT-I/SS
28SS0P
12f882

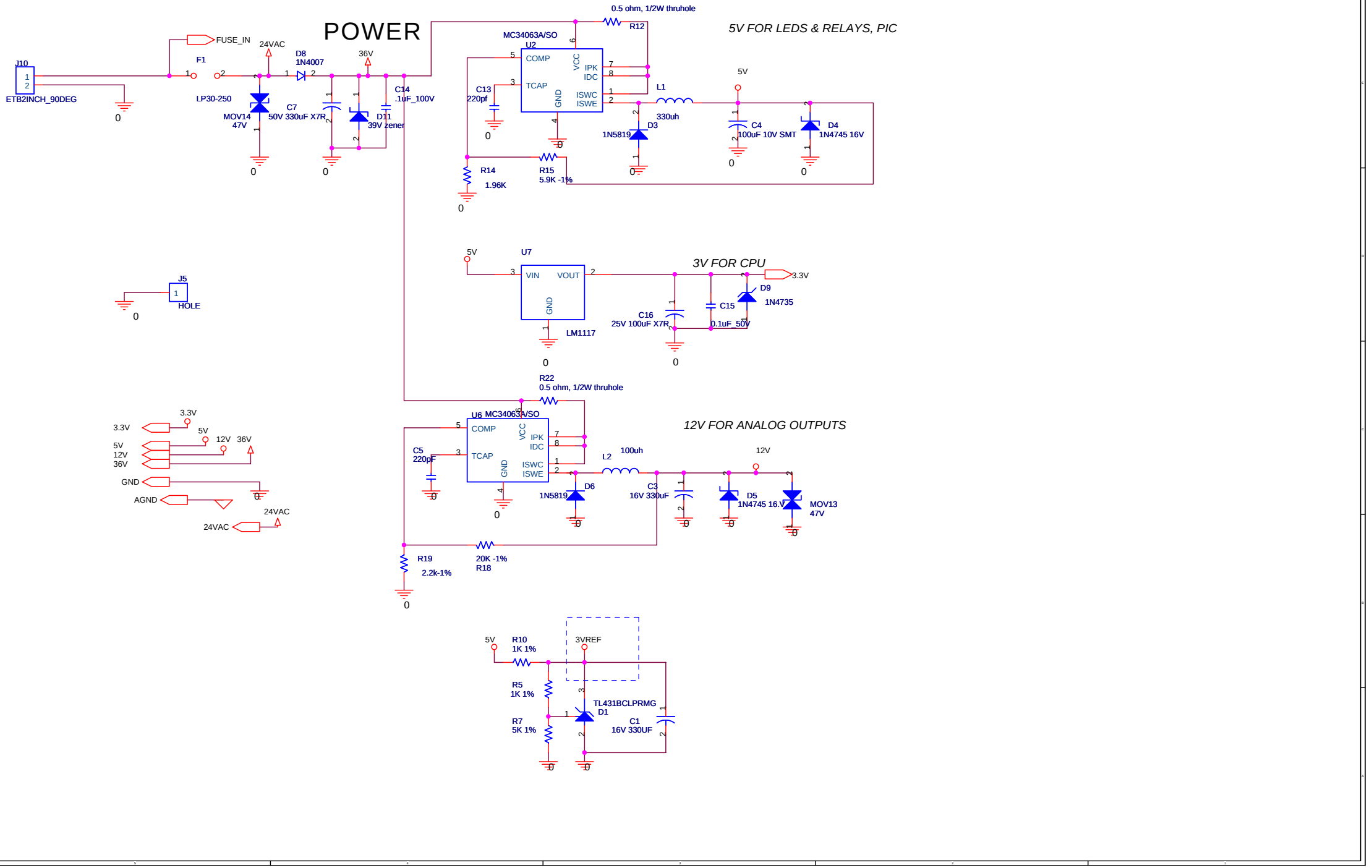
AO_FEEDBACK1 AO_FEEDBACK2 AO_FEEDBACK3 5VREF_SPARE RELAY8 AO_FEEDBACK4
RA0/AN0 RA1/AN1 RA2/AN2/ RA3/AN3/VREF+ RA4/T0CKI RA5/SS/AN4
RC0/T1OSO/T1CKI RC1/T1OSI/CCP2 RC2/CCP1 RC3/SCK/SCL RC4/SDI/SDA RC5/SDO RC6/TX/CK RC7/RX/DT
RA6/OSC2/CLKOUT
RELAY1 RELAY2 RELAY3 E2CLOCK RELAY4 RELAY5 RELAY6 RELAY7

