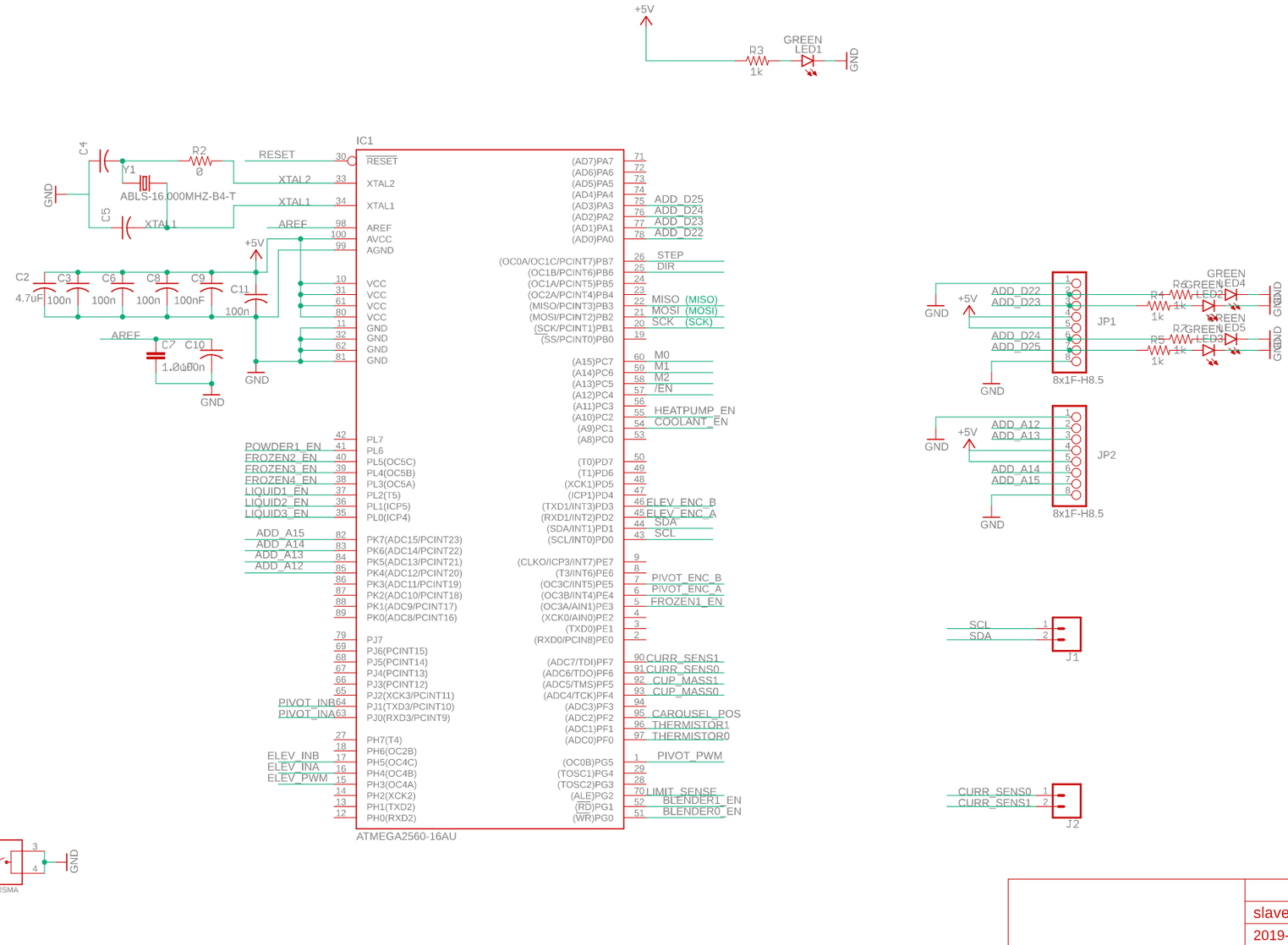
Notes:
mounting holes
need filter on current sense output?
