Power

VSEL — Select logic voltage
1–2 = Autoselect by IOREF
2–3 = 5V

Note: On R3 compatible Arduinos, IOREF will supply 3.3V (Due), or 5V (Mega).

If IOREF is not provided (non–R3) then it must be a 5V Arduino so set VSEL to 5V.

If not 5V then need to get 3.3V from somewhere ...

VSEL
JP101

+V_LOGIC
PWR_FLAG

SHIELD101

SCL1   SCL1
SDA1   SDA1

AREF   AREF
GND3   GND3

+5V   +3.3V

IOREF   IORF   IOREF   D13   13   LED
+5V   +3.3V   D12   12   PS-ON
RESET   RST   RST   D11   11   FET4   D10
3V3   3V3   D10   10   FET1   D10
PWR_FLAG   PWR_FLAG   5V   5V   D9   9   FET2   D9
GND1   GND1   D8   8   FET3   D8
GND2   GND2
AM-VIN   V_IN   V_IN   D7   7   SERVO1
D6   6   SERVO2
THERM0   AD0   AD0   D5   5   SERVO3
THERM1   AD1   AD1   D4   4   SERVO4
THERM2   AD2   AD2   D3   3   E0_STEP
THERM3   AD3   AD3   D2   2   E0_DIR
A4   AD4   AD4   Arduino   D1-TX0   1   UART_TX_LVC
A5   AD5   AD5   D0-RX0   0   UART_RX_LVC
A6   AD6   AD6
A7   AD7   AD7   MEGA/Due   D14-TX3   14   E0_EN
AD8   AD8   D15-RX3   15   E1_DIR
X/Y/Z pins   AD9   AD9   D16-TX2   16   E1_STEP
on one port   AD10   AD10   D17-RX2   17   E1_EN
X_DIR   AD11   AD11   D18-TX1   18
X_STEP   DAC0-AD12   AD12   D19-RX1   19
Y_DIR   DAC1-AD13   AD13   D20-SDA   20   SDA
Y_STEP   AD14   AD14   D21-SCL   21   SCL
Z_DIR   AD15   AD15
Z_STEP

ARDUINO_DUE_SHIELD

GND4   GND4   5V_4   5V_4   5V_4
GND5   GND5   5V_5   5V_5   5V_5

D53   53   D53-SS
52   D52-SCK   D22   22   X-MIN
D51   51   D51-MOSI   D23   23   D23
50   D50-MISO   D24   24   Y-MIN
D25   25   D25
D49   49   D49   D26   26   Z-MIN
48   D48   D27   27   D27
X_EN   47   D47   D28   28   E2_EN
46   D46   D29   29   D29
Y_EN   45   D45   D30   30   X-MAX
44   D44   D31   31   D31
Z_EN   43   D43   D32   32   Y-MAX
42   D42   D33   33   D33
D41   41   D41   D34   34   Z-MAX
40   D40   D35   35   D35
/ESTOP   39   D39   D36   36   E2_DIR
D39   38   D38   D37   37   D37
E2_STEP

P106
MISO   1   2   +5V
3   CONN_3X2   4
SCK   5   6   MOSI

Heatbed Only: 12–24V, 15A

HB_IN   2   HB_IN   1   FUSE 15A   2   +V_HEATBED   PWR_FLAG
P101   F101
1   HB_GND

+5V   P102   VCC   Or 3V3?
+5V   P104   5V   5V standby?