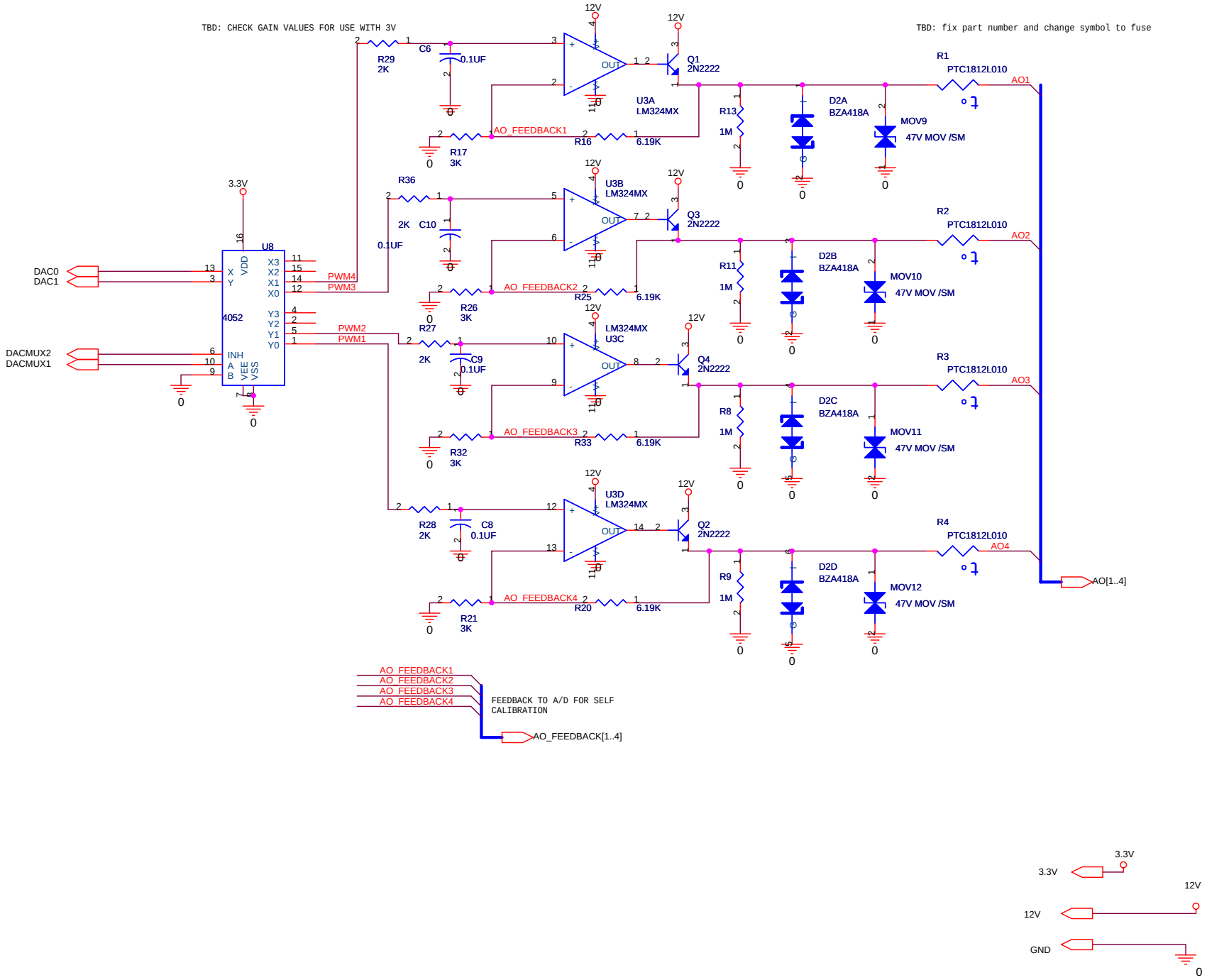
RTD IN7_SPARE IN5_SPARE IN6_SPARE
RB0/INT/AN12 RB1/AN10 RB2/AN8 RB3/AN9 RB4/AN11 RB5/AN13 RB6/ISPCLK RB7/ISPDAT
E2DATA RESET

OSC1/CLKIN/RA7
MCLR/VPP/RE3

J4
SIMP5
ICSP_VPP ICSP_DATA ICSP_CLK
R6 2K

NOTE: USE TSTAT6 PIC CODE


POWER
J10
ETB2INCH_90DEG
FUSE_IN
F1
24VAC
LP30-250
MOV14
47V
D8
1N4007
C7
50V 330uF X7R
36V
D11
39V zener
C14
.1uF_100V
0.5 ohm, 1/2W thruhole
R12
MC34063A/SO
U2
COMP
TCAP
VCC
IPK
IDC
ISWC
ISWE
GND
C13
220pf
L1
330uh
D3
1N5819
5V FOR LEDS & RELAYS, PIC
5V
C4
100uF 10V SMT
D4
1N4745 16V
R14
1.96K
R15
5.9K -1%
J5
HOLE
U7
VIN
VOUT
LM1117
3V FOR CPU
3.3V
D9
1N4735
C16
25V 100uF X7R
C15
0.1uF_50V
R22
0.5 ohm, 1/2W thruhole
U6 MC34063A/SO
C5
220pF
L2
100uh
D6
1N5819
C3
16V 330uF
12V
D5
1N4745 16.V
MOV13
47V
12V FOR ANALOG OUTPUTS
R19
2.2k-1%
20K -1%
R18
AGND
GND
24VAC
R10
1K 1%
3VREF
R5
1K 1%
R7
5K 1%
TL431BCLPRMG
D1
C1
16V 330UF