elevator extend copper (GND return path is bad)



slave_board	
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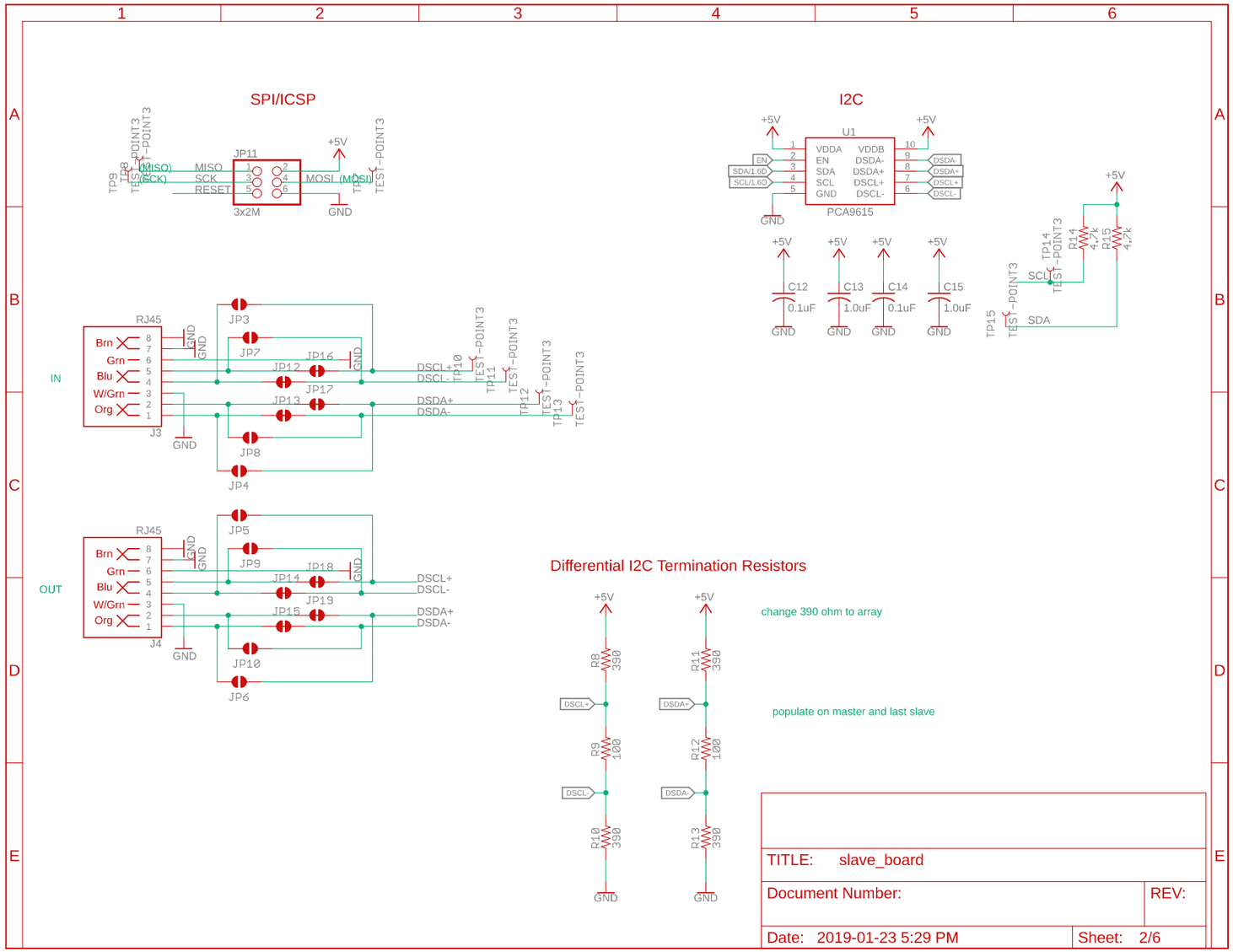
SPI/ICSP
JP11
3x2M
MISO
SCK
RESET
MOSI
(MISO)
(SCK)
(MOSI)
+5V
GND
TP9
TP8
TP7
TEST-POINT3
I2C
U1
PCA9615
VDDA
EN
SDA
SCL
GND
VDDB
DSDA-
DSDA+
DSCL+
DSCL-
SDA/1.6D
SCL/1.6D
C12
C13
C14
C15
0.1uF
1.0uF
R14
R15
4.7k
TP14
TP15
SCL
SDA
RJ45
J3
J4
IN
OUT
Brn
Grn
Blu
W/Grn
Org
JP3
JP4
JP5
JP6
JP7
JP8
JP9
JP10
JP12
JP13
JP14
JP15
JP16
JP17
JP18
JP19
TP10
TP11
TP12
TP13
Differential I2C Termination Resistors
R8
R9
R10
R11
R12
R13
390
100
change 390 ohm to array
populate on master and last slave
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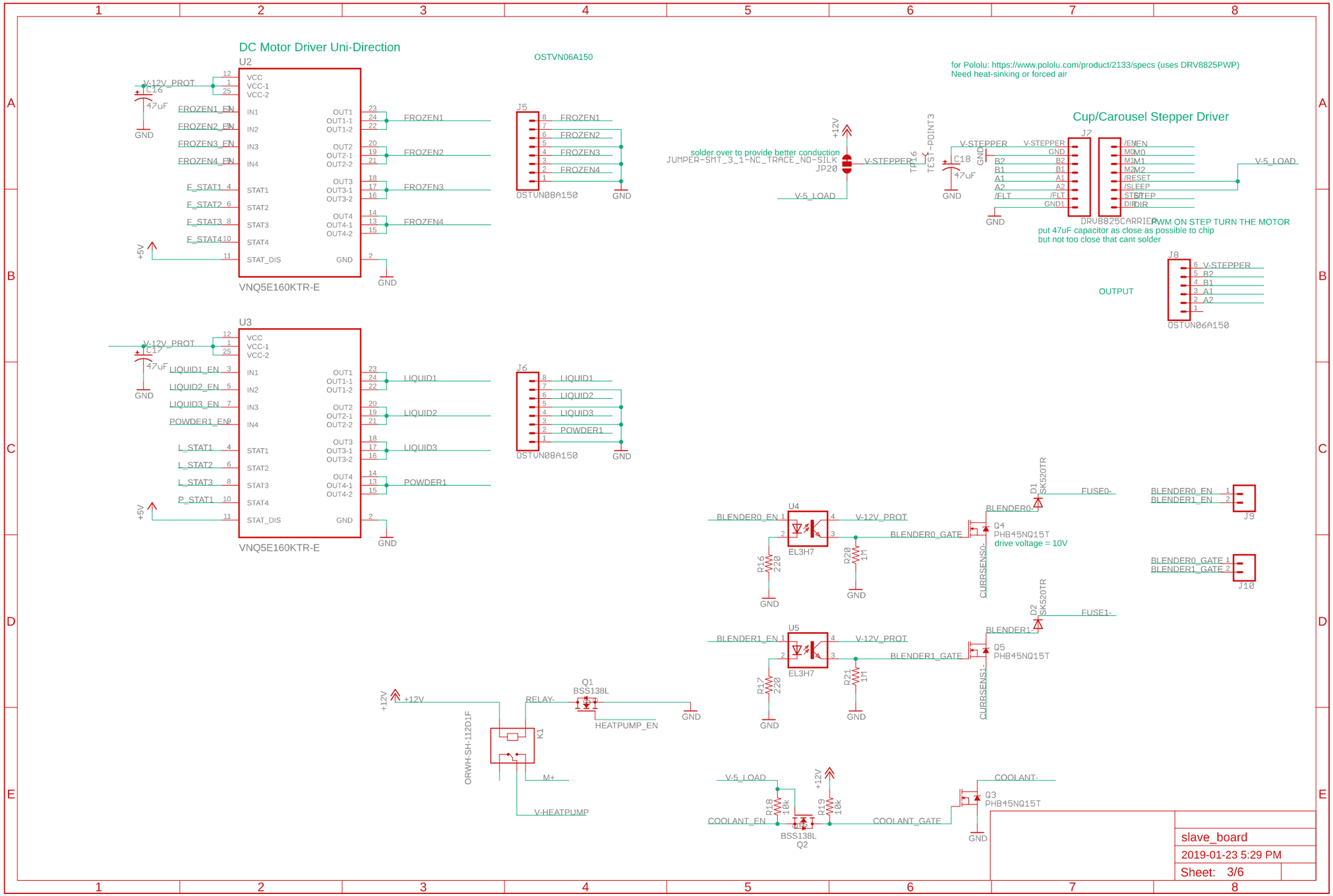