Motors only, 12–24V

MOT_IN   2   MOT_IN   1   FUSE 10A   2   +V_MOTOR   PWR_FLAG   J101
P107   F103
1   MOT_GND

PS-ON   PS-ON   P103

J103
GNDPWR

Extruder heaters, fans,
Due/Mega input
9–15V

POWER_IN   2   P_IN   1   FUSE 10A   2   +V_POWER   PWR_FLAG   D103   AM-VIN   PWR_FLAG
P108   F102
1   D102   C101   C102   1N4004
1N4004   100u   100n   PWR_FLAG

GNDPWR

12V-AUX   1   P_IN
P105
2   VCC   +V_LOGIC

GNDPWR

Sheet: Stepper Drivers
File: steppers.sch

Sheet: Stepper Drivers 2
File: steppers2.sch

Sheet: Inputs
File: con_inputs.sch

Sheet: Outputs
File: con_outputs.sch

Sheet: Misc Connectors
File: con_misc.sch

LED
R101   1k
LED GRN   D101
LED

RESET
SW_PUSH   SW101
Reset

M101
OSHW_logo_2
LOGO_OSHW

Bob Cousins 2013
GPL v3
Derived from RAMPS 1.4 reprap.org/wiki/RAMPS1.4

File: RAMPS-FD.sch
Sheet: /
Title: RAMPS-FD (RAMPS for Arduino Due)
Size: A4   Date: 23 jun 2013   Rev: 0.1
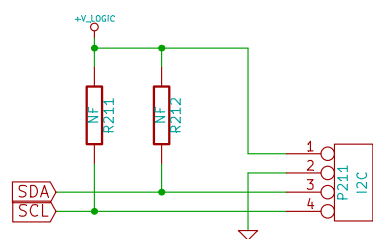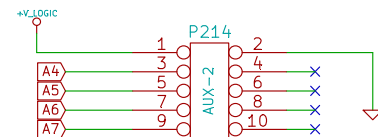KiCad E.D.A. eeschema (2012-01-19 BZR 3256)-stable   Id: 1/6

U206 — E0

+V_LOGIC
10k R216
E0_EN_BUF
+V_MOTOR

Pin	Label		Pin	Label
10	VDD	VMOT	16	
1	ENABLE			
7	STEP	MOT-2B	14	E0-2B
8	DIR	MOT-2A	13	E0-2A
2	MS1	MOT-1A	12	E0-1A
3	MS2	MOT-1B	11	E0-1B
4	MS3			
5	RESET	GNDLOG	9	
6	SLEEP	GNDMOT	15	

E0_STEP
E0_DIR
P208 CONN_3X2 (2,4,6 / 1,3,5)
+V_LOGIC
100k R210
P217 E0-MOT (1,2,3,4)
C206 100u
MOT_GND

U205 — E1

+V_LOGIC
10k R213
E1_EN_BUF
+V_MOTOR

Pin	Label		Pin	Label
10	VDD	VMOT	16	
1	ENABLE			
7	STEP	MOT-2B	14	E1-2B
8	DIR	MOT-2A	13	E1-2A
2	MS1	MOT-1A	12	E1-1A
3	MS2	MOT-1B	11	E1-1B
4	MS3			
5	RESET	GNDLOG	9	
6	SLEEP	GNDMOT	15	

E1_STEP
E1_DIR
P209 CONN_3X2 (2,4,6 / 1,3,5)
+V_LOGIC
100k R208
P212 E1-MOT (1,2,3,4)
C205 100u
MOT_GND

U204 — E2

+V_LOGIC
10k R209
E2_EN_BUF
+V_MOTOR

Pin	Label		Pin	Label
10	VDD	VMOT	16	
1	ENABLE			
7	STEP	MOT-2B	14	E2-2B
8	DIR	MOT-2A	13	E2-2A
2	MS1	MOT-1A	12	E2-1A
3	MS2	MOT-1B	11	E2-1B
4	MS3			
5	RESET	GNDLOG	9	
6	SLEEP	GNDMOT	15	

E2_STEP
E2_DIR
P207 CONN_3X2 (2,4,6 / 1,3,5)
+V_LOGIC
100k R207
P210 E2-MOT (1,2,3,4)
C204 100u
MOT_GND

Title: RAMPS−FS RAMPS for Due

Size: A4	Date: 23 jun 2013		Rev: 0.1
KiCad E.D.A. eeschema (2012−01−19 BZR 3256)−stable		Id: 3/6	

Aux connectors

Should these be 5V?