TBD: CHECK GAIN VALUES FOR USE WITH 3V
TBD: fix part number and change symbol to fuse
12V
3.3V
U8
4052
DAC0
DAC1
DACMUX2
DACMUX1
PWM4
PWM3
PWM2
PWM1
R29
2K
C6
0.1UF
U3A
LM324MX
Q1
2N2222
R1
PTC1812L010
AO1
R13
1M
D2A
BZA418A
MOV9
47V MOV /SM
AO_FEEDBACK1
R16
6.19K
R17
3K
R36
2K
C10
0.1UF
U3B
LM324MX
Q3
2N2222
R2
PTC1812L010
AO2
R11
1M
D2B
BZA418A
MOV10
47V MOV /SM
AO_FEEDBACK2
R25
6.19K
R26
3K
R27
2K
C9
0.1UF
U3C
LM324MX
Q4
2N2222
R3
PTC1812L010
AO3
R8
1M
D2C
BZA418A
MOV11
47V MOV /SM
AO_FEEDBACK3
R33
6.19K
R32
3K
R28
2K
C8
0.1UF
U3D
LM324MX
Q2
2N2222
R4
PTC1812L010
AO4
R9
1M
D2D
BZA418A
MOV12
47V MOV /SM
AO_FEEDBACK4
R20
6.19K
R21
3K
AO[1..4]
AO_FEEDBACK1
AO_FEEDBACK2
AO_FEEDBACK3
AO_FEEDBACK4
FEEDBACK TO A/D FOR SELF CALIBRATION
AO_FEEDBACK[1..4]
3.3V
12V
GND

T3-8IN-16OUT REV4

Done: remove pull-up and pull-down resistor on RS485 line

Done: fix BAS40 on RS485 line

Done: add PIC for high speed analog inputs

Done: no need for 12V supply, deleted

Done: added 16 relays, 5V

Done: add the Clear line on the Latches to reduce relay startup problems.

Done: add an RC on latches to reduce relay flicker on startup

Need to experiment with values

T3-8IN-13RELAY_REV0

TBD: add terminal for 12V aux output

Done: change to larger PIC for high speed inputs

Done: delete hand_off_auto_2 pins

Done: get rid of one latch, use CPU

Done: similar hardware connections as 8out type

Done: put header to the side of the board

Done: clean up board output

T3-8IN-13RELAY_REV01

DONE:Change the part NO of the mov1..mov13

TBD: fix the part no of the mcu chip

T3-8IN-13RELAY_REV05

TBD: add jumpers for aos

TBD: move aos to top board

TBD: delete some relays

TBD: check voltage of ao mux

TBD: ?? change the power chip to be lm2576 and delete 34063 chip

TBD: tie two inputs to comparators to use as high speed counters?

Done: change the relay outputs from TVS to MOV.

Done: protect inputs, use tvs, increase R's

Done: use Siliconix CPU now

Done: change the rs485 chip to opto module

Done: delete PIC, no need for ICD2 connection

Done: add the pic chip programming jumper (no pic now)

Done: 0-10V jumper not required, use programmable gain in cpu.

Done: delete the 78l05 chip on the bottom board (no need for ref with this cpu)

Future: add mosfet to get rid of jumpers on 4-20ma

TBD: Code: disable relays when power is going down

Future: move debug header so you can program with the case closed

T3-8IN-13RELAY_REV05

T3-8IN-13RELAY_REV06

No notes

T3-8IN-13RELAY_REV07

TBD?: add jumpers for aos

TBD?: move aos to top board

TBD?: delete some relays

TBD?: tie two inputs to comparators to use as high speed counters?

TBD: check voltage of ao mux

TBD: add jumpers for ai's

TBD: use isolate module of OR485 replace with current circuit.

T3-8IN-13RELAY_REV08

DONE: change 74HC4052 footprint

DONE: add 3.3v on 74HC4052

DONE: change 5v on chip ULN2803

DONE: change R25,R26,R32,R33's value to 6.19k

T3-4AO REV11

Done: 2A relays

Done: AOs, new protection method

Done: RS485 protection updated

Done: use PIC for feedback on AOs

Done: use PIC for relays

Larger silk screen for jumpers

TBD: change 5V chip, using 400ma

T3-4AO REV12

Done: move ANALOGGND tie point near cpu, change to 0 ohm resistor
Done: move input GND terminals to top board so we can do custom input modules

Done: Harden RS485, Input and analog outputs with ideas from Spring

T3-4AO REV13

Done: change the R12 connect after D3
Done: change the R10 footprint

Rev14

```
DONE: add the 3V VREF CHIP
DONE: MOVE the terminal to the proper placement
DONE: add the 5v missing net.
DONE: add an cap for each analog input. for test .
```

Rev15

```
done: change the MOD module and DI module all 20K resitance to 22
done: connect the 3v vref chip ground to the other ground.
done: connect the 3v vref chip ground to the other ground.
done: delete the jumper select 3.3v or 3v on the top board.
done: change the jumper slikscreen for 4-20ma.
```