DC Motor Driver Uni-Direction
U2
VNQ5E160KTR-E
V-12V_PROT
C16
47uF
GND
FROZEN1_EN
FROZEN2_EN
FROZEN3_EN
FROZEN4_EN
F_STAT1
F_STAT2
F_STAT3
F_STAT4
+5V
VCC
VCC-1
VCC-2
IN1
IN2
IN3
IN4
STAT1
STAT2
STAT3
STAT4
STAT_DIS
OUT1
OUT1-1
OUT1-2
OUT2
OUT2-1
OUT2-2
OUT3
OUT3-1
OUT3-2
OUT4
OUT4-1
OUT4-2
FROZEN1
FROZEN2
FROZEN3
FROZEN4
OSTVN06A150
J5
OSTVN08A150
U3
VNQ5E160KTR-E
LIQUID1_EN
LIQUID2_EN
LIQUID3_EN
POWDER1_EN
L_STAT1
L_STAT2
L_STAT3
P_STAT1
LIQUID1
LIQUID2
LIQUID3
POWDER1
J6
for Pololu: https://www.pololu.com/product/2133/specs (uses DRV8825PWP)
Need heat-sinking or forced air
solder over to provide better conduction
JUMPER-SMT_3_1-NC_TRACE_NO-SILK
JP20
+12V
V-STEPPER