+V_LOGIC

P215

1 2 D49
MISO 3 4 MOSI
SCK 5 6 D53
7 8 ✕

AUX-3

Aux3-SPI

+V_LOGIC

P214

1 2 ✕
A4 3 4 ✕
A5 5 6 ✕
A6 7 8 ✕
A7 9 10 ✕

AUX-2

Aux2 — spare ADC inputs

+V_LOGIC

TTL 3V3 or 5V
compatible

1
2
UART_TX 3
UART_RX 4

P216 SERIAL

UART-TTL

+V_LOGIC

NF R211   NF R212

SDA
SCL

1
2
3
4

P211 I2C
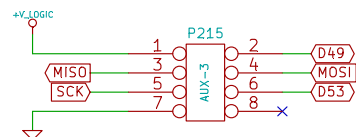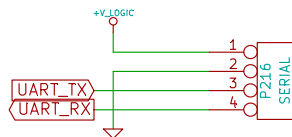
I2C

1k5 Pull ups on Due

Must not have external pullups to 5V

+V_LOGIC

D23 18
D25 17
D27 16
D29 15
D31 14
D33 13
D35 12
D37 11
D39 10
D41 9
D43 8
D45 7
D47 6
5
✕ 4
D51 3
✕ 2
1

P213 AUX-4

+V_LOGIC

Aux4 — general IO

+5V
SERVO1 3
2
1
K201 SER1

+5V
SERVO2 3
2
1
K202 SER2

+5V
SERVO3 3
2
1
K203 SER3

+5V
SERVO4 3
2
1
K204 SER4
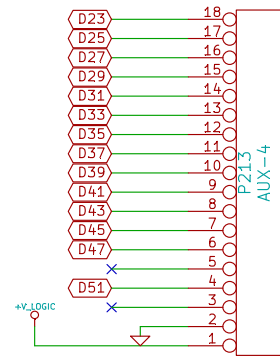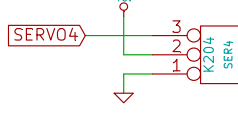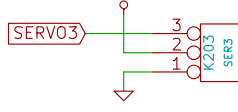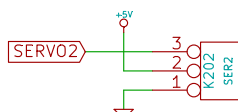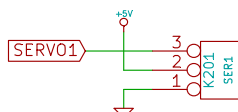
Servos

Need buffered outputs?