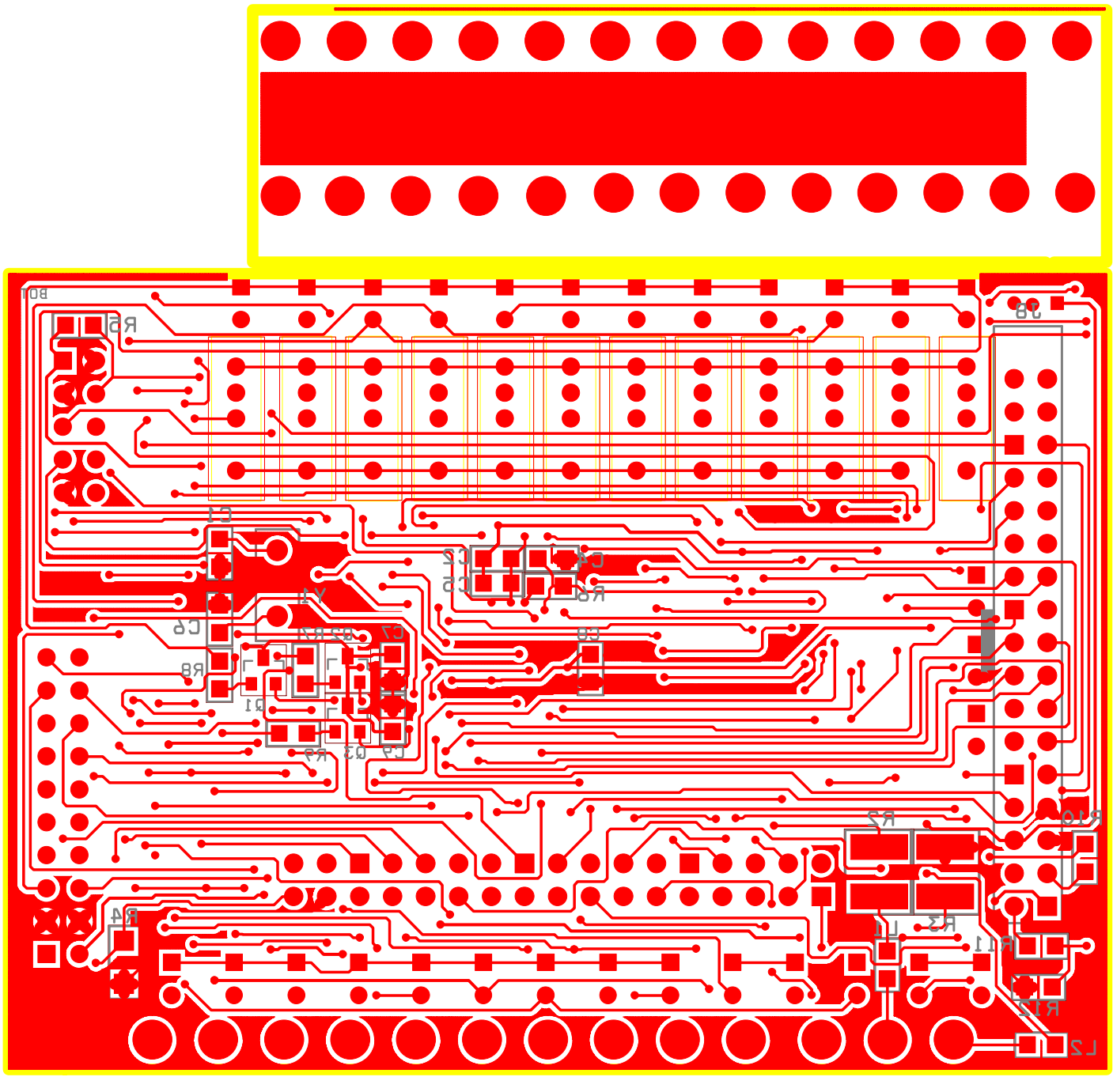
Rev16

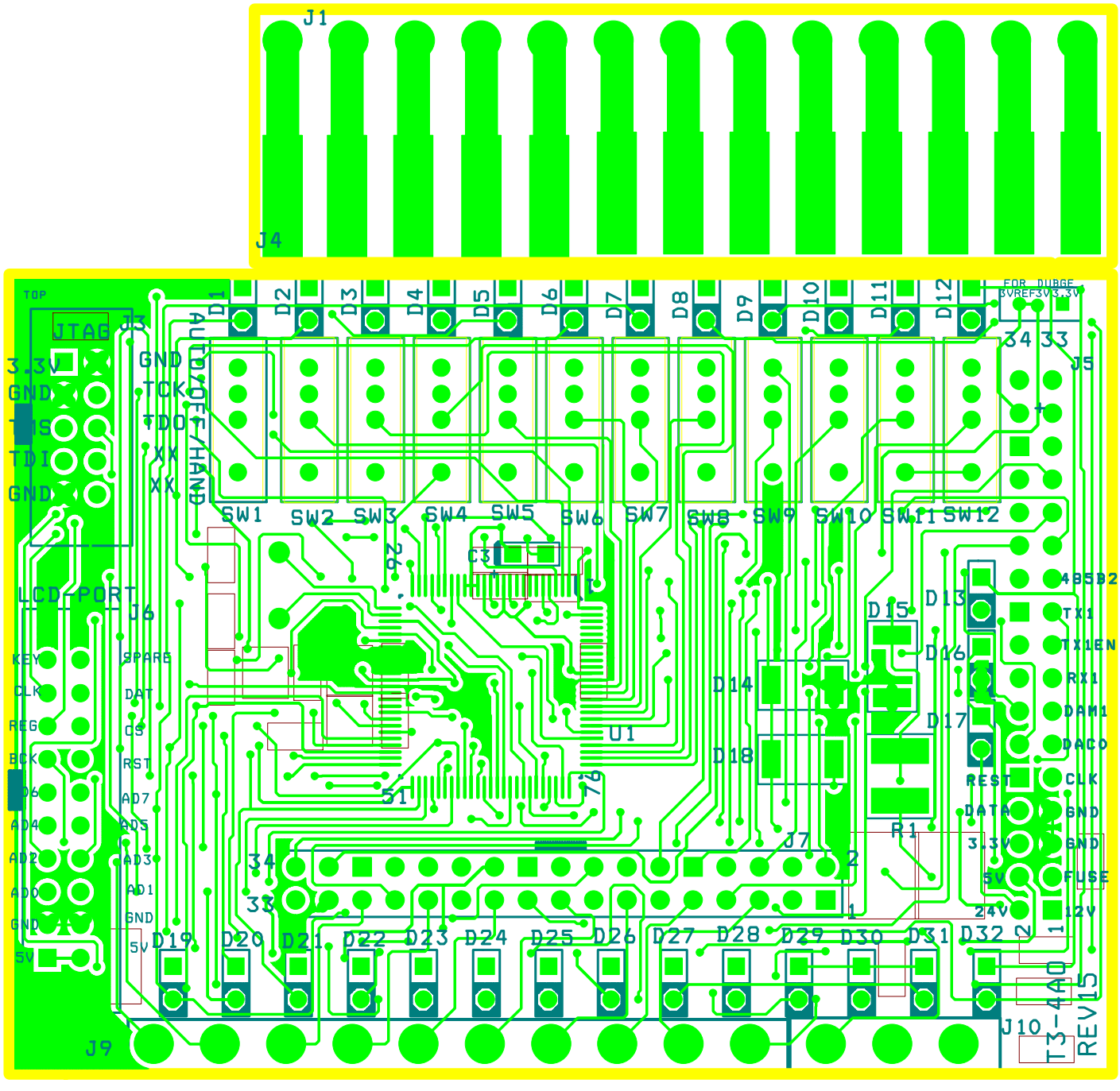
```
TBD: Try to fit 220VAC relays
TBD: Upper PCB is too wide.
TBD: Move top screws inward 1mm