TP16
TEST-POINT3
C18
47uF
V-5_LOAD
Cup/Carousel Stepper Driver
J7
DRV8825CARRIER
/EN
M0
M1
M2
/RESET
/SLEEP
STEP
DIR
B2
B1
A1
A2
/FLT
GND1
PWM ON STEP TURN THE MOTOR
put 47uF capacitor as close as possible to chip
but not too close that cant solder
OUTPUT
J8
OSTVN06A150
U4
EL3H7
BLENDER0_EN
BLENDER0_GATE
R16
220
R20
1M
D1
SK520TR
FUSE0-
BLENDER0-
Q4
PHB45NQ15T
drive voltage = 10V
CURRSENS0-
J9
J10
U5
BLENDER1_EN
BLENDER1_GATE
R17
220
R21
1M
D2
SK520TR
FUSE1-
BLENDER1-
Q5
PHB45NQ15T
CURRSENS1-
Q1
BSS138L
RELAY-
HEATPUMP_EN
K1
ORWH-SH-112D1F
M+
V-HEATPUMP
R18
10k
R19
10k
COOLANT_EN
COOLANT_GATE
BSS138L
Q2
COOLANT-
Q3
PHB45NQ15T
slave_board
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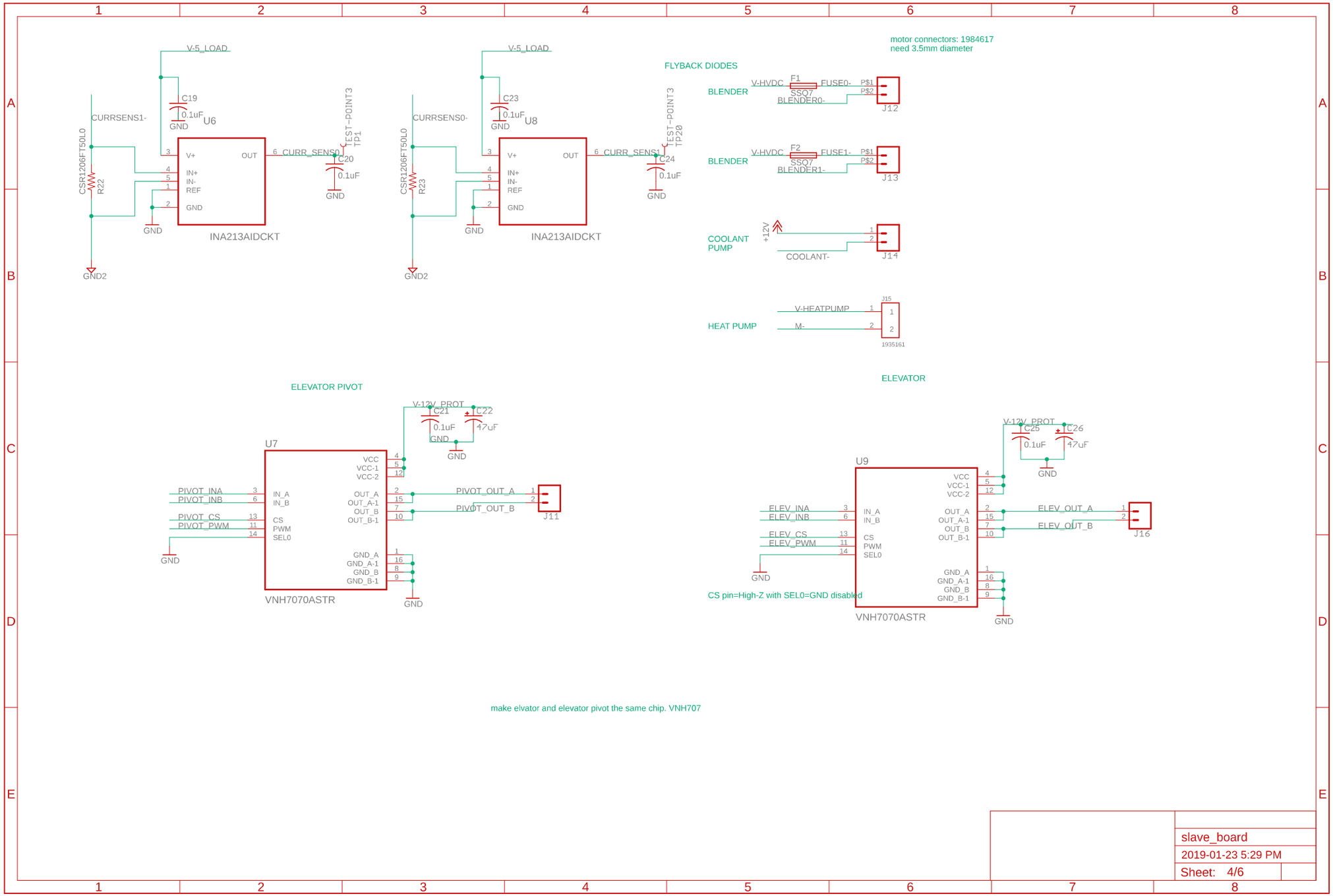