A
B
C

1   2   3   4   5

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Sheet: /Misc Connectors/
Title:
Size: A4   Date: 23 jun 2013   Rev:
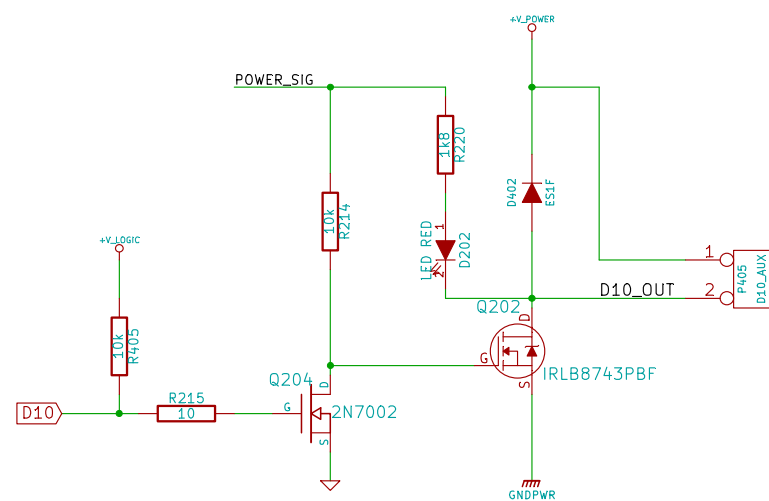KiCad E.D.A. eeschema (2012-01-19 BZR 3256)-stable   Id: 4/6
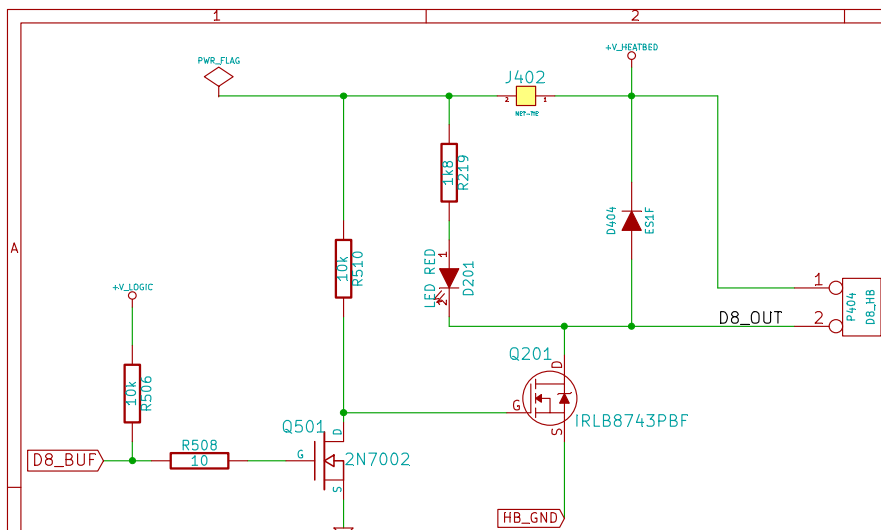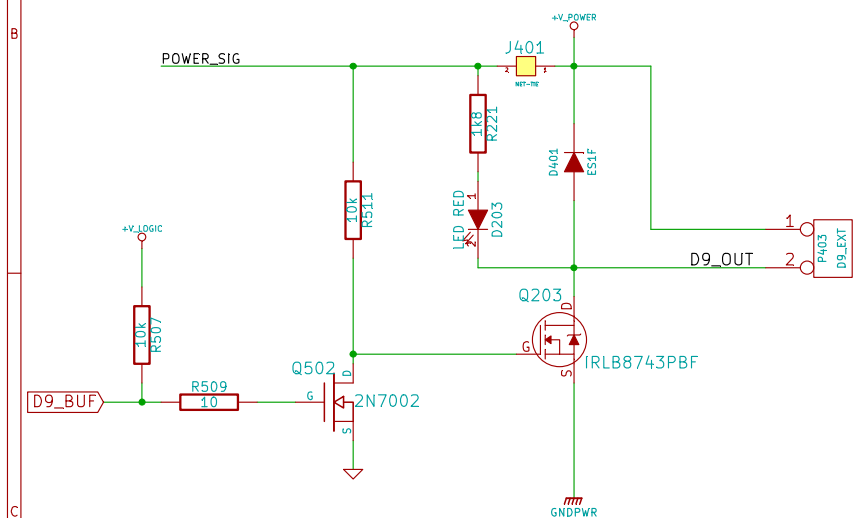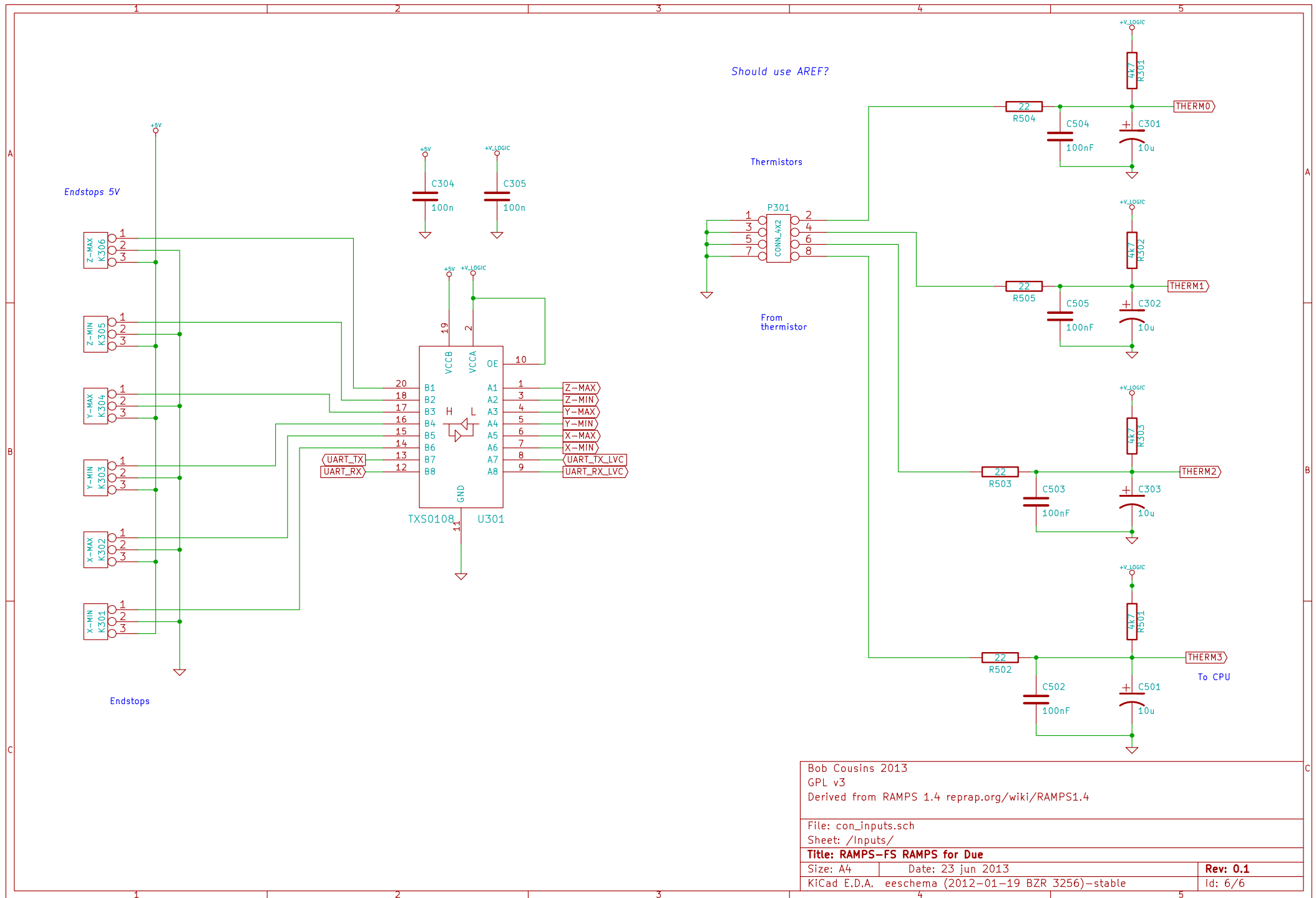
MOSFET Outputs

NB: inverting drivers

D8 — Heatbed

FET4 — Extruder 3 / Fan

D9 — Extruder 1

D10 — Extruder 2 / Fan

Should use AREF?

Endstops 5V

Thermistors

From
thermistor

Endstops

To CPU

TXS0108 U301

Z-MAX K306
Z-MIN K305
Y-MAX K304
Y-MIN K303
X-MAX K302
X-MIN K301

VCCB VCCA OE
B1   A1   Z-MAX
B2   A2   Z-MIN
B3   A3   Y-MAX
B4   A4   Y-MIN
B5   A5   X-MAX
B6   A6   X-MIN
B7   A7   UART_TX_LVC
B8   A8   UART_RX_LVC
GND

UART_TX
UART_RX

C304 100n
C305 100n

P301 CONN_4X2

R301 4K7
R504 22
C504 100nF
C301 10u
THERM0

R302 4K7
R505 22
C505 100nF
C302 10u
THERM1

R303 4K7
R503 22
C503 100nF
C303 10u
THERM2

R501 4K7
R502 22
C502 100nF
C501 10u
THERM3