```

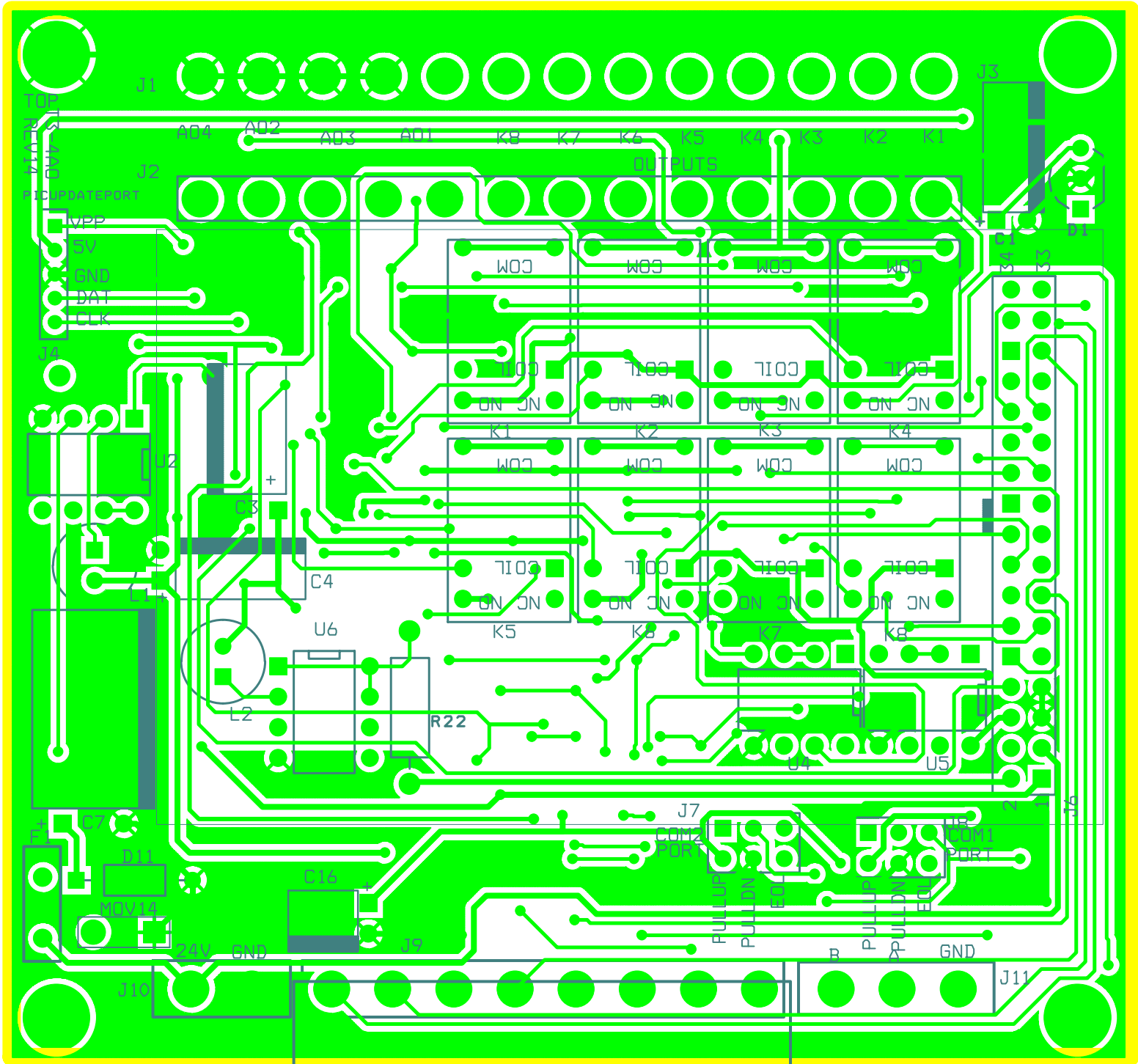
Title: <Title>		
Size: B	Document Number: <Doc>	Rev: <RevCode>
Date: Wednesday, March 14, 2012	Sheet 1 of 5	