V-5_LOAD
C19
0.1uF
GND
U6
CURRSENS1-
CSR1206FT50L0
R22
V+
OUT
IN+
IN-
REF
GND
INA213AIDCKT
CURR_SENS0
TEST-POINT3
TP1
C20
0.1uF
GND2
V-5_LOAD
C23
0.1uF
GND
U8
CURRSENS0-
CSR1206FT50L0
R23
CURR_SENS1
TEST-POINT3
TP20
C24
0.1uF
INA213AIDCKT
FLYBACK DIODES
motor connectors: 1984617
need 3.5mm diameter
BLENDER
V-HVDC
F1
FUSE0-
SSQ7
BLENDER0-
P$1
P$2
J12
BLENDER
V-HVDC
F2
FUSE1-
SSQ7
BLENDER1-
J13
COOLANT PUMP
+12V
COOLANT-
J14
HEAT PUMP
V-HEATPUMP
M-
J15
1935161
ELEVATOR PIVOT
V-12V_PROT
C21
0.1uF
C22
47uF
GND
U7
VCC
VCC-1
VCC-2
IN_A
IN_B
CS
PWM
SEL0
OUT_A
OUT_A-1
OUT_B
OUT_B-1
GND_A
GND_A-1
GND_B
GND_B-1
PIVOT_INA
PIVOT_INB
PIVOT_CS
PIVOT_PWM
PIVOT_OUT_A
PIVOT_OUT_B
J11
VNH7070ASTR
ELEVATOR
V-12V_PROT
C25
0.1uF
C26
47uF
U9
ELEV_INA
ELEV_INB
ELEV_CS
ELEV_PWM
ELEV_OUT_A
ELEV_OUT_B
J16
CS pin=High-Z with SEL0=GND disabled
VNH7070ASTR
make elvator and elevator pivot the same chip. VNH707
slave_board
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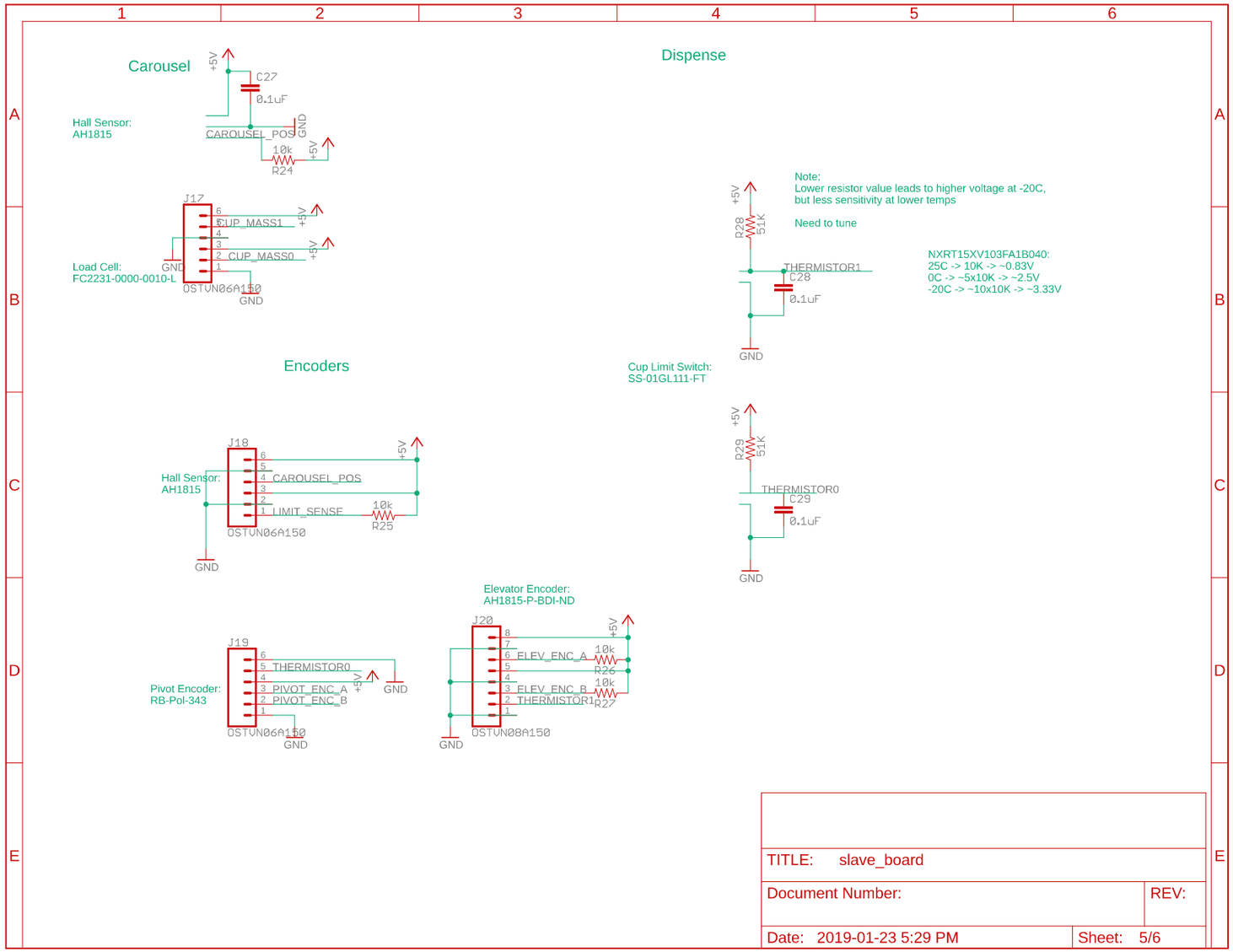

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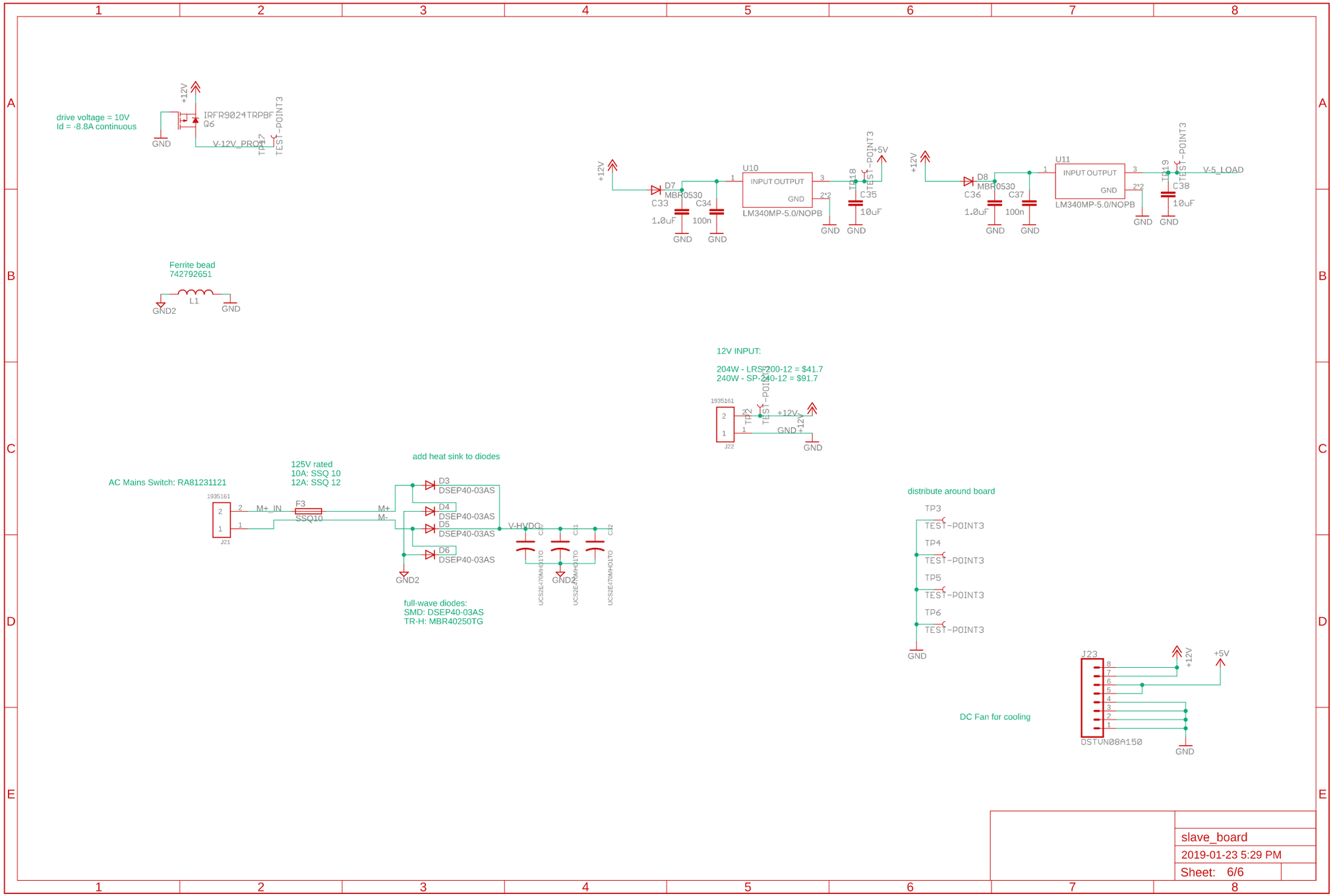
drive voltage = 10V
Id = -8.8A continuous
+12V
IRFR9024TRPBF
Q6
GND
V-12V_PROT
TP17
TEST-POINT3
+12V
D7
MBR0530
C33
1.0uF
C34
100n
GND
GND
U10
INPUT OUTPUT
GND
LM340MP-5.0/NOPB
2*2
TP18
TEST-POINT3
+5V
C35
10uF
GND
GND
+12V
D8
MBR0530
C36
1.0uF
C37
100n
GND
GND
U11
INPUT OUTPUT
GND
LM340MP-5.0/NOPB
2*2
TP19
TEST-POINT3
V-5_LOAD
C38
10uF
GND
GND
Ferrite bead
742792651
L1
GND2
GND
12V INPUT:
204W - LRS-200-12 = $41.7
240W - SP-240-12 = $91.7
1935161
J22
TP2
TEST-POINT3
+12V
GND
+12V
GND
AC Mains Switch: RA81231121
1935161
J21
M+_IN
F3
SSQ10
125V rated
10A: SSQ 10
12A: SSQ 12
M+
M-
add heat sink to diodes
D3
DSEP40-03AS
D4
DSEP40-03AS
D5
DSEP40-03AS
D6
DSEP40-03AS
GND2
V-HVDC
C3
C1
C2
UCS2E470MHD1TO
UCS2E470MHD1TO
UCS2E470MHD1TO
GND2
full-wave diodes:
SMD: DSEP40-03AS
TR-H: MBR40250TG
distribute around board
TP3
TEST-POINT3
TP4
TEST-POINT3
TP5
TEST-POINT3
TP6
TEST-POINT3
GND
J23
+12V
+5V
DC Fan for cooling
DSTUN08A150
GND
slave_board
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