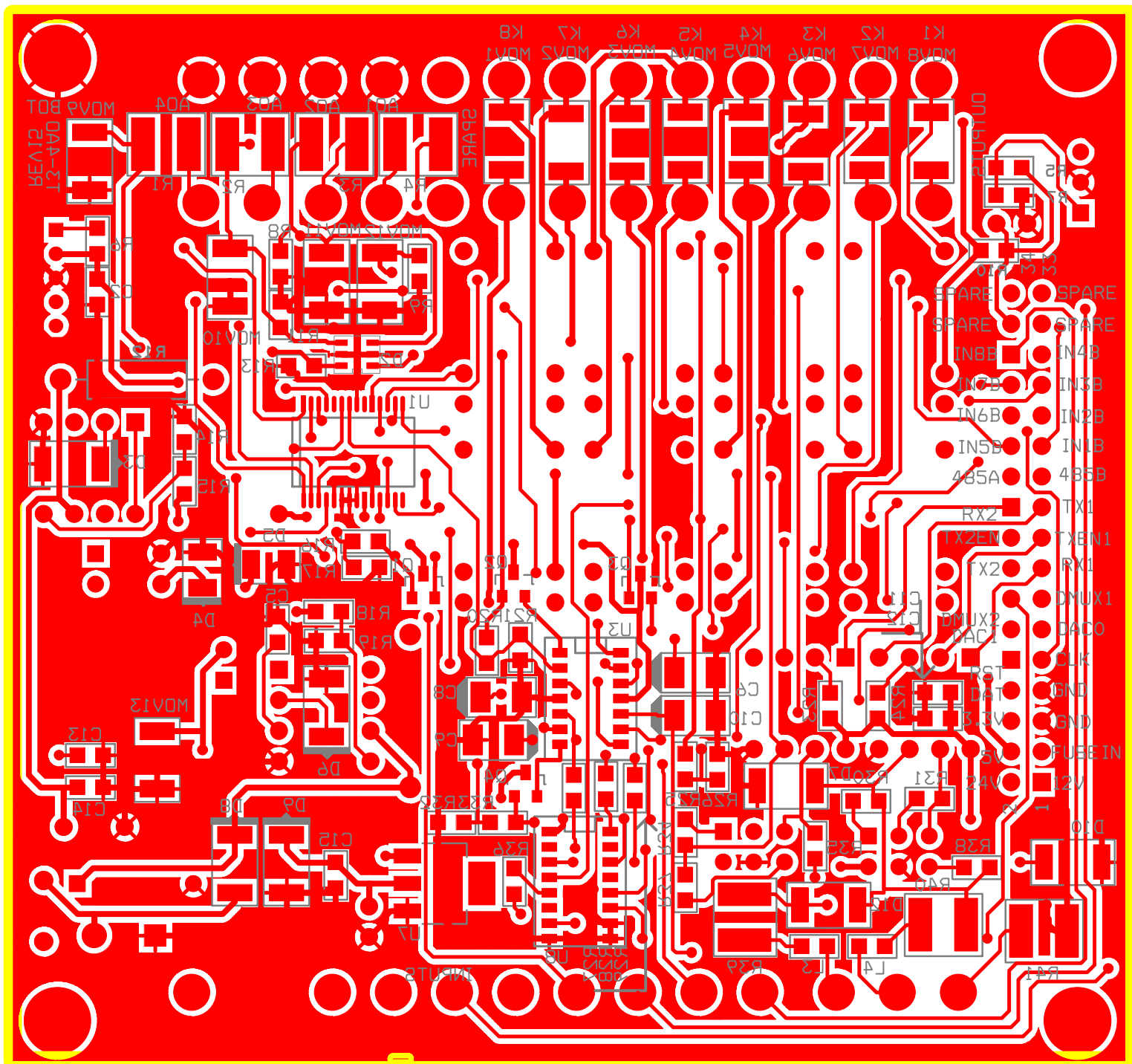
T3-4AOMOD_REV15
AI1
AI2
AI3
AI4
AI5
AI6
AI7
AI8
AI9
AI10
+5V
AF6
AF7
AF8
GND
+3.3V
AF1
AF2
AF3
AF4
AF5
1
2
33
34
0-10V
4-20MA
THERM
0-3V
JUMPERS

BOT
T3-4A0M0D_REV15




J1
J4
TOP
JTAG
J3
3.3V
GND
TMS
TDI
GND
GND
TCK
TDO
XX
XX
AUDIO/CF/HAND
D1
D2
D3
D4
D5
D6
D7
D8
D9
D10
D11
D12
FOR DUBGE
3VREF
3V3.3V
J4
J3
J5
SW1
SW2
SW3
SW4
SW5
SW6
SW7
SW8
SW9
SW10
SW11
SW12
C3
LCD PORT
J6
KEY
CLK
REG
BCK
AD6
AD4
AD2
AD0
GND
5V
SPARE
DAT
CS
RST
AD7
AD5
AD3
AD1
GND
5V
U1
D13
D15
D16
D14
D17
D18
R1
J7
485D2
TX1
TX1EN
RX1
DAM1
DAC0
CLK
GND
GND
FUSE
12V
REST
DATA
3.3V
5V
24V
D19
D20
D21
D22
D23
D24
D25
D26
D27
D28
D29
D30
D31
D32
J9
J10
T3-4A01
REV15


TOP
J1
J3
J2
OUTPUTS
PICUPDATEPORT
VPP
5V
GND
DAT
CLK
J4
K1
K2
K3
K4
K5
K8
K7
K6
C1
D1
C3
C4
U2
L2
U6
L2
R22
U4
U5
J7
COM2
PORT
COM1
PORT
C7
F1
D11
MOV14
C16
24V
GND
J9
J10
J11
GND


SPARE
SPARE
IN8B
IN7B
IN6B
IN5B
485A
RX2
TX2EN
TX2
DMUX2
DAC1
RST
DAT
3.3V
5V
24V
SPARE
SPARE
IN4B
IN3B
IN2B
IN1B
485B
TX1
TXEN1
RX1
DMUX1
DAC0
CLK
GND
GND
FUSEIN
12V

T3-4AO-TOP-REV14 Bill Of Materials August 07,2011				
Item	**Quantity**	**Reference**	**Part**	**Footprint**
1	2	C1,C6	30pF 50V	SM/C_0805
2	1	C4	1uF 50V	SM/C_0805
3	6	C2,C3,C5,C7,C8,C9	0.1UF 50V	SM/C_0805
4	28	D1,D2,D3,D4,D5,D6,D7,D8,D9,D10,D11,D12,D13,D19,D20,D21,D22,D23,D24,D25,D26,D27,D28,D29,D30,D31,D32,D17	LED	LED_RECT
5	3	D14,D15,D18	SMBJ10CA	SM/MOV40V
6	1	D16	LED_GRN	LED_RECT
7	1	J1	CON14	SIP/TM/L1.400/14
8	1	J2	ETB9INCH	ETB8INCH_4
9	1	J3	CON10A	SIP5X2
10	1	J4	CON5	ETB5INCH_2
11	1	J5	CON2x10_SHR0UDED	SIP/TM/L2.000/20
12	1	J6	CON34A	BLKCON.100/VH/TM2OE/W
13	1	J7	CON40A	BOARD_T3_TOP
14	1	J8	ETB8INCH, 90DEG	ETB10INCH
15	1	J9	CON3	ETB3INCH
16	1	J23	CON2	SIP3
17	2	L1,L2	FBEAD/10UH	SM/C_0805
18	3	Q1,Q2,Q3	2N2907	SM/SOT23_123
19	3	R1,R2,R3	1812L010	SM/C_1825
20	1	R4	0R SMT1206	SM/R_1206
21	1	R5	4.7K	SM/R_0805
22	3	R6,R12,R10	10K	SM/R_0805
23	3	R7,R8,R9	50	SM/R_0805
24	1	R11	100K	SM/R_0805
25	12	SW1,SW2,SW3,SW4,SW5,SW6,SW7,SW8,SW9,SW10,SW11,SW12	DP3T,10mm	SWSLIDESP3TC_NO_POSTHOLE
26	1	U1	C8051F120 12BIT	QUAD.50M/100/WG
27	1	Y1	11.0592 Mhz	XTAL1

注:J4靠灯两个孔要短接.

T3-4AO-BOT -REV14 Bill Of Materials AUGUST 08 ,2011				
Item	**Quantity**	**Reference**	**Part**	**Footprint**
1	2	C1,C3	16V 330UF	CPCYLHORIZ/D.200/LS.100
2	3	C2,C11,C12,C14,C15	0.1UF\50V	SM/C_0805
3	1	C4,C16	100uF 25V	CPCYLHORIZ/D.200/LS.100/.034
4	1	C5,C13	220pF	SM/C_0805
5	4	C6,C8,C9,C10	10UF	SM/C_1210_TANT
6	1	C7	50V 330uF X7R	CPCYLHORIZ/D.400/LS.200
7	1	D1	TL431BCLPRMG	TO92/100
8	1	D2	BZA418A	SM/SOT457
9	2	D3,D6	1N5819	SM/D_MLL41_21
10	1	D4,D5	1N4745 15V	SM/D_1206_21_2
11	3	D7,D10,D12	SMBJ15CA	SM/MOV40V
12	1	D8	1N4007	SM/D_MLL41_21
13	1	D9	1N4735 6.2v	SM/D_MLL41_21

14	1	D11	39V zener	DAX1/.450X.100/.034
15	1	F1	LP30-250	FUSE_RUE
16	1	J1	ETB5INCH, 90DEG	ETB5INCH
17	1	J2	CON14	SIP/TM/L1.400/14
18	1	J3	ETB8INCH, 90DEG	ETB8INCH
19	1	J4	SIMP5	SIP/TM/L.500/5_SINGLE
20	1	J5	HOLE	T3CASE2_REV1
21	1	J6	SIP16x2	BOARD_T3_BOT
22	2	J7,J8	2x6 HDR	SIP/TM/L.300/6
23	1	J9	ETB8INCH, 90DEG	ETB8INCH_REV1
24	1	J10	ETB2INCH_90DEG	ETB2INCH
25	1	J11	CON3	ETB3INCH
26	7	K1,K2,K3,K5,K6,K7,K8,K4	N4100CH S 5A DC5VDC0.2W	RELAYHG4100
27	1	L1	330uh 06081A	CYL/D.275/LS.100/.034
28	1	L2	100uh 07091A	CYL/D.275/LS.100/.034
29	2	L3,L4	10uH	SM/C_0805
30	8	MOV1,MOV2,MOV3,MOV4, MOV5,MOV6,MOV7,MOV8	SMBJ170CA	SM/MOV40V
31	5	MOV9,MOV10,MOV11,MOV 12,	SMAJ13CA	SM/MOV40V
32	1	MOV14	47VDK07	CPAX/MOV.100/LS.200/.031
33	4	Q1,Q2,Q3,Q4	2N2222	SM/SOT23_213
34	7	R1,R2,R3,R4,R39,R40,R41	PTC1812L010	SM/C_1825
35	2	R5,R10	1K 1%	SM/R_0805
36	5	R6,R27,R28,R29,R36	2K 1%	SM/R_0805
37	1	R7	5K 1%	SM/R_0805
38	4	R8,R9,R11,R13	1M 5%	SM/R_0805
39	2	R12,R22	0.5 ohm, 1/2W	AX/.500X.125/.034
40	1	R14	1.96K 1%	SM/R_0805
41	1	R15	5.9K -1%	SM/R_0805
42	4	R16,R20,R25,R33	2.32K	SM/R_0805
43	4	R17,R21,R26,R32	1K	SM/R_0805
44	1	R18	20K -1%	SM/R_0805
45	1	R19	2.2k-1%	SM/R_0805
46	2	R23,R24	10K-1%	SM/R_0805
47	4	R30,R31,R34,R35	3.9k - 5%	SM/R_0805
48	2	R37,R38	120R_5%	SM/R_0805
49	1	U1	12F882	SOG.025/28/WG.420/L.400
50	2	U2,U6	MC34063A/SO	DIP.100/8/W.300/L.400
51	1	U3	LM324MX	14SOP150
52	2	U4,U5	SN75HVD12_3V	DIP.100/8/W.300/L.400
53	1	U7	LM1117_3.3v	SM/SOT223_1234
54	1	U8	4052	16SOP150

T3-4AO-MOD-REV14 Bill Of Materials August 07,2011

Item	Quantity	Reference	Part	Footprint
1	10	J1,J2,J3,J4,J5,J6,J7,J8,J9,J 10	CON5	SIP/TM/L.500
2	1	J11	CON34A	BLKCON.100
3	4	R1,R8,R11,R18,R17	10K 4P1%	SM/R_1608
4	9	R2,R3,R5,R6,R10,R12,R13, R15,R16,R9	150-1% 1/2W Thru	AX/.400X.125/.040
5	3	R4,R7,R14	24K 4P1%	SM/R_1608
6	1	U1	LM358	8SOP150
7	2	U2,U3	LM324MX	14SOP150

T3-4AO-DI-REV14 Bill Of Materials August 07,2011				
Item	**Quantity**	**Reference**	**Part**	**Footprint**
1	12	1,C12,C13,C14,C15	0.1uF	SM/C_0805
2	4	D1,D2,D3,D4	1N4148	SM/D_1206_12
3	1	D5	BZX84C15TS-7-F	SM/R_1608_NET4
4	6	J1,J2,J3,J4,J5,J6	CON5	SIP/TM/L.500/5_SINGLE
5	1	J7	CON34A	BLKCON.100/VH/TM2O
6	4	R1,R2,R3,R15	1k	SM/R_0805
7	6	R4,R6,R8,R10,R11,R13	150R1% 1/2W SMT	AX/.400X.125/.040
8	2	R5,R9	24K 4P1%	SM/R_1608_NET4
9	8	R7,R12,R14,R16,R17,R18,R21,R20	10K 4P1%	SM/R_1608_NET4
10	1	R19	2K	
11	4	U1,U2,U3,U4	PC817	DIPSLIDE_2
12	1	U5	LM358	8SOP150
13	2	U6,U7	LM324MX	14SOP150

备注:DI 板子D1 D2 D3 D4 ,封装带尖角的那端是正极,